BAY AREA
AIR QUALITY
MANAGEMENT
DISTRICT

SINCE 1955

Octobef 17, 2007

Mr. Bill Pfanner
Project Manager
Californa Energy Commission
1516 9th Street
Sacramento, CA 95814-5512

DOCKET
06-AFC-6
DATE OCT 17 2007
RECD. OCT 23 2007

Re: Eastshore Energy Center
BAAQMD Application 15195

Dear Mr. Pfanner:

This is to advise you that the BAAQMD has issued the Final Determination of Compliance (FDOC) for the proposed Eastshore Energy Center (EEC). The facility would be located at 25101 Clawiter Road in the City of Hayward, Alameda County, in an area zoned for industrial uses. The proposed facility would be a nominal 115.5-MW peaker plant, utilizing fourteen natural-gas fired engine generator sets, and a 367 hp diesel powered emergency standby generator.

The enclosed revised FDOC summarizes how the EEC will comply with applicable District regulations, including BACT and emission offset requirements. The FDOC has satisfied the public notice and 30-day public comment requirements of District Regulations 2-2-405 and 406. A copy of the FDOC is enclosed.

If you have any questions regarding this matter, please contact Brian K. Lusher, Air Quality Engineer II, at (415) 749-4623.

Very truly yours,

BC FOR
Jack P. Broadbent
Executive Officer/APCO

Enclosure
JPB:bkl

PROOF OF SERVICE (REVISED 10/2/07) FILED WITH
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Final
Determination of Compliance

Eastshore Energy Center

Bay Area Air Quality Management District
Application No. 15195
Site No. 18041

October, 2007

Brian K. Lusher
Air Quality Engineer II

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I Background

On September 22, 2006, Eastshore Energy, LLC, a wholly owned subsidiary of Tierra Energy, submitted an Application for Certification (AFC) to construct and operate a simple-cycle (peaking) power plant, the Eastshore Energy Center (Eastshore), in the City of Hayward.

The proposed Eastshore site is located at 25101 Clawiter Road in the City of Hayward, Alameda County, in an area zoned for industrial uses. The proposed facility would be a nominal 118-megawatt (MW) gross (115.5 MW net) simple cycle power plant consisting of 14 Wartsila 20V34SG natural gas-fired reciprocating engine generator sets and associated equipment including an emergency standby generator set (369 HP Diesel Engine). The Eastshore project is designed as a peaking facility to meet electric generation load during periods of high demand, which generally occur during daytime hours and more frequently during the summer than other portions of the year. The project is expected to have an annual capacity factor of approximately 45 percent, depending on weather-related customer demand, load growth, hydroelectric supplies, generating unit retirements and replacements, the level of generating unit and transmission outages, and other factors.

This is the Bay Area Air Quality Management District's (BAAQMD or District) Final Determination of Compliance (FDOC) for the Eastshore Energy Center. Pursuant to District Regulation 2, Rule 3, Section 403, this document presents the District's final determination that the proposed project will comply with applicable federal, state, and BAAQMD regulations, including the Best Available Control Technology (BACT) and emission offset requirements of the District's New Source Review regulation. Proposed permit conditions necessary to insure compliance with applicable rules and regulations and air pollutant emission calculations are also included. This document also includes a health risk screening assessment that evaluates the impact of the project's toxic air contaminant emissions on public health.

The District is issuing this Final Determination of Compliance after input from the public and interested government agencies. In accordance with BAAQMD Regulation 2, Rule 3, Section 404, the Preliminary Determination of Compliance (PDOC) was subject to the public notice, public inspection, and public comment requirements of District Regulation 2, Rule 2, Sections 406 and 407. Notice was given to the public of the availability of this PDOC, and the public had a 30-day comment period from the date of the notice to comment on it. The District has reviewed and considered all comments received from the public and interested government agencies, and has (as appropriate) incorporated comments into this FDOC pursuant to District Regulation 2, Rule 3, Section 405. This FDOC will be submitted to the California Energy Commission (CEC) for use during the certification process for this proposed facility.

This FDOC also serves as the evaluation report for the BAAQMD Authority to Construct application number 15195. The Authority to Construct will be issued when and if the CEC certifies the project.

II Project Description

This section describes the equipment that would be installed at the proposed Eastshore Energy Center, the various operating scenarios that are anticipated, and what strategies and equipment will be used to control air emissions.

A. Permitted Equipment

Eastshore Energy, LLC is proposing a 115.5-MW net, simple cycle power plant consisting of 14 Wartsila 20V34SG natural gas-fired reciprocating engine generator sets and associated equipment including an emergency standby generator set (369 HP Diesel Engine).

The proposed Eastshore Energy Center will consist of the following permitted equipment:

S-1 Natural Gas Fired Turbocharged Engine Generator Set, 8.4 MW (gross), 11,660 HP, Wartsila Model 20V34SG, abated by A-1 Selective Catalytic Reduction System and A-15 Oxidation Catalyst

S-2 Natural Gas Fired Turbocharged Engine Generator Set, 8.4 MW (gross), 11,660 HP, Wartsila Model 20V34SG, abated by A-2 Selective Catalytic Reduction System and A-16 Oxidation Catalyst

S-3 Natural Gas Fired Turbocharged Engine Generator Set, 8.4 MW (gross), 11,660 HP, Wartsila Model 20V34SG, abated by A-3 Selective Catalytic Reduction System and A-17 Oxidation Catalyst

S-4 Natural Gas Fired Turbocharged Engine Generator Set, 8.4 MW (gross), 11,660 HP, Wartsila Model 20V34SG, abated by A-4 Selective Catalytic Reduction System and A-18 Oxidation Catalyst

S-5 Natural Gas Fired Turbocharged Engine Generator Set, 8.4 MW (gross), 11,660 HP, Wartsila Model 20V34SG, abated by A-5 Selective Catalytic Reduction System and A-19 Oxidation Catalyst

S-6 Natural Gas Fired Turbocharged Engine Generator Set, 8.4 MW (gross), 11,660 HP, Wartsila Model 20V34SG, abated by A-6 Selective Catalytic Reduction System and A-20 Oxidation Catalyst

S-7 Natural Gas Fired Turbocharged Engine Generator Set, 8.4 MW (gross), 11,660 HP, Wartsila Model 20V34SG, abated by A-7 Selective Catalytic Reduction System and A-21 Oxidation Catalyst

S-8 Natural Gas Fired Turbocharged Engine Generator Set, 8.4 MW (gross), 11,660 HP, Wartsila Model 20V34SG, abated by A-8 Selective Catalytic Reduction System and A-22 Oxidation Catalyst

S-9 Natural Gas Fired Turbocharged Engine Generator Set, 8.4 MW (gross), 11,660 HP, Wartsila Model 20V34SG, abated by A-9 Selective Catalytic Reduction System and A-23 Oxidation Catalyst

S-10 Natural Gas Fired Turbocharged Engine Generator Set, 8.4 MW (gross), 11,660 HP, Wartsila Model 20V34SG, abated by A-10 Selective Catalytic Reduction System and A-24 Oxidation Catalyst

S-11 Natural Gas Fired Turbocharged Engine Generator Set, 8.4 MW (gross), 11,660 HP, Wartsila Model 20V34SG, abated by A-11 Selective Catalytic Reduction System and A-25 Oxidation Catalyst

S-12 Natural Gas Fired Turbocharged Engine Generator Set, 8.4 MW (gross), 11,660 HP, Wartsila Model 20V34SG, abated by A-12 Selective Catalytic Reduction System and A-26 Oxidation Catalyst

S-13 Natural Gas Fired Turbocharged Engine Generator Set, 8.4 MW (gross), 11,660 HP, Wartsila Model 20V34SG, abated by A-13 Selective Catalytic Reduction System and A-27 Oxidation Catalyst

S-14 Natural Gas Fired Turbocharged Engine Generator Set, 8.4 MW (gross), 11,660 HP, Wartsila Model 20V34SG, abated by A-14 Selective Catalytic Reduction System and A-28 Oxidation Catalyst

S-15 Emergency Standby Generator Set; Diesel Engine; Caterpillar Model C9ATAAC, 369 HP

The proposed Eastshore facility will also include the following equipment that is exempt from District permit requirements:

> Natural Gas Fired Heater to Heat Incoming Natural Gas Feed to all Engine Generator Sets, Max Firing Rate 2.0 MMBtu/hr

The natural gas fired heater is exempt from District permit requirements per Regulation 2, Rule 1, Section 114, which states:

> **2-1-114.1.2 Exemption, Combustion Equipment:** The following equipment is exempt from the requirements of Sections 2-1-301 and 302, only if the source does not emit pollutants other than combustion products, and those combustion products are not caused by the combustion of a pollutant generated from another source, and the source does not require permitting pursuant to Section 2-1-319.
>
> 114.1 Boilers, Heaters, Steam Generators, Duct Burners, and Similar Combustion Equipment:
>
> 1.1 Any of the above equipment with less than 1 million BTU per hour rated heat input.
>
> 1.2 Any of the above equipment with less than 10 million BTU per hour rated heat input if fired exclusively with natural gas (including compressed natural gas), liquefied petroleum gas (e.g. propane, butane, isobutane, propylene, butylenes, and their mixtures), or any combination thereof.

B. Equipment Operating Scenarios

1. 14 Natural Gas Fired Engine Generator Sets

The Eastshore project is designed as a peaking facility to meet electric generation load during periods of high demand, which generally occur during daytime hours and more frequently during the summer than other times of the year. The project is expected to have an annual capacity factor of approximately 45 percent, depending on weather-related customer demand, load growth, hydroelectric supplies, generating unit retirements and replacements, the level of generating unit and transmission outages, and other factors. The following operating scenarios are expected for the facility.

Base Load:	Maximum continuous output
Load Following:	Facility would be operated to meet contractual load and spot sale demand, with a total output less than the base load scenario
Partial Shutdown:	Based upon contractual load and spot sale demand, it may be economically favorable to shutdown one or more engine generator sets; this would occur during periods of low overall demand such as late evening and early morning hours
Full Shutdown:	May be caused by equipment malfunction, fuel supply interruption, or transmission line disconnect or if market price of electricity falls below cost of generation

The following projected operating scenario was utilized to estimate maximum annual air pollutant emissions from the 14 Engine Generator Sets.

- 4,000 hours of operation per year for each engine generator set
- 300 cold start-ups per engine generator set per year (30 minutes/start-up)
- 300 shut downs per engine generator set per year (8.5 minutes/shut down)

2. Emergency Standby Generator Set

The emergency standby diesel generator is intended for emergency use only, as defined by the California Air Resources Board at 17 C.C.R. section 93115(d)(25) (the Airborne Toxics Control Measure for stationary compression ignition engines). Such emergency conditions are not expected to be a common occurrence. In addition, the generator set will have to be operated occasionally on a short-term test basis for testing and in order to ensure operational reliability. This short-term operation will not exceed 50 hours per year.

C. Air Pollution Control Strategies and Equipment

The proposed Eastshore Energy Center includes sources that trigger the requirement to use Best Available Control Technology (BACT) in the District's New Source Review regulation (District Regulation 2, Rule 2, NSR) for emissions of nitrogen oxides (NO_x), carbon monoxide (CO),

precursor organic compounds (POCs), and particulate matter of less than or equal to 10 microns in diameter (PM_{10}).

Recently, particulate matter of less than or equal to 2.5 microns in diameter ($PM_{2.5}$), a subset of PM_{10}, has been the focus of new regulatory efforts including a revised Federal ambient air quality standard. The particulate matter emitted from the large natural gas fired engines is typically less than 1 micron in diameter (see AP-42, Table 3.2-2, 7/00), and may be considered to be both PM_{10} and $PM_{2.5}$. For the purposes of the FDOC, the total particulate matter emissions, PM_{10} emissions and PM2.5 emissions are all equivalent. These emissions are referred to as "$PM_{10}/PM_{2.5}$" in this FDOC.

The control strategies and equipment that are being proposed to comply with BACT are as follows.

1. **Selective Catalytic Reduction with Ammonia (NH_3) Injection for the Control of NO_x Emissions**

Each engine generator set triggers BACT for NO_x emissions. The NO_x emissions from each engine generator set will be abated by selective catalytic reduction (SCR) systems with ammonia (NH_3) injection.

2. **Oxidation Catalyst and Good Combustion Practices for the Control of CO Emissions**

Each engine generator set triggers BACT for CO emissions. The engine generator sets will operate on a lean fuel mixture that minimizes incomplete combustion and CO emissions. The engine generator sets will be abated by oxidation catalysts, which oxidize the CO emissions and produce carbon dioxide (CO_2) and water.

3. **Oxidation Catalyst and Good Combustion Practices for the Control of POC Emissions**

Each engine generator set triggers BACT for POC emissions. The engine generator sets operate on a lean fuel mixture that minimizes incomplete combustion and POC emissions. The engine generator sets will be abated by oxidation catalysts, which also reduce POC emissions.

4. **Exclusive Use of Clean-burning Natural Gas for the Control of SO_2, $PM_{10}/PM_{2.5}$ Emissions**

Each engine generator set triggers BACT for SO_2 and $PM_{10}/PM_{2.5}$. emissions. The engine generator sets will burn exclusively Public Utility Commission (PUC) regulated natural gas and utilize good combustion practices to minimize sulfur dioxide (SO_2), and $PM_{10}/PM_{2.5}$ emissions. Because the SO_2 emission rate is proportional to the sulfur content of the fuel burned and is not dependent upon other combustion characteristics, the use of "low sulfur content" natural gas will result in the lowest possible emission of SO_2.

Table 1: Control Strategies and Emission Limits for Wartsila Engine Generator Sets

	Pollutant				
	NO_x	CO	POC	$PM_{10}/PM_{2.5}$	SO_2
Control Technology	SCR	Oxidation Catalyst	Oxidation Catalyst	PUC-Regulated Natural Gas	PUC-Regulated Natural Gas
Emissions Limit[b]	5 ppmvd	13 ppmvd	25 ppmvd	1.3 lb/hr average, up to 1.9 lb/hr maximum any single engine[a]	0.237 lb/hr

[a]Particulate emission limit is a daily emissions cap on all fourteen engines assuming 1 cold start per engine and 23.5 hours of normal operation at 1.3 lb/hr. Annual particulate limit is an annual emissions cap assuming 300 cold starts/shutdowns per year per engine and 3807.5 hours per year of normal operation per engine at 1.3 lb/hr. The maximum emission rate for any given engine is 1.9 lb/hr.

[b]Concentrations in parts per million by volume dry (ppmvd) of NO_x, CO, and POC corrected to 15% oxygen (O_2) dry basis, and are averaged over a 1-hour period.

5. Use of CARB-Certified Engine and Limitation on Hours of Non-Emergency Use for the Control of Emergency Standby Generator Set Emissions.

The emergency standby generator set triggers BACT for NO_x and CO. The generator set will be limited to 50 hours or less of non-emergency use per year, for testing and reliability purposes only, which will limit the emissions from this source. In addition, the emergency standby generator will be an engine certified by the California Air Resources Board as having air emissions that satisfy the District's BACT requirements.

III Facility Emissions

The facility regulated criteria air pollutant emissions and toxic air contaminant emissions are presented in the following tables. Detailed emission calculations, including the derivations of emission factors, are presented in the appendices.

A. Regulated Criteria Pollutants

Table 2 is a summary of the daily maximum regulated criteria air pollutant emissions for the permitted sources at the proposed Eastshore Energy Center. These emission rates are used to determine if the BACT requirements of the District New Source Review Regulation (NSR; Regulation 2, Rule 2) are triggered on a pollutant-specific basis. Pursuant to Regulation 2-2-301.1, any new source that has the potential to emit 10 pounds or more per highest day of POC, NPOC, NO_x (as nitrogen dioxide, NO_2), SO_2, PM_{10}, or CO is subject to the BACT requirement for that pollutant.

Table 2: Maximum Daily Regulated Criteria Air Pollutant Emissions for Each Proposed Source

Source	Pollutant, (lb/day) for each Engine				
	Nitrogen Oxides (as NO_2)	Carbon Monoxide	Precursor Organic Compounds	$PM_{10}/PM_{2.5}$	Sulfur Dioxide
S-1 through S-14 Natural Gas Fired Engine Generator Set (no startup/shutdown)[a]	31.87	50.43	55.41	31.20	5.68
S-1 through S-14 Natural Gas Fired Engine Generator Set (one startup/shutdown)[b]	40.02	62.60	60.87	47.08	5.68
S-15 Emergency Standby Generator Set[c]	51.18	45.13	2.69	2.18	0.107

[a] All emission rates on this line are based upon 24 hours of Engine Generator Set full load operation. PM-10 is based on 1.3 lb/hour average emission rate.

[b] NO_x (as NO_2), CO, POC, PM_{10}, and $PM_{2.5}$ emission rates on this line are based upon one cold start-up cycle, and 23.5 hours of Engine Generator Set full load operation. SO_2 emission rates on this line are based upon 24 hours of Engine Generator Set full load operation.

[c] Emission rates on this line are based upon 24 hr/day operation at maximum emission rates. This is not a likely operating scenario for the emergency standby generator, but it is the maximum potential emission rate.

Table 3 is a summary of the maximum annual regulated criteria air pollutant emissions for the facility from proposed permitted sources. Pursuant to the Prevention of Significant Deterioration (PSD) requirements of New Source Review (Regulation 2-2-304.1 and 2-2-305.1), a new major facility with maximum annual pollutant emissions in excess of any of the PSD trigger levels shown must perform modeling to assess the net air quality impact of the proposed facility. The emissions from the Eastshore Energy facility are below all PSD Trigger Levels.

Table 3: Maximum Annual Facility Regulated Criteria Air Pollutant Emissions

Pollutant	Permitted Source Emissions[a,b] (tons/year)	PSD Trigger[c] (tons/year)
Nitrogen Oxides (as NO_2)	54.35	100
Carbon Monoxide	84.45	100
Precursor Organic Compounds	76.11	N/A[d]
$PM_{10}/PM_{2.5}$	40.31	100
Sulfur Dioxide	6.63	100

[a]Emission increases from proposed engine generator sets and emergency standby generator set; specified as permit condition limits and does not include emissions from exempt equipment.

[b]Includes start-up and shutdown emissions for proposed engine generator sets.

[c]For a new major facility.

[d]There is no PSD trigger level for POC.

B. Toxic Air Contaminants

Table 4 is a summary of the maximum facility toxic air contaminant (TAC) emissions from new sources. These emissions are used as input data for air pollutant dispersion models used to assess the increased health risk to the public resulting from the project. The ammonia emissions shown are based on an ammonia emission concentration of 10 ppmvd @ 15% O_2 due to ammonia slip from the A-1 through A-14 SCR Systems. The risk screening trigger levels shown are per Regulation 2, Rule 5.

Table 4: Maximum Facility Toxic Air Contaminant (TAC) Emissions

Toxic Air Contaminant	Total Project Emissions[a] (lb/hr)	Acute 1-hr max. Trigger Level (lb/hr)	Total Project Emissions[a] (lb/yr)	Chronic Trigger Level (lb/yr)
1,3-Butadiene	2.20E-01	None	8.70E02	1.10E+00
Acetaldehyde	3.17E-01	None	1.25E03	6.40E+01
Acrolein	3.53E-02	4.2E-04	1.40E02	2.30E+00
Ammonia	1.39E+01	7.1E00	1.10E05	7.70E+03
Benzene	1.31E-01	2.9E00	5.17E02	6.40E+00
Benzo-a-anthracene	3.52E-05	None	1.39E-01	None
Benzo-a-pyrene	1.62E-06	None	6.40E-03	1.10E-02
Benzo-b-fluoranthene	2.45E-05	None	9.7E-02	None
Benzo-k-fluoranthene	4.70E-06	None	1.86E-02	None
Chrysene	8.56E-06	None	3.39E-02	None
Dibenz-ah-anthracene	1.62E-06	None	6.40E-03	None
Ethylbenzene	4.26E-02	None	1.69E02	7.70E+04
Formaldehyde	2.83E+00	2.1E-01	1.12E04	3.00E+01
Indeno-123cd-pyrene	4.30E-06	None	1.70E-02	None
Naphthalene	1.50E-02	None	5.95E01	None
Propylene	3.22E+00	None	1.28E04	1.20E+05
Toluene	1.43E-01	8.2E01	5.67E02	1.20E+04
Xylenes	3.87E-01	4.9E01	1.53E03	2.70E+04
Diesel Exhaust Particulate	9.10E-02	None	2.23E00	5.80E-01

[a]Total combined emissions for S-1 through S-14 Engine Generator Sets, and S-15 Emergency Standby Generator Set, Diesel Engine. In accordance with the Office of Environmental Health Hazard Assessment, Cal EPA, *Air Toxics Hot Spots Program Risk Assessment Guidelines* (August, 2003), diesel particulate matter is used as a surrogate for whole diesel exhaust and is the basis for the potential risk calculations.

IV Statement of Compliance

The following section summarizes the applicable District Rules and Regulations and describes how the proposed Eastshore Energy Center will comply with those requirements.

A. Regulation 2, Rule 2: New Source Review

The primary requirements of the District's New Source Review rule that may apply to the proposed Eastshore Energy Center are (i) Section 2-2-301, the "Best Available Control Technology" (BACT) requirement; (ii) Section 2-2-302, the "Offset" requirement; and (iii)

Section 2-2-304 the "Prevention of Significant Deterioration" (PSD) air quality impact analysis requirement.

1. Best Available Control Technology (BACT) Determinations

District Regulation 2-2-301 requires that any source that has the potential to emit 10 pounds or more per day of specified regulated air pollutants must employ the "Best Available Control Technology" (BACT) to control emissions of these pollutants. Pursuant to Regulation 2-2-206, BACT is defined as the more stringent of:

(a) "The most effective control device or technique which has been successfully utilized for the type of equipment comprising such a source; or

(b) The most stringent emission limitation achieved by an emission control device or technique for the type of equipment comprising such a source: or

(c) Any emission control device or technique determined to be technologically feasible and cost-effective by the APCO, or

(d) The most effective emission control limitation for the type of equipment comprising such a source which the Environmental Protection Agency (EPA) states, prior to or during the public comment period, is contained in an approved implementation plan of any state, unless the applicant demonstrates to the satisfaction of the APCO that such limitations are not achievable. Under no circumstances shall the emission control required be less stringent than the emission control required by any applicable provision of federal, state or District laws, rules or regulations."

The type of BACT described in subsections (a) and (b) must have been demonstrated in practice at an actual facility. This type of BACT is referred to as "BACT 2" or achieved-in-practice BACT. The BACT category described in subsection (c) is referred to as "technologically feasible/cost-effective" and it must be commercially available, demonstrated to be effective and reliable on a full-scale unit, and shown to be cost-effective on the basis of dollars per ton of pollutant abated. This is referred to as "BACT 1".

BACT guidelines (for both the achieved-in-practice and "technologically feasible/cost-effective" categories) for various source categories have been compiled in the BAAQMD BACT/Toxics Best Available Control Technology (TBACT) Workbook. The San Joaquin Valley Air Pollution Control District (SJVAPCD) and South Coast Air Quality Management District (SCAQMD) have also published BACT guidelines, and the ARB and EPA maintain BACT Clearinghouses that compile information on BACT determinations that have been made for past projects. Table 5 provides a comparison of the BACT emission limits for various pollutants in the guidelines published by the BAAQMD, SJVAPCD, and the SCAQMD.

Table 5: BACT Guidelines for Spark-Ignited Lean Burn Reciprocating Internal Combustion Engines

District	NO_x (ppmvd)	POC (ppmvd)	CO (ppmvd)	PM_{10} (g/bhp-hr)
BAAQMD Achieved-in-practice	12	32	74	n/a
BAAQMD Technologically Feasible	6	n/a	12	n/a
SJVAPCD Achieved-in-practice	9	25	56	0.02
SJVAPCD Technologically Feasible	5	n/a	n/a	n/a
SCAQMD Achieved-in-practice	9	25	33	n/a

Notes: 1. All ppmvd values corrected to 15% O_2.

2. SJVAPCD PM_{10} BACT Guideline based on GUIDANCE FOR THE PERMITTING OF ELECTRICAL GENERATION TECHNOLOGIES (November 2001). No source test data has been found to demonstrate that this value is actually achieved-in-practice.

It should be noted that information in Table 5 was published in the various BACT guidelines, but may not be updated to reflect the latest information.

In determining what level of emissions control to require as BACT for the proposed Eastshore Energy Center, the District consulted these BACT guidelines and also looked at similar facilities that have recently been built in Tehama County, San Joaquin Valley, Nevada, Kansas, Colorado, and Missouri.

a. BACT Determination for Natural Gas Fired Engine Generator Sets

The following discussion describes the District's BACT determinations by pollutant for the natural gas fired engine generator sets of the proposed Eastshore Energy Center. In summary, the District's BACT determinations are as follows:

- For NO_x (as NO_2), BACT is an emission limit of 5 ppmvd @ 15% O_2. This is a technologically feasible/cost effective BACT emission limit based on SCR control technology.
- For CO, BACT is an emission limit of 13 ppmvd @ 15% O_2. This is a technologically feasible/cost effective BACT emission limit based on control with an Oxidation Catalyst.
- For POC, BACT is an emission limit of 25 ppmvd @ 15% O_2 at engine load greater than 75%. This is an achieved-in-practice BACT emission limit based on control using an Oxidation Catalyst.

- For $PM_{10}/PM_{2.5}$ BACT is a daily facility-wide emissions limit of 461.65 lb/day, which is based on average emissions of 1.3 lb/hr per engine and one cold startup per day. For each individual engine, BACT is a 1.3 lb/hr limit where feasible, with a provision for any individual engine to emit up to 1.9 lb/hr as long as it meets the daily facility wide limit. This is considered an achieved-in-practice BACT emission limit based on the use of PUC quality natural gas and good combustion practices, and is also technologically feasible and cost-effective.

The detailed BACT analysis for each pollutant is provided below.

Nitrogen Oxides (NO_x as NO_2)

NO_x (as NO_2) emissions from natural gas fired engines may be controlled using combustion controls and post-combustion controls. Combustion controls reduce the formation of NO_x during the combustion process. Post-combustion controls remove the NO_x from the engine exhaust.

Wartsila 20V34SG engines incorporate several combustion controls. Lean Burn Combustion utilizes more air in the cylinder than is required for complete combustion. Lean combustion reduces the peak temperature and less thermal NO_x is produced. Pre-Chamber Combustion Ignition (also known as Clean Burn Combustion, or Prestratified Charge) ignites a portion of the lean air-fuel mixture in a small prechamber above each cylinder. The prechamber combustion provides a high energy ignition source for the main fuel charge in the cylinder. These engines also utilize a turbocharging system to increase the fuel/air density resulting in greater combustion efficiency.

The facility will also incorporate post-combustion control in the form of a Selective Catalytic Reduction (SCR) system, which controls NO_x emissions by reacting the NO_x with ammonia (NH_3) in the presence of a catalyst to form water and nitrogen. Estimated control efficiencies are greater than 90%. In order to provide effective NO_x control the ammonia injection rate is higher than the amount consumed in the NO_x removal reactions and a small amount is emitted at the stack. The amount of unreacted ammonia is known as the ammonia slip.

The BAAQMD BACT guidelines specify SCR for NO_x Control as the typical technology for BACT Level 1 (Technologically Feasible/Cost Effective) and for BACT Level 2 (Achieved-in-practice) for this source category. The BACT guidelines state that Level 2 BACT for NO_x emissions is 12 ppmvd @ 15 percent O_2. The BAAQMD BACT guidelines state that Level 1 BACT for NO_x emissions is 6 ppmvd @ 15 percent O_2. This level was based on a permit issued by the Tehama County Air Pollution Control District for a facility that operates natural gas fired engine generator sets located in Red Bluff, California. Subsequent operation of that facility demonstrated that it could not achieve a 6 ppmvd @ 15 percent O_2 limit, however, and so the NO_x emissions limit was revised to 9 ppmvd @ 15% O_2. The District's BACT Level 1 guideline will be revised based on the latest information available for this source category.

District staff surveyed other similar facilities to determine what levels of NO_x emissions have been achieved-in-practice. Both the Tehama County facility and the San Joaquin Valley facility

are meeting permit limits of 9 ppmvd @ 15% O_2. Level 2 achieved-in-practice BACT is therefore 9 ppmvd @ 15% O_2.

District staff then determined whether a more stringent NO_x limit would be technologically feasible and cost-effective. The proposed facility is expected to be able to reliably achieve a limit of 5 ppmvd @ 15% O_2, and the applicant has no objection as to the cost-effectiveness of this limit. Level 1 BACT is therefore 5 ppm @15% O_2 for this proposed facility. This would be the most stringent NO_x emissions limit achieved by any facility of this type. After the facility demonstrates actual compliance with this limit over 6 months, the limit may be a new achieved-in-practice BACT for this source category.

Based on the information discussed above, the proposed permit limit for NO_x of 5 ppmvd @ 15 percent O_2 meets the BACT requirement for NO_x. The corresponding proposed permit limit for ammonia slip is 10 ppmvd @ 15% O_2.

Carbon Monoxide (CO)

Similar to NO_x controls, the emissions of CO from an internal combustion engine may be controlled using combustion controls and post-combustion controls. Combustion controls reduce incomplete combustion and minimize CO formation. Post-combustion controls remove CO in the exhaust by oxidizing the CO to CO_2.

CO emissions and NO_x emissions are related, and improved CO combustion control will adversely affect the NO_x control (e.g. higher combustion temperature leads to increased thermal NO_x). Combustion controls are usually optimized for NO_x emission control and then evaluated for CO emissions. The tuning process will evaluate the optimal NO_x emissions and also look at conditions where the CO emissions increase dramatically.

The BAAQMD BACT guidelines specify the use of an Oxidation Catalyst as the typical technology for BACT Level 1 (Technologically Feasible/Cost Effective) and BACT Level 2 (Achieved-in-practice) for this source category. The guidelines specify a BACT Level 1 limit for CO of 12 ppmvd @ 15% O_2. As with the guidelines' limit for NO_x, however, this CO limit was based on the initial permit limit for the Tehama County facility, which has shown not to be actually achievable by the facility and which has subsequently been revised to 56 ppmvd @ 15% O_2. The District's BACT Level 1 guideline will be revised based on the latest information available for this source category.

To determine what level of CO emissions has actually been achieved-in-practice elsewhere, the District examined the current CO emission limits of the Tehama County and San Joaquin Valley facilities. The Tehama County facility is operating with a CO permit limit of 56 ppmvd @ 15% O_2, as noted above, and the San Joaquin Valley facility is operating with a CO permit limit of 20 ppmvd @ 15% O_2. Level 2 achieved-in-practice BACT is therefore no lower than 20 ppmvd @ 15% O_2.

The proposed facility is expected to be able to reliably achieve a limit of 13 ppmvd @15% O_2, and the applicant has no objection as to the cost-effectiveness of this limit. Level 2 BACT is

therefore 13 ppmvd @ 15% O_2 for this proposed facility. This would be the most stringent CO emissions limit achieved by any facility of this type.

Based on the information discussed above, the proposed permit limit for CO of 13 ppmvd @ 15% O_2 meets the BACT requirement for CO. The proposed facility will also satisfy the BACT requirements of utilizing natural gas as fuel, good combustion practices, and abating each engine with an Oxidation Catalyst.

Precursor Organic Compounds (POC)

Control techniques that minimize CO emissions also reduce the emission of POC from an internal combustion engine. Combustion controls ensure complete combustion and minimize POC formation. Post-combustion controls oxidize the POC in the exhaust to CO_2.

The BAAQMD BACT guidelines specify the use of an Oxidation Catalyst as the typical technology for BACT Level 1 and BACT Level 2 for this source category. The guidelines do not specify an emissions limit for BACT Level 1 for POC. They specify a BACT Level 2 limit for POC of 32 ppmvd @ 15 percent O_2, but again this level was based on the initial permit limits for the Tehama County facility, which have subsequently been revised. The District's BACT Level 1 guideline will be revised based on the latest information available for this source category.

To determine what level of POC emissions has actually been achieved-in-practice elsewhere, the District examined the current POC emission limits of the Tehama County and San Joaquin Valley facilities. The Tehama County facility is operating with a POC permit limit of 25 ppmvd @ 15% O_2, as noted above, and the San Joaquin Valley facility is operating with a POC permit limit of 30 ppmvd @ 15% O_2. Level 2 achieved-in-practice BACT is therefore no lower than 25 ppmvd @15% O_2.

The proposed facility is not expected to be able to reliably achieve a limit below 25 ppmvd @ 15% O_2 based on data supplied by the engine manufacturer. There is therefore no basis for establishing a Level 1 BACT level lower than 25 ppmvd @ 15% O_2 for this proposed facility. The facility is expected to be able to reliably achieve 25 ppmvd @ 15% O_2, however, which satisfies Level 2 BACT.

This 25 ppmvd @ 15% O_2 emissions performance is based on operating at 75% load or greater, which is reflected in the proposed permit condition. If these engine generator sets operate at lower load, the concentration of emissions (expressed as ppmvd) will be higher, up to 33 ppmvd @ 15% O_2. But even though the *concentration* of POC in the exhaust stream will be higher in this scenario, the *total mass* of POC that is emitted will be less, because there is less exhaust emitted during low-load operations. Note that the annual POC emissions used in this document were estimated assuming operation at 100% load at all times. This is a conservative approach because 100% load is the worst-case scenario for POC emissions.

Based on the information discussed above, the natural gas fired lean burn engine generator sets will meet the BACT requirements for POC. The use of an Oxidation Catalyst to control POC

emissions is also considered to be TBACT for this source category. The CO CEM will be a good indicator of good combustion practice and Oxidation Catalyst condition at each engine generator set and is monitored on a continuous basis. Low CO emissions from the engine generator sets generally correspond to low POC emissions.

Particulate Matter ($PM_{10}/PM_{2.5}$)

$PM_{10}/PM_{2.5}$ will be controlled by using clean-burning natural gas and good combustion practices. There are no practical post-combustion controls for $PM_{10}/PM_{2.5}$ emissions from this source category.

The BAAQMD BACT guidelines do not specify a typical technology or emission limits for this source category for $PM_{10}/PM_{2.5}$. The District therefore looked to emissions information from similar engines at other facilities to make the BACT determination.

The first step in the BACT analysis is to review established permit limits to determine an achieved-in-practice BACT level for a specific pollutant from a given source category. For the other pollutants emitted by this source category that are subject to BACT, the permit limits corresponded to the actual emissions data obtained by the District plus an additional compliance margin. The $PM_{10}/PM_{2.5}$ emissions data obtained by the District for this source category was often significantly lower than the permit limits for a given facility. $PM_{10}/PM_{2.5}$ emissions from the Eastshore Energy Center are subject to BACT requirements, and the District reviewed available emissions data to set a permit limit with a resonable compliance margin. The District $PM_{10}/PM_{2.5}$ limit agrees with the actual emissions data available for the source category.

The District has determined that with clean-burning natural gas and good combustion practices, the engine generator sets will, on average, be able to maintain $PM_{10}/PM_{2.5}$ emissions below 1.3 lb/hr. This determination is based on emissions data from other facilities equipped with similar lean burn natural gas fired internal combustion engines. The District evaluated the results of 22 source tests from facilities in San Joaquin Valley, Missouri, Kansas, Colorado and Nevada. The average $PM_{10}/PM_{2.5}$ emission rate was 0.4 lb/hr. The maximum $PM_{10}/PM_{2.5}$ emission rate was 1.0 lb/hr. The San Joaquin Valley facility has a permit limit of 0.029 g/bhp-hr that corresponds to 0.27 lb/hr and two engines were tested when the facility started up in 2001. The results of the San Joaquin test demonstrated that those engines could meet that permit limit. The District considered this permit limit for the Eastshore Energy Center, but the San Joaquin permit limit has limited test data and has no compliance margin. Based on review of the available emissions information, the District has determined these lean burn natural gas fired engines proposed for the Eastshore Energy Center, on average, will have $PM_{10}/PM_{2.5}$ emission rates below 1.0 lb/hr. The District recognizes that most of the data reviewed was from new engines with new catalyst beds and that emissions performance can decline as engines and catalysts age. The District has added a 30% compliance margin to the permit limit allowing emissions of 1.3 lb/hr, on average, before the facility is considered in violation of the BACT requirement. The District also recognizes that emissions performance may vary among individual engines, and may vary due to changes in engine operating conditions. Emissions variability may also be due to the source test methods. As a result of all of these factors a specific engine may have a high test result. The high test result may represent emissions over a short period of time, that are not representative of

emission rates over a longer period of time. The District has determined that individual engines should be allowed to operate with emission rates of up to 1.9 lb/hr where it is not feasible to meet the 1.3 lb/hr limit as long as facility-wide emissions do not exceed the daily limit for $PM_{10}/PM_{2.5}$. The manufacturer has guaranteed that the engines can meet a 1.9 lb/hr limit during normal operation not including startup/shutdown.

The $PM_{10}/PM_{2.5}$ emissions data for lean burn natural gas fired engine generator set is shown in Table 6.

Table 6: $PM_{10}/PM_{2.5}$ Emissions Data for Lean Burn Natural Gas Fired Engine Generator Sets

Location, Model	Type of Test	Date	Method	Run 1 (lb/hr)	Run 2 (lb/hr)	Run 3 (lb/hr)	Average (lb/hr)
San Joaquin Valley, Duetz, Unit 3, 4157 HP	Compliance	Oct-01	EPA 5/202	0.11	0.08	0.10	0.10
San Joaquin Valley, Duetz, Unit 4, 4157 HP	Compliance	Oct-01	EPA 5/202	0.08	0.07	0.08	0.08
Missouri, Wartsila, 18V34SG, Test 1, Unit 12	Engineering	Jan-02	EPA 5/202	1.316	0.543	0.869	0.909
Missouri, Wartsila, 18V34SG, Test 2, Unit 12	Engineering	Jan-02	EPA 201A/202	0.389	0.309	0.213	0.304
Kansas, Wartsila, 18V34SG, Test 3	Engineering	May-99	EPA 5/202	0.91	0.69	0.63	0.74
Colorado, Wartsila, 18V34SG, Test 4, Engine 15	Engineering	Aug-05	EPA 5/202	0.709	0.527	0.442	0.559
Nevada, Wartsila, 20V34SG, Test 5, Engine 12	Engineering	Sep-05	EPA 5/202	0.496	0.54	0.432	0.49
Nevada, Wartsila, 20V34SG, Test 5, Engine 13	Engineering	Sep-05	EPA 5/202	0.477	0.449	2.137	1.021
Nevada, Wartsila, 20V34SG, Test 6, Engine 1	Compliance	Nov-05	EPA 5/202	0.24	0.29	0.32	0.28
Nevada, Wartsila, 20V34SG, Test 6, Engine 2	Compliance	Nov-05	EPA 5/202	0.24	0.17	0.28	0.23
Nevada, Wartsila, 20V34SG, Test 6, Engine 3	Compliance	Nov-05	EPA 5/202	0.2	0.15	0.21	0.19
Nevada, Wartsila, 20V34SG, Test 6, Engine 4	Compliance	Nov-05	EPA 5/202	0.2	0.11	0.28	0.2
Nevada, Wartsila, 20V34SG, Test 6, Engine 5	Compliance	Nov-05	EPA 5/202	0.17	0.22	0.39	0.26
Nevada, Wartsila, 20V34SG, Test 6, Engine 6	Compliance	Nov-05	EPA 5/202	0.36	0.53	0.26	0.38
Nevada, Wartsila, 20V34SG, Test 6, Engine 7	Compliance	Nov-05	EPA 5/202	0.26	0.36	0.78	0.46
Nevada, Wartsila, 20V34SG, Test 6, Engine 8	Compliance	Nov-05	EPA 5/202	0.29	0.27	0.31	0.29
Nevada, Wartsila, 20V34SG, Test 6, Engine 9	Compliance	Nov-05	EPA 5/202	0.51	0.66	0.16	0.44
Nevada, Wartsila, 20V34SG, Test 6, Engine 10	Compliance	Nov-05	EPA 5/202	0.59	0.72	0.44	0.59
Nevada, Wartsila, 20V34SG, Test 6, Engine 11	Compliance	Nov-05	EPA 5/202	0.81	0.46	0.52	0.6
Nevada, Wartsila, 20V34SG, Test 6, Engine 12	Compliance	Nov-05	EPA 5/202	0.28	0.29	0.18	0.25
Nevada, Wartsila, 20V34SG, Test 6, Engine 13	Compliance	Nov-05	EPA 5/202	0.26	0.17	0.24	0.23
Nevada, Wartsila, 20V34SG, Test 6, Engine 14	Compliance	Nov-05	EPA 5/202	0.19	0.26	0.28	0.24
Average							0.402
Maximum of Averages							1.021
Minimum of Averages							0.080
Standard Deviation of Averages							0.250
Maximum Single Run							2.137
Minimum Single Run							0.070
Standard Deviation of All Test Runs							0.322

The source test data from other similar facilities that the District reviewed, in conjunction with the manufacturer's guaranteed performance level, show that Wartsila natural gas fired internal combustion engines have achieved emissions below 1.3 lb/hr on average, and below 1.9 lb/hr for individual engines. The District is therefore including these emission rates as BACT Level 2 permit limits.

Furthermore, these limits are technologically feasible and cost-effective. The emissions data from similar facilities shows that these permit limits are technologically feasible. The cost of achieving them is zero, as there is no add-on control equipment required or other costs the owner/operator would have to incur to meet these limits over and above the costs of normal operation. These permit limits meet the requirements of BACT 1 as well as the requirements of achieved-in-practice BACT Level 2.

It should be noted that this BACT determination represents an evolution of the District's analysis from what was set forth in the PDOC in April of 2007. The PDOC stated that there was only limited test data available form similar engines, and that "the District has determined that it cannot establish a level of PM_{10} emissions that has been reliably achieved-in-practice from any of the facilities." (PDOC, pg. 15) The District's position on this issue has evolved based on additional information it has received after issuance of the PDOC. This information showed that in fact, emission rates of 1.3 lb/hr on average and up to 1.9 lb/hr maximum have been achieved-in-practice at other facilities.

In addition, establishing a numerical BACT emissions limit for $PM_{10}/PM_{2.5}$ emissions is somewhat of a departure from the District's past practice with respect to natural gas combustion sources. Historically, the District has expressed BACT for such sources as the use of clean burning natural gas and the use of good combustion practices, not as a numerical emissions limit (although the District did impose numerical limits in accordance with "cumulative increase" requirements). The engine generator sets are different from other natural gas fired combustion sources utilized at peaking facilities such as simple cycle gas turbines. These engine generator sets have the potential to emit significant quantities of $PM_{10}/PM_{2.5}$ emissions, and may emit more $PM_{10}/PM_{2.5}$ emissions per unit of electricity produced than other electrical generation technologies. Based on this information, and after considering comments from the California Air Resources Board and the California Energy Commission, the District is imposing numerical BACT limits for the natural gas fired engine generator sets at the proposed facility. This approach is not necessarily appropriate for other types of natural gas combustion sources.

The District is therefore establishing BACT permit conditions that would limit $PM_{10}/PM_{2.5}$ emissions to 1.3 lb/hr. If an engine is tested and found to have emissions above 1.3 lb/hr, the owner/operator will have to demonstrate that the engine has been properly installed, operated, and maintained to minimize emissions. The owner/operator will also be required to conduct a retest of the high emitting engine. If the results of the retest remain above 1.3 lb/hr, then the owner/operator may continue to operate the engine as long as emissions from that engine do not exceed 1.9 lb/hr, the facility-wide daily emissions limit that is based on 1 cold start and 23.5 hours at 1.3 lb/hr for each engine is not exceeded and the owner/operator has demonstrated to the District's satisfaction that the engine has been installed, operated, and maintained properly. The

facility-wide $PM_{10}/PM_{2.5}$ emissions limit is 461.65 lb/day, which corresponds to one cold startup and 23.5 hours of normal operation at 1.3 lb/hr for all fourteen engines. The annual permit limit corresponds to 300 cold startup per engine and 3807.5 hours of normal operation at 1.3 lb/hr for each engine. The engines are only allowed to burn PUC quality natural gas as a BACT condition.

Based on the information discussed above, the natural gas fired engine generator sets will meet BACT for $PM_{10}/PM_{2.5}$ utilizing PUC quality natural gas and good combustion practices and by meeting hourly, daily, and annual emission caps. In addition, the CO CEM will be a good indicator of good combustion practice at each engine generator set and is monitored on a continuous basis. Low CO emissions from the engine generator sets generally correspond to low particulate emissions since each are products of incomplete combustion.

b. BACT Determination For Emergency Standby Generator Set; Diesel Engine

Based upon 24 hour per day operation under emergency conditions, the proposed emergency standby generator set diesel engine triggers BACT for NO_x and CO, since its potential to emit for each of those pollutants exceeds 10 pounds per day. (Operation for a full day under emergency conditions is highly unlikely, but for purposes of the BACT analysis, the District utilizes a worst-case operating scenario.) The emergency standby generator will only be used when the proposed power plant has no natural gas fired engine generator sets operating and there is a power outage and no electricity is available to the facility. The emergency standby generator supplies the necessary power to start one of the natural gas fired engine generator sets and then is no longer necessary. It is not anticipated that the emergency standby generator would ever need to be operated for longer than one hour during an emergency.

The District has adopted BACT guidelines for internal combustion engines, which involve a two-step analysis. The first step determines what type of engine can be used. For most applications, the District requires internal combustion engines to be low emitting, spark-ignited, gas-fueled engines with lean burn combustion, or with rich-burn combustion with non-selective catalytic reduction, or to be substituted with an electric motor. In certain limited instances where those other alternatives are not practicable, such as with engines used exclusively for emergency use during involuntary loss of power, the District allows the use of diesel engines. (*See* District BACT Workbook Document 96.1.2., reference note b.) The use of a diesel engine at the proposed Eastshore facility complies with this BACT requirement because it is for backup emergency use and will not be used for routine generating purposes.

The second step of the BACT analysis determines the amount of emissions that are allowed from the engine. In applications where diesel engines may be used, Level 2 achieved-in-practice BACT is based on the best performance of commercially available diesel engines in similar applications, as certified by the California Air Resources Board (CARB). These Level 2 BACT emission limits are set forth in Table 7. It is technically feasible to achieve lower emissions by installing add-on control devices such as catalytic oxidation or selective catalytic reduction systems, which are identified in the District's guidelines as Level 1 BACT. But such add-on control devices are not cost-effective for emergency standby engines due to the limited hours of

operation for these engines. District regulations therefore do not require Level 1 BACT for the proposed emergency standby generator at the Eastshore facility, as long as Level 2 BACT is met.

The proposed Eastshore emergency standby diesel engine will meet or exceed the District's BACT Level 2 requirements. S-15 has an emission rate of diesel particulate matter that also complies with the District's TBACT guidelines. The current District BACT Level 2 limits and the specifications for the proposed engine are summarized in Table 7.

Table 7: District BACT Limits for Proposed Emergency Standby Generator Set, Diesel Engine

Pollutant	District BACT Guideline (g/bhp-hr)[a]	Engine[b] Specifications (g/bhp-hr)
NO_x (as NO_2)	6.9	2.62
CO	2.75	2.31
POC	1.5	0.14
PM_{10}	0.15	0.11

[a]BACT 2 (achieved-in-practice) per District BACT Guideline 96.1.2, "IC Engine –Compression Ignition $\geq$ 275 hp output rating".

[b]California Air Resources Board Executive Order U-R-001-0287.

2. Emission Offsets

District regulations require that new facilities must provide Emission Reduction Credits (ERCs) to offset the increases in air emissions that they will cause. ERCs are generated when old facilities are shut down, or when sources are controlled below regulatory limits. The emissions reductions granted by the District are used to offset the increases from new facilities, so that there will be no overall increase in emissions from facilities subject to this offset program.

a. Offset Requirements For The Proposed Eastshore Energy Center

<u>POC and NO_x</u>

District Regulation 2-2-302 requires that federally enforceable emission offsets must be provided for POC and NO_x (as NO_2) emission increases from permitted sources at facilities that will emit 10 tons per year or more on a pollutant-specific basis. For facilities that will emit more than 35 tons per year of NO_x (as NO_2), offsets must be provided by the applicant at a ratio of 1.15 to 1.0. The proposed Eastshore facility will emit more than 35 tons per year of both of those pollutants, and so it is required to offset all POC and NO_x emissions at a ratio of 1.15 to 1.0. For NO_x, the proposed facility will be permitted to emit 54.353 tons per year, which will require offsets of 62.506 tons per year. For POC, the proposed facility will be permitted to emit 76.110 tons per year, which will require offsets of 87.527 tons per year. The applicant has elected to provide POC emission reduction credits for all of the required offsets for POC and NO_x, as provided for in District Regulation 2-2-302.2. In total, 150.033 tons per year of offsets will be required.

PM_{10} and SO_2

District Regulation 2-2-303 requires that emission offsets must be provided for PM_{10} and SO_2 emission increases at new facilities that will be permitted to emit more than 100 tons per year of PM_{10} or SO_2 on a pollutant-specific basis. The proposed Eastshore Energy Center will not emit more than 100 tons of either of these pollutants, and so it is not subject to this requirement. Regulation 2-2-303 does allow for the voluntary offsetting of SO_2 emission increases of less than 100 tons per year, but the applicant has not opted to provide such voluntary emission offsets.

b. Timing for Provision of Offsets

Pursuant to District Regulation 2-2-311, the applicant must provide the required valid emission reduction credits to mitigate the emission increases for the facility prior to the issuance of the Authority to Construct. Pursuant to District Regulation 2, Rule 3, "Power Plants," the Authority to Construct will be issued if the California Energy Commission (CEC) certifies the proposed power plant.

c. Offset Package

Eastshore Energy, LLC currently is negotiating for sufficient valid emission reduction credits to offset the emission increases from the permitted sources proposed for the Eastshore Energy Center. Table 8 below summarizes the current offset obligation of the Eastshore Energy Center and the quantity of valid emission reduction credits (ERCs) under negotiation by Eastshore Energy, LLC. The emission reduction credits presented in Table 8 exist as federally enforceable, banked emission reduction credits that have been reviewed for compliance with District Regulation 2, Rule 4, "Emissions Banking", and were subsequently issued as banking certificates by the BAAQMD. If the quantity of offsets issued under any certificate exceeded 35 tons per year for any pollutant, the application is required to fulfill the public notice and public comment requirements of District Regulation 2-4-405. Accordingly, such applications were reviewed by the California Air Resources Board, U.S. EPA, and adjacent air pollution control districts to insure that all applicable federal, state, and local regulations were satisfied. Note that the specific offset package is still under negotiation and is subject to change, as the offset credits do not actually have to be provided until such time as the Authority to Construct is issued. The amount of credits that must be submitted will not change, however.

Table 8: Emission Reduction Credits Identified by Eastshore Energy, LLC as of July 2007 (tons of POC/yr)

Emission Reduction Credit Banking Certificate #	Tons of POC per year
823, Crown Cork & Seal Company[a], Union City	71.000
1015, Koch Supply and Trading LP[b], Fremont	22.778
1016, Koch Supply and Trading LP[c], San Leandro	15.518
1017, Koch Supply and Trading LP[d], San Leandro	4.4
1022, Koch Supply and Trading LP[e], Cupertino	19.718
1019, Koch Supply & Trading LP[f], Milipitas	15.856
1006, Koch Supply and Trading LP[g], Union City	23.4
Total ERCs Identified	172.67
Total Offsets Required	150.033
Surplus Offset Balance	**+22.637**

[a]original certificate #51, Application No. 30496, Continental Can Company, issued 10/21/86
[b]original certificate #234, Application No.9507 , Tri Valley Growers Container Division, Inc., issued 12/1/93.
[c]original certificate #234, Application No.9507 , Tri Valley Growers Container Division, Inc., issued 12/1/93.
[d]original certificate #56, Application No. 30949, International Paper Company, issued 10/7/85
[e]original certificate #136, Application No. 6202, Kaiser Aluminum & Chemical Company, issued 3/26/92
[f]original certificate #573, Application No. 18297, LSI Logic Corporation, issued 9/22/98
[g]original certificate #889, Application No. 6821, United States Pipe & Foundry Company, LLC, issued 6/6/03

The original certificate is the company and the location of the emission reduction that resulted from closing down a source or controlling a source beyond what current regulations required at the time. The certificate numbers are changed when a new owner obtains an Emission Reduction Credit located in the District Bank. The certificate numbers in Table 8 are the current valid numbers with the current owner.

Original Certificate #51 was issued in 1986 after the Continental Can Company in Union City shutdown. Twenty sources were shutdown to generate the Precursor Organic Compound (POC) Emission Reduction Credits. The sources were Can Coating and Printing operations and associated drying ovens.

Original Certificate #234 was issued in 1993 after Tri Valley Growers Container Division in Fremont modified three Die Presses. The facility produced metal cans. The modification was changing some of the materials in the process to materials with lower POC content, and this modification resulted in lower emissions. The emission reductions at this facility were used to generate POC Emission Reduction Credits.

Original Certificate #56 was issued in 1985 after International Paper in San Leandro closed a Printing facility. The sources of POC emissions were the ink, varnish, and cleanup solvents associated with printing presses.

Original Certificate #136 was issued in 1992. The Kaiser Aluminum & Chemical Corporation in Cupertino closed their Foil Production Plant in 1990. The emission reductions from the closure of eleven sources were used to generate these Precursor Organic Compound Emission Reduction Credits.

Original Certificate #573 was issued in 1998. LSI Logic Corporation in Milpitas closed two sources down in 1997. One source was a back end fabrication area and the other was solvent cleaning stations.

Original Certificate #889 was issued in 2003 after U.S. Pipe & Foundry Company in Union City switched from a solvent based coating to a water based coating. The coatings were used to paint pipes at the facility. The emission reductions from the material change were used to generate POC Emission Reduction Credits.

It should be noted that in the case of POC and NO_x offsets, District regulations do not require consideration of the location of the source of the emission reduction credits relative to the location of the proposed emission increases that will be offset. This is because POC and NO_x are ozone precursors, which are regulated as part of the District's efforts to control regional smog. Because ozone creation is a regional phenomenon, emissions decreases in one area of the region will be effective in offsetting emissions increases in other areas of the region. The location of the Emission Reduction Credits is provided for informational purposes.

3. PSD Air Quality Impact Analysis

BAAQMD Regulation 2-2-414.1 requires proposed permits for certain large facilities to undergo an emissions modeling analysis for purposes of the District's "Prevention of Significant Deterioration" (PSD) program. The categories of projects subject to this requirement are outlined in District regulations 2-2-304, 305, 306, and 308. The proposed Eastshore facility does not fall into any of these categories, and therefore does not require a PSD modeling analysis.

B. Health Risk Assessment

Pursuant to the BAAQMD Regulation 2, Rule 5, a health risk screening must be conducted to determine the potential impact on public health resulting from the worst-case emissions of toxic air contaminants (TACs) from the Eastshore Energy Center. The potential TAC emissions (both carcinogenic and non-carcinogenic) from the Eastshore Energy Center are summarized in Table 4. The health risk screening analysis performed by the District Toxics Evaluation Section was prepared in accordance with guidelines adopted by Cal/EPA's Office of Environmental Health Hazard Assessment (OEHHA). In accordance with the requirements of the BAAQMD Regulation 2, Rule 5, the impact on public health due to the emission of these compounds was assessed utilizing approved air pollutant dispersion models. The health risk screening analyis results are shown in Table 9.

Table 9: Health Risk Screening Analysis Results

Sources	Multi-pathway Carcinogenic Risk (risk in one million)	Chronic Hazard Index[a]	Acute Hazard Index[a]
Residential Receptor			
14 Natural Gas Engine Generator Sets	0.32	0.005	0.028
Emergency Standby Generator Set[b]	0.0113	0.0000068	ND
Worker Receptor			
14 Natural Gas Engine Generator Sets	3.54	0.065	0.066
Emergency Standby Generator Set[b]	0.63	0.00045	ND
Maximum Facility Risk:	3.856[b]	0.065	0.066

[a]Per BAAQMD Health Risk Screening Analysis Guidelines, acrolein is not included in these Health Risk Assessment Results. Currently, CARB does not have certified emission factors or an analytical test method for acrolein. Therefore, since the appropriate tools needed to implement and enforce acrolein emission limits are not available, the District does not conduct a HRSA for emissions of acrolein. In addition, due to the significant uncertainty in the derivation, OEHHA is currently re-evaluating the acute REL for acrolein. When the necessary tools are developed, the District will re-evaluate this specific evaluation procedure and the HRSA guidelines will be revised. For this project, however, the District did perform an analysis of acrolein impacts from the natural gas engine generator sets, and the results were in compliance with Regulation 2, Rule 5 requirements.

[b]Because the location of maximum impact for the diesel engine does not coincide with the locations of maximum impact for the other sources, the carcinogenic risk numbers do not add directly to determine the maximum facility cancer risk shown

Pursuant to the BAAQMD Regulation 2, Rule 5, the estimated potential increased carcinogenic risk attributed to this project is considered acceptable since it is less than 10 in one million and the Sources are in compliance with the current Toxics Best Available Control Technology (TBACT) requirements, as explained above. The chronic hazard index attributed to the emission of non-carcinogenic air contaminants is considered acceptable since it is less than 1.0. Therefore, the proposed Eastshore Energy Center is deemed to be in compliance with the BAAQMD Regulation 2, Rule 5. Please see the Appendices for further discussion.

C. Other Applicable District Rules and Regulations

Regulation 1, Section 301: Public Nuisance

None of the project's proposed sources of air contaminants are expected to cause a public nuisance as defined in District Regulation 1, Section 301 with respect to any impacts resulting from the emission of air contaminants regulated by the District.

Regulation 2, Rule 1, Sections 301 and 302: Authority to Construct and Permit to Operate

Pursuant to Regulation 2-1-301 and 2-1-302, the Eastshore Energy, LLC has submitted an application to the District to obtain an Authority to Construct and Permit to Operate for the proposed S-1 through S-14 Natural Gas Fired Engine Generator Sets, and S-15 Emergency Standby Generator Set; Diesel Engine.

Regulation 2, Rule 1, Sections 426: CEQA-Related Information Requirements

As the lead agency under CEQA for the proposed Eastshore Energy Center, the California Energy Commission (CEC) will satisfy the CEQA requirements of Regulation 2-1-426.2.1 by producing their Final Certification, which serves as an EIR-equivalent pursuant to the CEC's CEQA-certified regulatory program in accordance with CEQA Guidelines Section 15253(b) and Public Resource Code Sections 21080.5 and 25523. The District supports the CEC's certification process and is participating in it with respect to air quality issues.

Regulation 2, Rule 2: New Source Review

The Eastshore Energy Center Authority to Construct Permit Application/Determination of Compliance will comply with the requirements of Regulation 2, Rule 2. The applicable requirements of Regulation 2, Rule 2, are addressed in detail in Section A above.

Regulation 2, Rule 3: Power Plants

Pursuant to Regulation 2-3-405, this Final Determination of Compliance (FDOC) serves as the APCO's final determination that the proposed power plant will meet the requirements of all applicable BAAQMD, state, and federal regulations. The FDOC contains proposed permit conditions to ensure compliance with those regulations. Pursuant to Regulation 2-3-404, the Preliminary Determination of Compliance (PDOC) was subject to the public notice, public comment, and public inspection requirements contained in Regulations 2-3-404, 2-2-406 and 2-2-407.

Regulation 2, Rule 5: New Source Review of Toxic Air Contaminants

The Eastshore Energy Center Authority to Construct Permit Application/Determination of Compliance will comply with the requirements of Regulation 2, Rule 5. The natural gas fired engine generator sets S-1 through S-14 and the Emergency Standby Generator S-15 are considered to meet Toxics Best Available Control Technology (TBACT) requirements. S-1 through S-14 are abated by an Oxidation Catalyst that will reduce organic compound emissions. S-15 has an emission rate of diesel particulate matter that complies with the District's TBACT guidelines. The applicable requirements of Regulation 2, Rule 5, are addressed in more detail in Section B above.

Regulation 2, Rule 6: Major Facility Review

The owner/operator of the Eastshore Energy Center is not required to submit an application to the BAAQMD for a major facility review permit since the facility is not subject to Regulation 2, Rule 6 requirements.

Regulation 2, Rule 7: Acid Rain

The Eastshore Energy Center Engine Generator Sets are not subject to the permit program requirements of Title IV of the federal Clean Air Act. The requirements of the Acid Rain Program are outlined in 40 CFR Part 72. The Acid Rain program applies to sources with electrical generating units greater than 25 MW. Each engine generator set has a electrical generation capacity of 8.4 MW and therefore the units are not subject to the permit program portions of 40 CFR Part 72. The facility may be subject to portions of 40 CFR Part 72 (Provisions of §§72.2 through 72.6, and §§72.10 through 72.13 may apply to this facility). The facility is expected to comply with the applicable sections of 40 CFR Part 72.

Regulation 6: Particulate Matter and Visible Emissions

Through the use of proper combustion practices, the combustion of natural gas at the proposed natural gas fired engine generator sets and the diesel fired emergency standby generator set are not expected to result in visible emissions. Specifically, the facility's combustion sources are expected to comply with Regulation 6, including sections 301 (Ringelmann No. 1 Limitation), 302 (Opacity Limitation) with visible emissions not to exceed 20% opacity, and 310 (Particulate Weight Limitation) with particulate matter emissions of less than 0.15 grains per dry standard cubic foot of exhaust gas volume. As calculated in accordance with Regulation 6-310.3, the grain loading resulting from the simultaneous operation of each engine generator set is 0.015 gr/dscf @ 6% O_2. See Appendices for grain loading calculations.

Particulate matter emissions associated with the construction of the facility are exempt from District permit requirements but are subject to Regulation 6. It is expected that the conditions of certification imposed by the CEC will include requirements for construction activities that will require the use of water and/or chemical dust suppressants to minimize PM_{10} emissions and prevent visible particulate emissions.

Regulation 7: Odorous Substances

Regulation 7-302 prohibits the discharge of odorous substances, which remain odorous beyond the facility property line after dilution with four parts odor-free air. Regulation 7-302 limits ammonia emissions to 5000 ppmvd. Because the ammonia slip emissions from the proposed natural gas fired engine generator sets will each be limited by permit condition to 10 ppmvd @ 15% O_2, the facility is expected to comply with the requirements of Regulation 7.

Regulation 8: Organic Compounds

The natural gas fired engine generator sets are exempt from Regulation 8, Rule 2, "Miscellaneous Operations" per 8-2-110 since natural gas will be fired exclusively at those

sources. The emergency standby generator set diesel engine will comply with Regulation 8-2-301 since its emissions will contain a total carbon concentration of less than 300 ppmvd.

The use of solvents for cleaning and maintenance at the Eastshore Energy Center is expected to comply with Regulation 8, Rule 4, "General Solvent and Surface Coating Operations" section 302.1 by emitting less than 5 tons per year of volatile organic compounds.

Regulation 9: Inorganic Gaseous Pollutants

Regulation 9, Rule 1, Sulfur Dioxide

This regulation establishes emission limits for sulfur dioxide from all sources and applies to the combustion sources at this facility. Section 301 (Limitations on Ground Level Concentrations) prohibits emissions which would result in ground level SO_2 concentrations in excess of 0.5 ppmvd continuously for 3 consecutive minutes, 0.25 ppmvd averaged over 60 consecutive minutes, or 0.05 ppmvd averaged over 24 hours. Section 302 (General Emission Limitation) prohibits SO_2 emissions in excess of 300 ppmvd. The natural gas fired engine generator sets and the emergency standby generator diesel engine are not expected to cause ground level SO_2 concentrations in excess of the limits specified in Regulation 9-1-301 and will comply with section 302. California law mandates the use of ultra-low sulfur diesel fuel having a sulfur content of 0.0015% by weight.

Regulation 9, Rule 8, Nitrogen Oxides and Carbon Monoxide from Stationary Internal Combustion Engines

The proposed natural gas fired engine generator sets will comply with the emission limits contained in Regulation 9-8-301, and all other requirements of Regulation 9, Rule 8.

The proposed 369 hp emergency standby generator set diesel engine will comply with the emission limits contained in Regulation 9-8-304 (Effective 2012), and all other requirements of Regulation 9, Rule 8.

Regulation 10: Standards of Performance for New Stationary Sources

Regulation 10 incorporates by reference the provisions of Title 40 CFR Part 60. The applicable subparts of 40 CFR Part 60 include Subpart A, "General Provisions", and Subpart IIII "Standards of Performance for Stationary Compression Ignition Internal Combustion Engines". Subpart IIII has not been incorporated into Regulation 10 at this time. The emergency standby generator set diesel engine complies with all applicable standards and limits defined in these regulations. The applicable emission limitations are shown in Table 10.

Table 10: Applicable New Source Performance Standards

Source	Requirement	Emission Limitation	Compliance Verification
Emergency Standby Generator Set Diesel Engine	40 CFR 60, Subpart IIII	Requires diesel engines subject to this subpart to meet EPA Tier Emission Levels	Proposed Diesel Engine meets Tier 3 Requirements

The facility is expected to comply with the requirements in 40 CFR Part 60 Subpart IIII.

D. State Requirements

The facility is subject to the Air Toxic "Hot Spots" Program requirements contained in the California Health & Safety Code Section 44300 et seq. The facility will submit inventory updates as required.

The facility is subject to the Public Nuisance Provisions contained in the California Health & Safety Code Section 41700. The facility is expected to comply with these provisions.

The emergency standby generator set diesel engine is subject to the Airborne Toxic Control Measure (ATCM) for Stationary Compression Ignition Engine contained in Title 17 of the California Code of Regulations Section 93115. S-15 will comply with the Airborne Toxics Control Measure for Stationary Compression Ignition Engines (ATCM). The allowable operating hours and recordkeeping requirements contained in the ATCM will be included in the Permit Conditions below.

E. Federal Requirements

The facility is not subject to the current version (March, 2007) of the National Emission Standards for HAPs for Stationary Reciprocating Internal Combustion Engines (RICE) contained in 40 CFR Part 63 Subpart ZZZZ. The facility is not a major source of HAPs.

V Permit Conditions

The following permit conditions are proposed to ensure that the proposed project complies with all applicable District, State, and Federal Regulations. The conditions limit operational parameters such as fuel use, stack gas emission concentrations, mass emission rates and concentrations. The proposed permit conditions also specify abatement device operation and performance levels. To aid enforcement efforts, conditions specifying emission monitoring, source testing, and record keeping requirements are included. Furthermore, pollutant mass emission limits (in units of ton/yr) are proposed to insure that annual emission rate limitations are not exceeded.

To provide maximum operational flexibility, no limitations are proposed for the type, or quantity of engine generator set start-ups or shutdowns. Instead, the facility must comply with short term emission limits and annual (consecutive twelve-month) mass emission limits at all times. Compliance with CO and NO_x limitations will be verified by continuous emission monitors (CEMs) that will be in operation during all engine generator set operating modes, including start-up and shutdown. If the CO and NO_x CEMs are not capable of accurately assessing engine start-up and shutdown mass emission rates due to variable O_2 content and the differing response times of the O_2 and NO_x monitors, then start-up and shutdown mass emission rates will be based upon annual source test results. Compliance with POC, SO_2, and PM_{10} mass emission limits will be verified by using District approved emission factors developed or validated by site-specific source testing.

In addition to permit conditions that apply to steady-state operation of each natural gas fired engine generator set, conditions are being established that govern equipment operation during the initial commissioning period when the natural gas engine generator sets will operate without their SCR systems and/or oxidation catalysts in place. Commissioning activities include, but are not limited to the testing of the natural gas fired engines and adjustment of control systems. Proposed permit conditions 1 through 6 apply to this commissioning period and are intended to minimize emissions during the commissioning period.

Eastshore Energy Center Permit Conditions

(A) Definitions:

Calendar Day:	Any continuous 24-hour period beginning at 12:00 AM or 0000 hours
Year:	Any consecutive twelve-month period of time
Heat Input:	All heat inputs refer to the heat input at the higher heating value (HHV) of the fuel, in BTU/scf
Operating Hours:	Period of time during which fuel is flowing to a unit, measured in hours and minutes.
MM BTU:	Million British Thermal Units
Engine BHP during operation	(Electrical generator MW) x (1341 bhp/MW) x (1.0319 loss factor)
Engine Start-up:	An engine start-up that occurs when the SCR catalyst bed is below minimum operating temperature as specified by the abatement device manufacturer. The maximum time for startup shall be 30 minutes.
Corrected Concentration:	The concentration of pollutants shall be corrected to a standard value of 15% O_2 by volume on a dry basis. The following equation shall be used to calculate the corrected concentration. $X@15\%O_2 = (20.95 - 15)/(20.95 - \text{Stack } O_2\%) \times X@\text{Stack } O_2\%$
Commissioning Activities:	All testing, adjustment, tuning, and calibration activities during the commissioning period recommended by the equipment manufacturers and the Eastshore Energy Center construction contractor to insure safe and reliable steady state operation of the engines, abatement equipment, and associated electrical delivery systems
Commissioning Period:	The Period shall commence when all mechanical, electrical, and control systems are installed and individual system start-up has been completed, or when an engine is first fired, whichever occurs first. The period shall terminate when the source has completed performance testing, is available for commercial operation, and has initiated sales to the power exchange. The commissioning period shall not exceed 180 days under any circumstances. The period shall be determined separately for each engine generator set.
CEM	Continuous Emission Monitor
CEC CPM:	California Energy Commission Compliance Program Manager
Engine Shutdown:	The time period corresponding to the control system request to shutdown a specific engine until the engine generator set ceases operation. The maximum time for a shutdown shall be 8.5 minutes.

Total Particulate Matter	Sum of the filterable and condensable fractions of an EPA Method 5/Method 202 (or other District approved method) sampling train. When using EPA Method 5/Method 202 to demonstrate compliance with these permit conditions, EPA Method 5/Method 202 shall be used to determine the stack gas concentration of particulate matter. The mass emission rate shall be calculated using EPA Method 19 to determine the stack gas flowrate during the source test run.
PM_{10}	Particulate matter with an aerodynamic diameter of 10 microns or smaller. As applicable, source test methods (District approved) must include the condensable fraction when measuring the stack gas particulate concentration and mass emission rate.
$PM_{2.5}$	Particulate matter with an aerodynamic diameter of 2.5 microns or smaller. As applicable, source test methods (District approved) must include the condensable fraction when measuring the stack gas particulate concentration and mass emission rate.
SO_2	Sulfur Dioxide (SO_2)

(B) Applicability:

Conditions 1 through 6 shall only apply during the commissioning period as defined above. Unless otherwise indicated, Conditions 7 through 25 shall apply after the commissioning period has ended. Conditions 26 through 30 shall apply at all times.

(C) Conditions:

Conditions for the Engines S-1 through S-14 during the Commissioning Period

1. The owner/operator of the Eastshore Energy Center (EEC) shall minimize emissions of carbon monoxide and nitrogen oxides from S-1 through S-14 Lean Burn Internal Combustion Engines to the maximum extent possible during the commissioning period.

   a. At the earliest feasible opportunity, in accordance with the recommendations of the equipment manufacturers and the construction contractor, the owner/operator shall tune each engine S-1 through S-14 after first fire to minimize the emissions of carbon monoxide and nitrogen oxides during commissioning.

   b. At the earliest feasible opportunity, in accordance with the recommendations of the equipment manufacturers and the construction contractor, the owner/operator shall install, adjust, and operate A-1 through A-14, SCR Systems, and A-15 through A-28, Oxidation Catalyst systems, to minimize the emissions during commissioning.

   c. The owner/operator of the EEC shall submit a plan to the District Engineering Division and the CEC CPM prior to the firing of any of the engines that shall describe the process to be followed during the commissioning of each engine. The plan shall include a description of each commissioning activity, the anticipated duration of each activity in hours, and the purpose of the activity. The activities described shall include, but not be limited to, engine tuning activities (such as air/fuel ratio settings, engine timing, turbocharger pressure); the installation, tuning, and operation of the SCR systems and oxidation catalysts; the installation, calibration, and testing of the CO and NO_x continuous emission monitors; and any activities requiring the firing of the IC engines without abatement by their respective abatement devices. None of the engines shall be fired sooner than 28 days after the District receives the commissioning plan.

   (Basis: BACT, Offsets)

2. During the commissioning period, the owner/operator of the EEC shall demonstrate compliance with Condition 6 through the use of properly operated and maintained continuous emission monitors and data recorders for the following parameters:
   a. Firing hours for each engine
   b. Fuel flow rates to each engine
   c. Stack gas nitrogen oxide emission concentrations at P-1 through P-14
   d. Stack gas carbon monoxide emission concentrations at P-1 through P-14
   e. Stack gas oxygen concentrations at P-1 through P-14

The monitored parameters shall be recorded at least once every 15 minutes (excluding normal calibration periods or when the monitored source is not in operation) for the engines. The owner/operator shall use District-approved methods to calculate heat input rates, NO_x mass emission rates, carbon monoxide mass emission rates, and NO_x and CO emission concentrations, summarized for each calendar day. All records shall be retained on site for at least 2 years from the date of entry and made available to District staff upon request.
(Basis: BACT, Offsets)

3. The owner/operator shall install, calibrate, and make operational continuous emission monitors for NO_x, CO and O_2 for each engine prior to first firing of that engine. After first firing of an individual engine, the detection range of the continuous emission monitor for that engine shall be adjusted as necessary to accurately measure the resulting range of CO and NO_x emission concentrations. The type, specifications, and location of these monitors shall be subject to District review and approval.
(Basis: BACT, Offsets)

4. The owner/operator shall operate the facility such that the total number of firing hours of each Engine S-1 through S-14 without abatement of nitrogen oxide and CO emissions by its SCR System and Oxidation Catalyst System shall not exceed 300 hours per engine during the commissioning period. Such operation of S-1 through S-14 without abatement shall be limited to discrete commissioning activities that can only be properly executed without the SCR or Oxidation Catalyst Systems fully operational. Upon completion of these activities, the owner/operator shall provide written notice to the District Engineering Division and Enforcement and Compliance Division and the unused balance of the 300 firing hours per engine without abatement shall expire.
(Basis: BACT, Offsets)

5. The owner/operator shall use District approved calculation methods to estimate the total mass emissions of NO_x (as NO_2), CO, POC, PM_{10}, and SO_2 that are emitted by Engines S-1 through S-14 and S-15 during the commissioning and facility startup period. These emissions count towards the consecutive twelve-month emission limitations specified in Condition 14. Emission totals shall include emissions during the startup and shutdown of the engines.
(Basis: BACT, Offsets)

6. The owner/operator shall not operate the engines S-1 through S-14 in a manner such that the combined pollutant emissions from these sources will exceed the following limits during the commissioning period. These emission limits shall include emissions resulting from the start-up and shutdown of the engines S-1 through S-14.

NO_x (as NO_2)	3058.4 pounds per calendar day
CO	4033.5 pounds per calendar day
POC (as CH_4)	975.1 pounds per calendar day
Total Particulate Matter	757.8 pounds per calendar day
PM_{10}	757.8 pounds per calendar day
$PM_{2.5}$	757.8 pounds per calendar day
SO_2	79.53 pounds per calendar day

(Basis: BACT, Offsets)

Conditions for the Engines S-1 through S-14 Post Commissioning Period

7. The owner/operator shall ensure that S-1 through S-14 IC Engines are fired on PUC natural gas exclusively. (Basis: BACT for PM_{10}, Cumulative Increase for SO_2)

8. The Owner/operator shall operate each engine such that the heat input rate for each engine S-1 through S-14 is less than or equal to 72.8 MMBtu/hr (HHV, 72.1 MMBtu/hr for Annual Average), averaged over an hour period, including startup/shutdown periods. The owner shall obtain heating value data for the natural gas on a monthly basis from the gas supplier. The heating value data shall be used to calculate a monthly average for heating value that may be used to demonstrate compliance with these conditions. (Basis: BACT, Cumulative Increase)

9. The Owner/operator shall operate each engine such that the heat input rate for each engine S-1 through S-14 is less than or equal to 1730 MMBTU/day per calendar day, including startups/shutdowns. (Basis: Cumulative Increase)

10. The Owner/operator shall operate each engine such that the heat input rate for all engines S-1 through S-14 combined is less than or equal to 4,036,480 MMBTU/yr on a rolling 12-month average basis, including startups/shutdowns. (Basis: Offsets)

11. The owner/operator shall limit the total annual operating hours for engines S-1 through S-14 to 56,000 hours. (Basis: Offsets, Cumulative Increase)

12. The owner/operator shall properly operate and maintain the A-1 to A-14 Selective Catalytic Reduction (SCR) Systems, except as provided during the Commissioning Period, whenever fuel is combusted at the corresponding source S-1 through S-14, respectively, and the individual catalyst bed has reached minimum operating temperature specified by the abatement device manufacturer. The owner/operator shall not inject ammonia into the SCR units (A-1 through A-14) until the catalyst bed reaches the minimum operating temperature specified by the abatement device manufacturer (Basis: BACT for NO_x).

13. The owner/operator shall ensure that the cumulative combined emissions from S-1 through S-14 Engines and S-15 do not exceed the following limits during any consecutive twelve-month period, including emissions generated during engine startups and shutdowns:
54.35 tons of NO_x (as NO_2) per rolling 12 month period;
84.45 tons of CO per rolling 12 month period;
76.11 tons of POC (as CH4) per rolling 12 month period;
40.31 tons of Total Particulate Matter per rolling 12 month period; and
40.31 tons of PM_{10} per rolling 12 month period; and
40.31 tons of $PM_{2.5}$ per rolling 12 month period; and
6.63 tons of SO_2 per rolling 12 month period.
(Basis: Offsets, Cumulative Increase)

14. The owner/operator shall comply with requirements (a) through (e) below under all operating scenarios, except during engine startup and shutdown (although startup and shutdown emissions shall be included in determining compliance with the facility-wide daily Total Particulate Matter emissions limit as set forth in subsection (c)).

(a) The nitrogen oxide concentration at each point P-1 through P-14 shall not exceed 5 ppmv, on a dry basis, corrected to 15% O_2, averaged over any 1-hour period. (Basis: BACT for NO_x)
(b) The carbon monoxide concentration at each point P-1 through P-14 shall not exceed 13 ppmv, on a dry basis, corrected to 15% O_2, averaged over any 1-hour period. (Basis: BACT for CO)
(c) Total Particulate Matter, PM_{10} and $PM_{2.5}$ emissions from any engine shall not exceed 1.3 lb/hr except as provided in Condition 16, and in any event shall not exceed 1.9 lb/hr. Total Particulate Matter, PM_{10}, and $PM_{2.5}$ emissions from all fourteen engines shall not exceed 461.65 lb/day. (Basis: BACT, Cumulative Increase)
(d) The POC concentration at each point P-1 through P-14 with the corresponding engine operating at 75% or more of full load shall not exceed 25 ppmv on a dry basis, corrected to 15% O_2, averaged over any 1-hour period. (Basis: BACT for POC)
(e) Ammonia (NH_3) emission concentrations at each point P-1 through P-14 shall not exceed 10 ppmv, on a dry basis, corrected to 15% O_2, averaged over any 3-hour period. The owner/operator shall quantify, by continuous recording, the ammonia injection rate to A-1 through A-14 SCR Systems. The correlation between the engine heat input and the SCR System ammonia injection rates as determined in accordance with Condition 18 shall be used to calculate the corresponding ammonia emission concentration at emission points P-1 through P-14. The facility will notify the Engineering Division Permit Evaluation Manager in writing when any engine operates for 3 consecutive hours at an average calculated ammonia slip rate equal to or greater than 10 ppmvd corrected to 15% O_2 (in addition to any reporting required by District Regulation 1). The notification shall be provided to the District within one week of an engine operating at an average calculated slip rate equal to or greater than 10 ppmvd corrected to 15% O_2. If the parametric monitoring indicates a corresponding ammonia slip of 10 ppm corrected to 15% O_2 for 3 consecutive hours, then the District may require a District approved source test for ammonia slip to demonstrate ongoing compliance and to update the parametric monitoring correlation as necessary. (Basis: Regulation 2, Rule 5)

15. The owner/operator shall demonstrate compliance with Conditions 13 and 14 by using properly operated and maintained continuous monitors during all hours of operation including equipment startup and shutdown periods for all of the following parameters:
(a) Firing Hours and Fuel Flow Rates for each source
(b) Carbon Dioxide (CO_2) or Oxygen (O_2) concentrations, Nitrogen Oxides (NO_x) concentrations, and Carbon Monoxide (CO) concentrations at emission points P-1 through P-14
(c) Ammonia injection rate at A-1 through A-14 SCR Systems
(d) Corrected NO_x concentrations, NO_x mass emissions (as NO_2), corrected CO concentrations, and CO mass emissions at each emission point for every 1-hour period
(e) Total Heat Input Rate for every clock hour
(f) The cumulative total Heat Input (MMBTU) for each calendar day for each engine
(g) Calculate NO_x mass emissions (as NO_2) and CO mass emissions, for each calendar day for each engine, and for the previous consecutive twelve-month period using CEM data.
(h) Calculate the mass emissions of PM-10, POC, and SO_2 for each calendar day for each engine and for the previous twelve-month period using District approved emission factors.
The owner/operator shall record all of the parameters identified in (a) through (c) above every fifteen (15) minutes (excluding normal calibration periods) and shall summarize all of the above parameters in accordance with the relevant permit limits. The owner/operator shall use the parameters measured pursuant to (a) through (c) above and District approved calculation methods to calculate the parameters identified in (d) through (h) above for each engine:
(Basis: 1-520.1, 9-9-501, BACT (except for SO_2), Offsets, Cumulative Increase)

16. The owner/operator shall demonstrate compliance with the 1.3 lb/hr Total Particulate Matter emissions limit in Condition 14(c) by performing tests for Total Particulate Matter emissions as required by these conditions. If Total Particulate Matter emissions for an engine generator set exceed 1.9 lb/hr, then that engine generator set shall be deemed to be in violation of Condition 14(c). If Total Particulate Matter emissions for any engine generator set exceed 1.3 lb/hr, but do not exceed 1.9 lb/hr, then that engine generator set shall not be considered to be in violation of Condition 14(c) if the owner/operator can demonstrate, subject to approval by the APCO, that the engine has been installed, operated, and maintained properly in accordance with all manufacturer's specifications and instructions. The owner/operator shall so demonstrate by:
(i) retesting emissions within 45 days after receiving the final test report from the initial test exceeding 1.3 lb/hr, unless the APCO determines that a retest for Total Particular Matter is not appropriate (in accordance with the source testing requirements set forth in Condition 20);
(ii) submitting to the APCO, within 30 days after receiving the final test report from the initial test exceeding 1.3 lb/hr, adequate documentation to verify that the engine has been installed, operated, and maintained properly in accordance with all manufacturers' specifications and instructions.

Within 30 days of receipt of the results of the retest and the documentation required by subsections (i) and (ii) above, the APCO shall make a determination whether the engine has been installed, operated, and maintained in accordance with manufacturers' specifications

and instructions. If the APCO determines that the engine has been properly installed, operated, and maintained, then the engine shall be deemed not to be in violation of the single-engine hourly emission limit in Condition 14(c) (although emission from the engine will still be counted for purposes of the facility-wide limit). If the APCO determines that the given engine has not been properly installed, operated, and maintained, then the engine shall be deemed to be in violation of Condition 14(c). Engines that operate pursuant to the provisions of this Condition 16 shall continue to be tested on a regular basis according to these Conditions.

17. Within 136 days of the beginning of the commissioning period for each engine at EEC, the Owner/operator shall conduct a District-approved initial source test for Total Particulate Matter, and POC on the corresponding emission point P-1 through P-14 with the corresponding source engine operating at least 80% of full load to determine compliance with these Permit Conditions. The Owner/operator shall conduct a District-approved initial source test for SO_2 on one of the fourteen emission points with the corresponding source engine operating at least 80% of full load to determine compliance with these Permit Conditions. (Basis: 2-1-411).

18. Prior to the end of the commissioning period, the Owner/operator shall conduct a District and CEC Compliance Program Manager (CPM) approved source test to establish emissions during startup and shutdown. The source test shall determine NO_x, CO, POC and PM_{10} emissions during cold startup of the engines. The source test shall measure PM_{10} emissions during a cold startup of no fewer than 3 engines; one 30 minute test run shall be conducted per engine. The source test shall determine NO_x, CO, and POC emissions during shutdown of the engines. The POC emissions shall be analyzed for methane and ethane to account for the presence of unburned natural gas. Twenty (20) working days before the execution of the source tests, the Owner/operator shall submit to the District and the CEC CPM a detailed source test plan designed to satisfy the requirements of this Condition, including specification of the number of tests. The Owner/operator shall notify the District and the CEC CPM at least seven (7) working days prior to the planned source testing date. Source test results shall be submitted to the District within 60 days of the date that source testing is completed at the facility.

19. The owner/operator shall conduct an initial District-approved source test to determine the SCR System ammonia injection rate and the corresponding NH_3 emission concentration at two of the fourteen emission points P-1 through P-14. The source test shall be conducted over the expected operating load range of the engines (including, but not limited to, 75% and 100% load) to establish the ammonia injection rates necessary to achieve NO_x emission limits while maintaining ammonia slip levels. A correlation between NO_x ppmv stack exit concentration, ammonia injection rate, heat input, and ammonia exit concentration shall be established for the two engines that were source tested. The test data shall be used as input for the calculation for the remaining engines. Ongoing compliance shall be demonstrated through calculations of corrected ammonia concentrations based upon the source test correlation and continuous records of ammonia injection rate. (Basis: Regulation 2, Rule 5).

20. The owner/operator shall obtain approval for all source test procedures from the Technical Services Division prior to conducting any tests. The owner/operator shall comply with all applicable testing requirements for continuous emission monitors as approved by the Technical

Services Division. Twenty (20) working days before the execution of source testing, the Owner/operator shall submit to the District and the CEC CPM a detailed source test plan designed to satisfy the requirements of any of these Conditions, including specification of the number of tests. The Owner/operator shall notify the District at least seven (7) working days prior to the planned source test date. Source test results shall be submitted to the District and the CEC CPM within 60 days of completing the tests.
(Basis: BACT)

21. The owner/operator shall conduct a District approved source test no later than 365 days after the initial Total Particulate Matter source test. The District approved source test shall determine the NH_3 emission concentration from two of the fourteen emission points to demonstrate ongoing compliance and to verify the parametric monitoring correlation. The District approved source test shall measure the Total Particulate Matter mass emission rate and POC emission concentration at emission points P-1 through P-14 with the corresponding source engine operating at least 80% of full load to determine compliance with these Permit Conditions. (Basis: Cumulative Increase, BACT)

22. After completion of the initial source test and the first annual source test, the owner/operator shall conduct a District approved source test on each engine every 8,760 hours of operation or every 3 years whichever comes first. The District approved source test shall determine the NH_3 emission concentration from two of the fourteen emission points to demonstrate ongoing compliance and to verify the parametric monitoring correlation. The District approved source test shall measure the Total Particulate Matter mass emission rate and POC emission concentration at emission points P-1 through P-14 with the corresponding source engine operating at least 80% of full load to determine compliance with these Permit Conditions. (Basis: Cumulative Increase, BACT)

23. The owner/operator shall not allow the maximum projected annual toxic air contaminant emissions from all emission points P-1 through P-14 combined to exceed the following limits:

1,3-Butadiene	872 pounds per year
Formaldehyde	11,200 pounds per year

unless the following requirement is satisfied:

The owner/operator shall perform a health risk assessment to determine the total facility risk using the emission rates determined by source testing and the most current Bay Area Air Quality Management District approved procedures and unit risk factors in effect at the time of the analysis. The owner/operator shall submit the risk analysis to the District and the CEC CPM within 60 days of the source test date. The owner/operator may request that the District and the CEC CPM revise the carcinogenic compound emission limits specified above. If the owner/operator demonstrates to the satisfaction of the APCO that these revised emission limits will not result in a significant cancer risk, the District and the CEC CPM may administratively adjust the carcinogenic compound emission limits listed above. (Basis: Regulation 2, Rule 5)

24. Within 136 days of start-up of the facility, the owner/operator shall conduct an initial District-approved source test on one of the fourteen emission points P-1 through P-14 with the corresponding engine operating at least 80% of full load to demonstrate compliance with Condition 23 and to demonstrate that the facility complies with Regulation 2, Rule 5. The initial District approved source test for toxic air contaminants shall quantify the emission rates from one engine of the following compounds: 1,3 Butadiene, Formaldehyde, Acetaldehyde, Benzene, Toluene, Xylene, and Polycyclic Aromatic Hydrocarbons. The toxic air contaminant source test results will be converted into emission factors in units of lb/MMBtu, and the annual firing rates for each of the fourteen engines will be used to calculate annual emissions of toxic air contaminants from the facility. The owner/operator shall use the results of the initial source test for toxic air contaminants to perform a health risk assessment to determine the total facility risk using District approved procedures and unit risk factors.
(Basis: Regulation 2, Rule 5)

25. The owner/operator shall conduct an additional District approved source test within 3 years of the initial test on one of the fourteen emission points P-1 through P-14 with the corresponding engine operating at least 80% of full load to demonstrate compliance with Condition 23. The toxic air contaminant source test results will be converted into emission factors in units of lb/MMBtu, and the annual firing rates for each of the fourteen engines will be used to calculate annual emissions of toxic air contaminants from the facility.
(Basis: Regulation 2, Rule 5)

Conditions for S-15 Emergency Standby Generator at all times

26. Operation of S-15 for reliability-related activities is limited to 50 hours per year. (Basis: Stationary Diesel Engine ATCM, 17 C.C.R. § 93115(e)(2)(A)(3).)

27. The owner/operator shall operate engine S-15 only for the following purposes: to mitigate emergency conditions, for emission testing to demonstrate compliance with a District, state or Federal emission limit, or for reliability-related activities (maintenance and other testing, but excluding emission testing). Operating hours while mitigating emergency conditions or while emission testing to show compliance with District, state or Federal emission limits is not limited. (Basis: Stationary Diesel Engine ATCM, 17 C.C.R. § 93115(e)(2)(A)(3).)

28. The owner/operator shall operate engine S-15 only when a non-resettable totalizing meter (with a minimum display capability of 9,999 hours) that measures the hours of operation for the engine is installed, operated and properly maintained. (Basis: Stationary Diesel Engine ATCM, 17 C.C.R. § (e)(4)(G)(1).)

29. Records: The owner/operator shall maintain the following monthly records in a District-approved log for at least 36 months from the date of entry. Log entries shall be retained on-site, either at a central location or at the engine's location, and made immediately available to the District staff upon request.
    a. Hours of operation of S-15 for reliability-related activities (maintenance and testing).
    b. Hours of operation of S-15 for emission testing to show compliance with emission limits.

c. Hours of emergency operation of S-15.
d. For each emergency, the nature of the emergency condition.
e. Fuel usage for S-15.

(Basis: Stationary Diesel Engine ATCM, 17 C.C.R. § 93115(e)(4)(I).)

30. At School and Near-School Operation: If S-15 is located on school grounds or within 500 feet of any school grounds, the owner/operator shall not operate it for non-emergency use, including maintenance and testing, during the following periods:
    a. Whenever a school-sponsored activity is taking place at the school (if the engine is located on school grounds).
    b. Between 7:30 a.m. and 3:30 p.m. on days when school is in session.

    "School" or "School Grounds" means any public or private school used for the purposes of the education of more than 12 children in kindergarten or any of grades 1 to 12, inclusive, but does not include any private school in which education is primarily conducted in a private home(s). "School" or "School Grounds" includes any building or structure, playground, athletic field, or other areas of school property but does not include unimproved school property. (Basis: Stationary Diesel Engine ATCM, 17 C.C.R. § 93115(e)(2)(A)(1).)

VI Recommendation

The APCO has concluded that the proposed Eastshore Energy Center power plant, which is composed of the proposed sources listed below, will comply with all applicable District rules and regulations. The following sources will be subject to the permit conditions and BACT and offset requirements discussed previously.

S-1 Natural Gas Fired Turbocharged Engine Generator Set, 8.4 MW (gross), 11,660 HP, Wartsila Model 20V34SG, abated by A-1 Selective Catalytic Reduction System and A-15 Oxidation Catalyst

S-2 Natural Gas Fired Turbocharged Engine Generator Set, 8.4 MW (gross), 11,660 HP, Wartsila Model 20V34SG, abated by A-2 Selective Catalytic Reduction System and A-16 Oxidation Catalyst

S-3 Natural Gas Fired Turbocharged Engine Generator Set, 8.4 MW (gross), 11,660 HP, Wartsila Model 20V34SG, abated by A-3 Selective Catalytic Reduction System and A-17 Oxidation Catalyst

S-4 Natural Gas Fired Turbocharged Engine Generator Set, 8.4 MW (gross), 11,660 HP, Wartsila Model 20V34SG, abated by A-4 Selective Catalytic Reduction System and A-18 Oxidation Catalyst

S-5 Natural Gas Fired Turbocharged Engine Generator Set, 8.4 MW (gross), 11,660 HP, Wartsila Model 20V34SG, abated by A-5 Selective Catalytic Reduction System and A-19 Oxidation Catalyst

S-6 Natural Gas Fired Turbocharged Engine Generator Set, 8.4 MW (gross), 11,660 HP, Wartsila Model 20V34SG, abated by A-6 Selective Catalytic Reduction System and A-20 Oxidation Catalyst

S-7 Natural Gas Fired Turbocharged Engine Generator Set, 8.4 MW (gross), 11,660 HP, Wartsila Model 20V34SG, abated by A-7 Selective Catalytic Reduction System and A-21 Oxidation Catalyst

S-8 Natural Gas Fired Turbocharged Engine Generator Set, 8.4 MW (gross), 11,660 HP, Wartsila Model 20V34SG, abated by A-8 Selective Catalytic Reduction System and A-22 Oxidation Catalyst

S-9 Natural Gas Fired Turbocharged Engine Generator Set, 8.4 MW (gross), 11,660 HP, Wartsila Model 20V34SG, abated by A-9 Selective Catalytic Reduction System and A-23 Oxidation Catalyst

S-10 Natural Gas Fired Turbocharged Engine Generator Set, 8.4 MW (gross), 11,660 HP, Wartsila Model 20V34SG, abated by A-10 Selective Catalytic Reduction System and A-24 Oxidation Catalyst

S-11 Natural Gas Fired Turbocharged Engine Generator Set, 8.4 MW (gross), 11,660 HP, Wartsila Model 20V34SG, abated by A-11 Selective Catalytic Reduction System and A-25 Oxidation Catalyst

S-12 Natural Gas Fired Turbocharged Engine Generator Set, 8.4 MW (gross), 11,660 HP, Wartsila Model 20V34SG, abated by A-12 Selective Catalytic Reduction System and A-26 Oxidation Catalyst

S-13 Natural Gas Fired Turbocharged Engine Generator Set, 8.4 MW (gross), 11,660 HP, Wartsila Model 20V34SG, abated by A-13 Selective Catalytic Reduction System and A-27 Oxidation Catalyst

S-14 Natural Gas Fired Turbocharged Engine Generator Set, 8.4 MW (gross), 11,660 HP, Wartsila Model 20V34SG, abated by A-14 Selective Catalytic Reduction System and A-28 Oxidation Catalyst

S-15 Emergency Standby Generator Set; Diesel Engine; Caterpillar Model C9ATAAC, 369 HP

The proposed facility will also include the following exempt equipment:

Natural Gas Fired Heaters to Heat Incoming Natural Gas Feed to each Engine Generator Set, Max Firing Rate 2.0 MMBtu/hr.

The natural gas fired heaters are exempt from District permit requirements per Regulation 2, Rule 1, Section 114.

Pursuant to District Regulation 2-3-404, this document has satisfied the public notice, public comment, and public inspection requirements of Regulation 2-3-404, 2-2-406 and 2-2-407. Accordingly, a notice inviting written public comment was published on April 28, 2007 in the Oakland Tribune, a newspaper of general circulation in the area of the proposed Eastshore Energy Center Project. The public inspection and comment period ended on June 2, 2007. All written comments received were responded to in writing.

Jack P. Broadbent
Executive Officer/Air Pollution Control Officer

Bay Area Air Quality Management District
939 Ellis Street
San Francisco CA 94109

VII Glossary

BTU	British Thermal Unit
AFC	Application for Certification
BAAQMD	Bay Area Air Quality Management District
BACT	Best Available Control Technology
CARB	California Air Resources Board
CEC	California Energy Commission
CEC CPM	California Energy Commission, Compliance Program Manger
CO	Carbon Monoxide
EO/APCO	Executive Officer/Air Pollution Control Officer
NH_3	Ammonia
NMHC	Non-methane Hydrocarbons
NO_x	Nitrogen Oxides
O_2	Oxygen
PDOC	Preliminary Determination of Compliance
PM_{10}	Particulate Matter with an aerodynamic diameter of 10 Microns or less
$PM_{2.5}$	Particulate Matter with an aerodynamic diameter of 2.5 Microns or less
POC	Precursor Organic Compounds
ppmvd	Parts Per Million by Volume, Dry
PSD	Prevention of Significant Deterioration
PUC	Public Utilities Commission
SCAQMD	South Coast Air Quality Management District
SCR	Selective Catalytic Reduction
SJVAPCD	San Joaquin Valley Air Pollution Control District
SO_2	Sulfur Dioxide
TAC	Toxic Air Contaminant
TBACT	Toxics Best Available Control Technology
VOC	Volatile Organic Compounds

APPENDIX A

Emission Calculations

Emission Factors for S-1 through S-14			
Pollutant	Source	Value	Unit
NOx	Applicant Proposed Permit Limit of 5 ppm	0.01842	lb/MMBtu
CO	Applicant Proposed Permit Limit of 13 ppm	0.02915	lb/MMBtu
POC	Applicant Proposed Permit Limit of 25 ppm (annual average)	0.03203	lb/MMBtu
PM10	Average Emission Rate for Normal Operations	1.3	lb/hr
PM10	Maximum Emission Rate for Normal Operations	1.9	lb/hr
SO2	Total Sulfur in Natural Gas 0.0367 lb/hr, Lube Oil Combustion 0.2 lb/hr	0.2367	lb/hr

Emission Factor Derivation

NOx lb/MMBtu = ppm x 1/molar volume x MW x Fd x 20.9/(20.9 - %O2)

ppm = 5 ppm @15%O2 limit proposed by Applicant
molar volume = 386.8 dscf/lbmol @ 14.696 psia, 70 deg. F
MW = molecular weight, lb/lb-mol
Fd = 8743 dscf/MMBtu for 1050 Btu/scf Natural Gas @ 70 deg F

NOx lb/MMBtu = 5 E-06 ft3 of NOx/ft3 stack gas x 1/386.8 dscf/lb-mol x 46 lb/lb-mol x 8743 dscf/MMBtu x 20.9/(20.9 - 15)
NOx lb/MMBtu = 0.01842

CO lb/MMBtu = ppm x 1/molar volume x MW x Fd x 20.9/(20.9 - %O2)

ppm = 13 ppm @ 15% O2 limit proposed by Applicant
molar volume = 386.8 dscf/lbmol @ 14.7 psia, 70 deg. F
MW = molecular weight, lb/lb-mol
Fd = 8743 dscf/MMBtu for 1050 Btu/scf Natural Gas @ 70 deg F

CO lb/MMBtu = 13 E-06 ft3 of CO/ft3 stack gas x 1/386.8 dscf/lb-mol x 28 lb/lb-mol x 8743 dscf/MMBtu x 20.9/(20.9 - 15)
CO lb/MMBtu = 0.02915

POC lb/MMBtu = ppm x 1/molar volume x MW x Fd x 20.9/(20.9 - %O2)

ppm = 25 ppm @ 15% O2 (annual average) limit proposed by Applicant
molar volume = 386.8 dscf/lbmol @ 14.7 psia, 70 deg. F
MW = molecular weight, lb/lb-mol
Fd = 8743 dscf/MMBtu for Natural Gas

POC lb/MMBtu = 25 E-06 ft3 of POC/ft3 stack gas x 1/386.8 dscf/lb-mol x 16 lb/lb-mol x 8743 dscf/MMBtu x 20.9/(20.9 - 15)
POC lb/MMBtu = 0.03203

SOx lb/hr (as SO2)
Natural Gas 0.182 grains of S/100 scf
Natural Gas Combustion Portion
SO2 = (0.182 gr/100 scf)(lb/7000 gr)(1/1020 BTU/scf)(1 x 10E6 Btu/MMBtu)(64 lb SO2/32 lb S) = 0.0005098 lb/MMBtu
SO2 = (0.0005098 lb/MMBtu)(72.08 MMBtu/hr) = 0.0367 lb/hr
Lube Oil Portion
SO2 = 0.2 lb/hr

Engine Firing Rate:			
Annual	72.08	MMBTU/hr	Design data (8439 kW and 8541 BTU/kW)
Short Term	72.80	MMBTU/hr	Design data + 1% margin

	Cold Catalyst Start		
Pollutant	(kg/event)	(lb/event)	
NOx	4	8.818	Manufacturer Estimate - 30 minutes operation after 6 hr downtime
CO	6	13.228	Manufacturer Estimate - 30 minutes operation after 6 hr downtime
POC	3	6.614	Manufacturer Estimate - 30 minutes operation after 6 hr downtime
PM10	1.1	2.425	Manufacturer Estimate - 30 minutes operation after 6 hr downtime
SO2		0.1184	Based on 30 minutes at full load

	Warm Catalyst Start		
Pollutant	(kg/event)	(lb/event)	
NOx	1.1	2.425	Manufacturer Estimate - 15 minutes operation
CO	1	2.205	Manufacturer Estimate - 15 minutes operation
POC	0.8	1.764	Manufacturer Estimate - 15 minutes operation
PM10	0.9	1.984	Manufacturer Estimate - 15 minutes operation
SO2		0.0592	Based on 15 minutes at full load

	Normal	Shutdown	
Pollutant	(lb/hr)	(lb/event)	
NOx	1.328	0.188	Based on 8.5 minutes at full load
CO	2.1	0.298	Based on 8.5 minutes at full load
POC	2.3	0.326	Based on 8.5 minutes at full load
PM10	1.9	0.269	Based on 8.5 minutes at full load
SO2	0.2367	0.0335	Based on 8.5 minutes at full load

PM10 at 1.9 lb/hr is the maximum allowed by permit during normal operation.

TOTAL CRITERIA POLLUTANT EMISSONS FROM THE FACILITY – AIR TOXICS EMISSIONS NOT INCLUDED

Pollutant	One Engine Normal Operation Emissions (ton/yr)	One Engine Startup/Shutdown Emissions (ton/yr)	One Engine Total Emissions (ton/yr)
NOx	2.528	1.351	3.879
CO	4.000	2.029	6.029
POC	4.395	1.041	5.436
PM10	2.475	0.404	2.879
SOx	0.451	0.023	0.473

Pollutant	14 Engines Normal Operation Emissions (ton/yr)	14 Engines Startup/Shutdown Emissions (ton/yr)	14 Engines Total Emissions (ton/yr)	Emergency Standby Generator Emissions (ton/yr)	Total Project Emissions (ton/yr)	Offset Ratio	Offset (ton/yr)
NOx	35.387	18.913	54.299	0.053	54.353	1.15	62.506
CO	56.000	28.405	84.405	0.047	84.452	NA	
POC	61.533	14.574	76.107	0.0028	76.110	1.15	87.527
PM10	34.648	5.657	40.306	0.0023	40.308	NA	
SOx	6.309	0.319	6.628	0.00011	6.628	NA	

ANNUAL CRITERIA POLLUTANT EMISSIONS FROM NORMAL OPERATIONS – NO STARTUP/SHUTDOWN EMISSIONS

Pollutant	Value	Unit	One Engine Maximum Firing Rate (MMBtu/hr)	One Engine Normal Operation Emissions (lb/hr)	One Engine Normal Operation Emissions (lb/day)	Maximum Operation (hr/yr)	One Engine Normal Operation Emissions (lb/yr)	One Engine Normal Operation Emissions (ton/yr)
NOx	0.01842	lb/MMBtu	72.08	1.328	31.87	3807.5	5055.27	2.528
CO	0.02915	lb/MMBtu	72.08	2.101	50.43	3807.5	8000.06	4.000
POC	0.03203	lb/MMBtu	72.08	2.309	55.41	3807.5	8790.46	4.395
PM10	1.3	lb/hr		1.3	31.20	3807.5	4949.75	2.475
SOx	0.2367	lb/hr		0.2367	5.68	3807.5	901.24	0.451

Commisioning Period Emissions and Startup/Shutdown Emissions Not Included
Operation Hours = 4000 hours - 192.5 hours for Startup/Shutdown = 3807.5 hours

Pollutant	Value	Unit	One Engine Maximum Firing Rate (MMBtu/hr)	One Engine Normal Operation Emissions (lb/hr)	14 Engines Normal Operation Emissions (lb/day)	Maximum Operation (hr/yr)	14 Engines Normal Operation Emissions (lb/yr)	14 Engines Normal Operation Emissions (ton/yr)
NOx	0.01842	lb/MMBtu	72.08	1.328	446.11	3807.5	70773.77	35.387
CO	0.02915	lb/MMBtu	72.08	2.101	705.98	3807.5	112000.84	56.000
POC	0.03203	lb/MMBtu	72.08	2.309	775.73	3807.5	123066.45	61.533
PM10	1.3	lb/hr		1.3	436.80	3807.5	69296.50	34.648
SOx	0.2367	lb/hr		0.2367	79.53	3807.5	12617.29	6.309

Commisioning Period Emissions and Startup/Shutdown Emissions Not Included
Operation Hours = 4000 hours - 192.5 hours for Startup/Shutdown = 3807.5 hours

STARTUP/SHUTDOWN CRITERIA POLLUTANT EMISSIONS

Pollutant	Cold Catalyst Start (lb/event)	Warm Catalyst Start (lb/event)	Shutdown (lb/event)	One Engine Maximum Cold Startups (event)	One Engine Maximum Cold Shutdowns (event)	One Engine Startup Emissions (lb/yr)	One Engine Shutdown Emissions (lb/yr)	One Engine Startup/Shutdown Emissions (lb/yr)	One Engine Startup/Shutdown Emissions (ton/yr)
NOx	8.818	2.425	0.188	300	300	2645.40	56.40	2701.80	1.351
CO	13.228	2.205	0.298	300	300	3968.40	89.40	4057.80	2.029
POC	6.614	1.764	0.326	300	300	1984.20	97.80	2082.00	1.041
PM10	2.425	1.984	0.269	300	300	727.50	80.70	808.20	0.404
SOx	0.1184	0.0592	0.0335	300	300	35.52	10.05	45.57	0.023

Notes:

SOx emissions estimates are based on a maximum hourly emission rate of 0.2367 lb/hr. SOx emissions will remain at a simular level during startup and shutdown.

Worst case assumption 300 coldstarts per year for each engine.

One Cold Start/Shutdown Cycle (30 min startup, 8.5 min shutdown) and One Warm Start/Shutdown Cycle (15 min for startup, 8.5 min for shutdown)

Pollutant	Cold Catalyst Start (lb/event)	Warm Catalyst Start (lb/event)	Shutdown (lb/event)	14 Engines Maximum Cold Startups (event)	14 Engines Maximum Cold Shutdowns (event)	14 Engines Startup Emissions (lb/yr)	14 Engines Shutdown Emissions (lb/yr)	14 Engines Startup/Shutdown Emissions (lb/yr)	14 Engines Startup/Shutdown Emissions (ton/yr)
NOx	8.818	2.425	0.188	4200	4200	37035.60	789.60	37825.20	18.913
CO	13.228	2.205	0.298	4200	4200	55557.60	1251.60	56809.20	28.405
POC	6.614	1.764	0.326	4200	4200	27778.80	1369.20	29148.00	14.574
PM10	2.425	1.984	0.269	4200	4200	10185.00	1129.80	11314.80	5.657
SOx	0.1184	0.0592	0.0335	4200	4200	497.28	140.70	637.98	0.319

Notes:

SOx emissions estimates are based on a maximum hourly emission rate of 0.2367 lb/hr. SOx emissions will remain at a simular level during startup and shutdown.

Worst case assumption 300 coldstarts per year for each engine.

One Cold Start/Shutdown Cycle (30 min startup, 8.5 min shutdown) and One Warm Start/Shutdown Cycle (15 min for startup, 8.5 min for shutdown)

MAXIMUM HOURLY EMISSIONS FOR NATURAL GAS FIRED ENGINE GENERATOR SETS

Max Hourly Emissions - One Cold Start (30 minutes for startup)

Pollutant	Normal Operation (lb/hr)	Normal Operation (hour/day)	Cold Startup (lb/event)	Startup (event)	Shutdown (lb/event)	Number Shutdown (event)	One Engine Total (lb/hr)	14 Engines Total (lb/hr)
NOx	1.328	0.5	8.818	1	0.188	0	9.48	132.75
CO	2.101	0.5	13.228	1	0.298	0	14.28	199.90
POC	2.309	0.5	6.614	1	0.327	0	7.77	108.76
PM10	1.900	0.5	2.425	1	0.269	0	3.38	47.25
SO2	0.2367		0.1184		0.0335		0.2367	3.31

PM10 at Maximum lb/hr allowed by Permit. Facility must comply with more stringent daily PM10 cap.

MAXIMUM DAILY EMISSIONS FOR NATURAL GAS FIRED ENGINE GENERATOR SETS

Max Daily Emissions For One Engine - One Cold Start (30 min startup)

Pollutant	Normal Operation (lb/hr)	Normal Operation (hour/day)	Cold Startup (lb/event)	Cold Startup (event)	Warm Startup (lb/event)	Warm Startup (event)	Shutdown (lb/event)	Number Shutdown (event)	Total (lb/day)
NOx	1.328	23.50	8.818	1	2.425	0	0.188	0	40.03
CO	2.101	23.50	13.228	1	2.205	0	0.298	0	62.60
POC	2.309	23.50	6.614	1	1.764	0	0.326	0	60.88
PM10	1.900	23.50	2.425	1	1.984	0	0.269	0	47.08
SO2	0.2367	24	0.118		0.059		0.034		5.68

Max Daily Emissions For All 14 Engines - One Cold Start (30 min startup)

Pollutant	Normal Operation (lb/hr)	Normal Operation (hour/day)	Cold Startup (lb/event)	Cold Startup (event)	Warm Startup (lb/event)	Warm Startup (event)	Shutdown (lb/event)	Number Shutdown (event)	One Engine Total (lb/day)	14 Engines Total (lb/day)
NOx	1.328	23.50	8.818	1	2.425	0	0.188	0	40.03	560.364
CO	2.101	23.50	13.228	1	2.205	0	0.298	0	62.60	876.421
POC	2.309	23.50	6.614	1	1.764	0	0.326	0	60.88	852.257
PM10	1.300	23.50	2.425	1	1.984	0	0.269	0	32.98	461.650
SO2	0.2367	24	0.118		0.059		0.034		5.68	79.531

PM10 Maximum Daily based on 1.3 lb/hr for all 14 engines + 1 cold start

Diesel Engine Emissons (S-15)

BAAQMD Final, 3/23/07

Rated Horsepower: **369** Nameplate

	g/kw-hr	(g/hp-hr)
NOx	3.5150	2.6211
CO	3.1000	2.3117
POC	0.1850	0.1380
PM_{10}	0.1500	0.1119
SO_2	0.0074	0.0055

g/kw-hr

NOx & POC

3.7

95% NOx

5% POC

Pollutants	Factors	hp	Hours	lb/g	lbs/yr	TPY
NOx	= (2.6211 g/hp-hr)*	(369 hp)*	(50 hrs/yr)*	(0.00220 lbs/g)	= 106.61 lbs/yr	= 0.053 TPY
CO	= (2.3117 g/hp-hr)*	(369 hp)*	(50 hrs/yr)*	(0.00220 lbs/g)	= 94.03 lbs/yr	= 0.047 TPY
POC	= (0.1380 g/hp-hr)*	(369 hp)*	(50 hrs/yr)*	(0.00220 lbs/g)	= 5.61 lbs/yr	= 0.003 TPY
PM_{10}	= (0.1119 g/hp-hr)*	(369 hp)*	(50 hrs/yr)*	(0.00220 lbs/g)	= 4.55 lbs/yr	= 0.002 TPY
SO_2	= (0.0055 g/hp-hr)*	(369 hp)*	(50 hrs/yr)*	(0.00220 lbs/g)	= 0.22 lbs/yr	= 0.000 TPY

Pollutants	Factors	hp	hr/day	lb/g	lbs/day
NOx	= (2.6211 g/hp-hr)*	(369 hp)*	(24 hr/day)*	(0.00220 lbs/g)	= 51.175 lbs/day
CO	= (2.3117 g/hp-hr)*	(369 hp)*	(24 hr/day)*	(0.00220 lbs/g)	= 45.133 lbs/day
POC	= (0.1380 g/hp-hr)*	(369 hp)*	(24 hr/day)*	(0.00220 lbs/g)	= 2.693 lbs/day
PM_{10}	= (0.1119 g/hp-hr)*	(369 hp)*	(24 hr/day)*	(0.00220 lbs/g)	= 2.184 lbs/day
SO_2	= (0.0055 g/hp-hr)*	(369 hp)*	(24 hr/day)*	(0.00220 lbs/g)	= 0.107 lbs/day

Grain Loading Calculation for a Single Engine

PM-10 Maximum Emission Rate 1.9 lb/hr
Firing Rate 72.8 MMBtu/hr
F-factor 8743 dscf/MMBtu
lb = 7000 grains
Regulation 6 O2 Concentration 6%
Ambient Air O2 Concentration 20.9%

grains/dscf = (1.9 lb/hr x 7000 grains/lb)/(72.8 MMBtu/hr x (8743 dscf/MMBtu x 20.9/(20.9 - 6))

grains/dscf = 0.015

PM10 at Maximum lb/hr allowed by permit.

COMMISSIONING EMISSION FACTORS (PER ENGINE)

Fuel Consumption Assumptions:

kW load	kW (full load)	kW	kJ/kWh	kJ/Btu	Btu/kWh	MMBtu/hr	Btu load
100%	8439	8439	9010	1.055	8541	72.08	100%
90%	8439	7595	9101	1.055	8627	65.52	90.9%
75%	8439	6329	9330	1.055	8844	55.97	77.6%
50%	8439	4198	10114	1.055	9587	40.25	55.8%

Note: kJ/kWh at various loads provided by vendor.

Emission Factor Assumptions:

molar volume =	386.8	dscf/lbmol @ 14.696 psia, 70 deg. F
Fd =	8743	dscf/MMBtu for 1050 Btu/scf Natural Gas @ 70 deg F
MW (molecular weight) =	46	lb NOx/lb-mol
MW (molecular weight) =	28	lb CO/lb-mol
MW (molecular weight) =	16	lb POC/lb-mol
Reference Oxygen	15	%
Ambient Oxygen	20.9	%

Commissioning

Pollutant	100% Load Emission Rate		90% Load Emission Rate		75% Load Emission Rate		50% Load Emission Rate	
	(ppm)	(lb/hr)	(ppm)	(lb/hr)	(ppm)	(lb/hr)	(ppm)	(lb/hr)
NOx	120	31.86	120	28.96	110	22.68	100	14.82
CO	260	42.02	260	38.19	300	37.64	400	36.10
POC	110	10.16	110	9.23	140	10.04	170	8.77
*PM10		1.9		1.9		1.9		1.9
*SOx		0.237		0.237		0.237		0.237

Note: ppm at various loads provided by vendor.

No change assumed for PM10 and SOx emissions. PM10 based on vendor guarantee. SOx based on 0.182 g S/100 scf + 0.2 lb/hr from lube oil.

Worst Case Maximum Daily Emissions for Commissioning Period for Natural Gas Fired Engine Generator Sets

Commissioning						
Pollutant	# Engines	Per Engine (lb/hr)	All Engine (lb/hr)	Operation (hr/day)	Per Engine (lb/day)	Total (lb/day)
NOx	4	31.86	127.43	24	764.60	3,058.39
CO	4	42.02	168.06	24	1,008.38	4,033.53
POC	4	10.16	40.63	24	243.78	975.14
*PM10	4	1.90	7.60	24	45.60	182.40
*SOx	4	0.237	0.95	24	5.69	22.75

For NOx, CO, and POC worst case commissioning emissions occur with 4 engines operating uncontrolled at 100% load.
For PM10 and SOx worst case commissioning are the same as post commissioning emissions with 14 engines operating at 100% load.

Commissioning Period Max Daily Emissions For One Engine (Engine With Controls) - One Cold Start (30 min startup)

Pollutant	Normal Operation (lb/hr)	Normal Operation (hour/day)	Cold Startup (lb/event)	Cold Startup (event)	Warm Startup (lb/event)	Warm Startup (event)	Shutdown (lb/event)	Number Shutdown (event)	Total (lb/day)
NOx	1.33	23.5	8.82	1	2.43	0	0.188	0	40.02
CO	2.10	23.5	13.23	1	2.20	0	0.298	0	62.60
POC	2.31	23.5	6.61	1	1.76	0	0.327	0	60.87
PM10	1.90	23.5	2.43	1	1.98	0	0.312	0	54.13
SO2	0.24	24	0.12		0.0592		0.0335		5.68

Commissioning Period Max Daily Emissions For 14 Engines (Engines With Controls) - One Cold Start (30 min startup)

Pollutant	One Engine Total (lb/day)	14 Engines Total (lb/day)
NOx	40.02	560.27
CO	62.60	876.46
POC	60.87	852.16
PM10	54.13	757.75
SO2	5.68	79.53

TOXIC AIR CONTAMINANT EMISSION ESTIMATE FOR FACILITY

Toxic Air Contaminant	Uncontrolled Emission Factor (lb/MMBtu)	Max Firing Rate 14 Engines (MMBtu/hr)	Max Firing Rate 14 Engines (MMBtu/yr)	Abatement Efficiency Oxidation Catalyst (%)	Total Project Emissions (lb/hr)	Acute Risk Screening Trigger Level (lb/hr)	Total Project Emissions (lb/yr)	Chronic Risk Screening Trigger Level (lb/yr)
1,3-Butadiene	3.60E-04	1019.2	4036480	40	2.20E-01	None	8.72E+02	1.10E+00
Acetaldehyde	5.19E-04	1019.2	4036480	40	3.17E-01	None	1.26E+03	6.40E+01
Acrolein	5.78E-05	1019.2	4036480	40	3.53E-02	4.20E-04	1.40E+02	2.30E+00
Ammonia	1.36E-02	1019.2	4036480	0	1.39E+01	7.10E+00	5.49E+04	7.70E+03
Benzene	2.14E-04	1019.2	4036480	40	1.31E-01	2.90E+00	5.18E+02	6.40E+00
Benzo-a-anthracene	5.76E-08	1019.2	4036480	40	3.52E-05	None	1.40E-01	None
Benzo-a-pyrene	2.65E-09	1019.2	4036480	40	1.62E-06	None	6.42E-03	1.10E-02
Benzo-b-fluoranthene	4.01E-08	1019.2	4036480	40	2.45E-05	None	9.71E-02	None
Benzo-k-fluoranthene	7.68E-09	1019.2	4036480	40	4.70E-06	None	1.86E-02	None
Chrysene	1.40E-08	1019.2	4036480	40	8.56E-06	None	3.39E-02	None
Dibenz-ah-anthracene	2.65E-09	1019.2	4036480	40	1.62E-06	None	6.42E-03	None
Ethylbenzene	6.97E-05	1019.2	4036480	40	4.26E-02	None	1.69E+02	7.70E+04
Formaldehyde	4.62E-03	1019.2	4036480	40	2.83E+00	2.10E-01	1.12E+04	3.00E+01
Indeno-123cd-pyrene	7.03E-09	1019.2	4036480	40	4.30E-06	None	1.70E-02	None
Naphthalene	2.46E-05	1019.2	4036480	40	1.50E-02	None	5.96E+01	None
Propylene	5.27E-03	1019.2	4036480	40	3.22E+00	None	1.28E+04	1.20E+05
Toluene	2.34E-04	1019.2	4036480	40	1.43E-01	8.20E+01	5.67E+02	1.20E+04
Xylenes	6.33E-04	1019.2	4036480	40	3.87E-01	4.90E+01	1.53E+03	2.70E+04
Diesel Exhaust Particulate					9.10E-02	None	4.55E+00	5.80E-01

AMMONIA SLIP EMISSION ESTIMATE FOR NATURAL GAS FIRED ENGINE GENERATOR SETS

Ammonia lb/MMBtu = ppm x 1/molar volume x MW x Fd x 20.9/(20.9 - %O2)

ppm = 10 ppm @15%O2 limit
molar volume = 386.8 dscf/lbmol @ 14.696 psia, 70 deg. F
MW = molecular weight, lb/lb-mol
Fd = 8743 dscf/MMBtu for Natural Gas @ 70 deg. F

Ammonia lb/MMBtu = 10 E-06 ft3 of NH3/ft3 stack gas x 1/386.8 dscf/lb-mol x 17 lb/lb-mol x 8743 dscf/MMBtu x 20.9/(20.9 - 15)
Ammonia lb/MMBtu = 0.02722 0.01361

Pollutant	Value	Unit	One Engine Maximum Firing Rate (MMBtu/hr)	One Engine Normal Operation Emissions (lb/hr)	One Engine Normal Operation Emissions (lb/day)	Maximum Operation (hr/yr)	One Engine Normal Operation Emissions (lb/yr)	One Engine Normal Operation Emissions (ton/yr)
Ammonia	0.01361	lb/MMBtu	72.08	0.98	23.54	4000	3924.04	1.96

Commisioning Period Emissions and Startup/Shutdown Emissions Not Included

Pollutant	Value	Unit	14 Engines Maximum Firing Rate (MMBtu/hr)	14 Engines Normal Operation Emissions (lb/hr)	14 Engines Normal Operation Emissions (lb/day)	Per Engine Maximum Operation (hr/yr)	14 Engines Normal Operation Emissions (lb/yr)	14 Engines Normal Operation Emissions (ton/yr)
Ammonia	0.01361	lb/MMBtu	1009.12	13.73	329.62	4000	54936.49	27.47

Commisioning Period Emissions and Startup/Shutdown Emissions Not Included

APPENDIX B

Health Risk Screening Results

- INTEROFFICE MEMORANDUM
Revised – April 19, 2007

TO: **Brian Lusher**

Via: **Scott B. Lutz**
Daphne Y. Chong
Glen Long

FROM: **Irma Salinas**

SUBJECT: **Results of Health Risk Screening Analysis for Eastshore Energy Center (Hayward, CA), Standby Generator Diesel Engine, and 14 Natural Gas Engines Plant #18041, Application #15195**

Per your request, we have completed a health risk screening analysis for the above referenced permit application. The analysis estimates the incremental health risk resulting from toxic air contaminant (TAC) emissions from operation of a standby generator diesel engine and 14 natural gas engines at this facility. Results from the health risk screening analysis indicate that the maximum cancer risk is estimated at 3.9 in a million. In accordance with the District's Regulation 2-5, this risk level is considered acceptable as the engine meets current TBACT requirements.

EMISSIONS: The emission rates for toxic air contaminants (TAC) were calculated based on the following assumptions:

1. Each IC Engine will operate intermittently (4000 hours per year) at a firing rate of 72.8 MMBTU/hr. There are a total of 14 engines. TAC emissions estimates were made using emission factors from the CARB CATEF database for Natural Gas Fired IC Engines >650 hp, lean-burn engines. The engines will have an abatement efficiency of 40% (Oxidation Catalyst). See Table #1

2. Diesel Engine will operate 50 hours for testing and maintenance purposes, 369 BHP hr,

Source	PM Emission Factor (g/bhp-hr)	Horsepower	Annual Usage (hours/year)	Diesel PM Emissions (lb/year)
S15	0.1118	369	50	4.5434

MODELING: The ISCST3 air dispersion computer model was used to estimate annual average and maximum 1-hour ambient air concentrations. The model was run with Union City (5 year) meteorological data, emission rate scalars to account for operations that occur only during normal working hours and Hayward terrain data. Model runs were made with urban dispersion coefficients. In addition, to be more conservative a gradual plume rise was used. Stack and building parameters for the analysis were based on information provided by the applicant.

HEALTH RISK: Estimates of residential risk assume potential exposure to annual average TAC concentrations occur 24 hours per day, 350 days per year, for a 70-year lifetime. Risk estimates for offsite workers assume potential exposure occurs 8 hours per day, 245 day per year, for 40 years. The estimated health risks for this permit application are presented in the table below.

Sources 1-14 (Natural Gas Engines)

Receptor	Cancer Risk	Non-cancer Chronic Hazard Index (HI)	Max. Acute Non-cancer HI
Resident	0.32 in a million	0.005	0.028
Worker	3.54 in a million	0.065	0.066

Source 15 (Diesel Engine)

Receptor	Cancer Risk	Non-cancer Chronic Hazard Index (HI)
Resident	0.0113 in a million	0.0000068
Worker	0.63 in a million	0.00045

Sources 1-15 Cumulative at maximum point of impact

Receptor	Cancer Risk	Non-cancer Chronic Hazard Index (HI)	Max. Acute Non-cancer HI
Resident	0.3305 in a million	0.0050	0.028
Worker	3.856 in a million	0.06522	0.066

Including the compound Acrolein, the results are as follows:

Sources 1-14 (Natural Gas Engines)

Receptor	Cancer Risk	Non-cancer Chronic Hazard Index (HI)	Max. Acute Non-cancer HI
Resident	0.32 in a million	0.008	0.201
Worker	3.54 in a million	0.104	0.470

No Change in the diesel engine

Sources 1-15 Cumulative at maximum point of impact

Receptor	Cancer Risk	Non-cancer Chronic Hazard Index (HI)	Max. Acute Non-cancer HI
Resident	0.3305 in a million	0.0080	0.201
Worker	3.856 in a million	0.10422	0.470

Potential hours/yr 8760
Operating hours/yr Maximum 4000

Table #1

SUBSTANCE	MEAN lbs/MMCF	lbs/MMBtu	lbm/hr	lbm/hr after Abatement	g/sec 1 hr max	lbm/yr	lbm/yr after abatement	g/sec - Annual
Ammonia	1.39E+01	1.36E-02	9.91E-01	9.908E-01	1.248E-01	3.96E+03	3963.232	5.700E-02
1,3-Butadiene	3.67E-01	3.60E-04	2.62E-02	1.572E-02	1.980E-03	1.05E+02	62.865	9.042E-04
Acetaldehyde	5.29E-01	5.19E-04	3.78E-02	2.265E-02	2.854E-03	1.51E+02	90.615	1.303E-03
Acrolein	5.90E-02	5.78E-05	4.21E-03	2.527E-03	3.183E-04	1.68E+01	10.106	1.454E-04
Benzene	2.18E-01	2.14E-04	1.56E-02	9.336E-03	1.176E-03	6.22E+01	37.342	5.371E-04
PAHs [as B(a)P]	1.71E-05	1.68E-08	1.22E-06	7.343E-07	9.253E-08	4.90E-03	0.003	4.225E-08
Ethylbenzene	7.11E-02	6.97E-05	5.07E-03	3.045E-03	3.836E-04	2.03E+01	12.179	1.752E-04
Formaldehyde	4.71E+00	4.62E-03	3.36E-01	2.017E-01	2.541E-02	1.34E+03	806.795	1.160E-02
Naphthalene	2.51E-02	2.46E-05	1.79E-03	1.075E-03	1.354E-04	7.17E+00	4.299	6.184E-05
Propylene	5.38E+00	5.27E-03	3.84E-01	2.304E-01	2.903E-02	1.54E+03	921.562	1.326E-02
Toluene	2.39E-01	2.34E-04	1.71E-02	1.023E-02	1.290E-03	6.82E+01	40.939	5.888E-04
Xylene (Total)	6.46E-01	6.33E-04	4.61E-02	2.766E-02	3.486E-03	1.84E+02	110.656	1.592E-03

Emissions Calculations for a Single NG Engine

Application No.		
Plant No.		
Company	EastShore Energy Center	
Input Data		
IC Engine, MMBtu/hr	72.8	
Hours Of Operation, hr/yr	3900	4000
Higher Heating Value, Btu/cf per AP 42 for natural gas	1020	
Calculated Value		
Fuel Usage MMcf/hr	7.14E-02	
Fuel Usage MMcf/yr	278.35	285.49
Abatement Efficiency	40.00%	
# of Engines	14.00	

PAH(s)	**MEAN lbs/MMCF**	PEF equivalents	**MEAN lbs/MMCF**
Benzo(a)anthracene	5.88E-05	0.1	5.88E-06
Benzo(a)pyrene	2.70E-06	1	2.70E-06
Benzo(b)fluoranthene	4.09E-05	0.1	4.09E-06
Benzo(k)fluoranthene	7.83E-06	0.1	7.83E-07
Chrysene	1.43E-05	0.01	1.43E-07
Dibenz(a,h)anthracene	2.70E-06	1.05	2.84E-06
Indeno(1,2,3-cd)pyrene	7.17E-06	0.1	7.17E-07
Total			**1.71E-05**

CATEF Emission Factors for Natural Gas Fired Industrial Turbines SCC 20200202

Emissions Calculations for a Single NG Engine

Application No.		
Plant No.		
Company	EastShore Energy Center	
Input Data		
IC Engine, MMBtu/hr	72.8	
Hours Of Operation, hr/yr	3900	4000
Higher Heating Value, Btu/cf per AP 42 for natural gas	1020	
Calculated Value		
Fuel Usage MMcf/hr	7.14E-02	
Fuel Usage MMcf/yr	278.35	285.49
Abatement Efficiency	40.00%	
# of Engines	14.00	

PAH(s)	MEAN lbs/MMCF	PEF equivalents	MEAN lbs/MMCF
Benzo(a)anthracene	5.88E-05	0.1	5.88E-06
Benzo(a)pyrene	2.70E-06	1	2.70E-06
Benzo(b)fluoranthene	4.09E-05	0.1	4.09E-06
Benzo(k)fluoranthene	7.83E-06	0.1	7.83E-07
Chrysene	1.43E-05	0.01	1.43E-07
Dibenz(a,h)anthracene	2.70E-06	1.05	2.84E-06
Indeno(1,2,3-cd)pyrene	7.17E-06	0.1	7.17E-07
Total			**1.71E-05**

CATEF Emission Factors for Natural Gas Fired Industrial Turbines SCC 20200202

Potential hours/yr	8760
Operating hours/yr Maximum	4000

Table #1

SUBSTANCE	MEAN lbs/MMCF	lbs/MMBtu	lbm/hr	lbm/hr after Abatement	g/sec 1 hr max	lbm/yr	lbm/yr after abatement	g/sec - Annual
Ammonia	1.39E+01	1.36E-02	9.91E-01	9.908E-01	1.248E-01	3.96E+03	3963.232	5.700E-02
1,3-Butadiene	3.67E-01	3.60E-04	2.62E-02	1.572E-02	1.980E-03	1.05E+02	62.865	9.042E-04
Acetaldehyde	5.29E-01	5.19E-04	3.78E-02	2.265E-02	2.854E-03	1.51E+02	90.615	1.303E-03
Acrolein	5.90E-02	5.78E-05	4.21E-03	2.527E-03	3.183E-04	1.68E+01	10.106	1.454E-04
Benzene	2.18E-01	2.14E-04	1.56E-02	9.336E-03	1.176E-03	6.22E+01	37.342	5.371E-04
PAHs [as B(a)P]	1.71E-05	1.68E-08	1.22E-06	7.343E-07	9.253E-08	4.90E-03	0.003	4.225E-08
Ethylbenzene	7.11E-02	6.97E-05	5.07E-03	3.045E-03	3.836E-04	2.03E+01	12.179	1.752E-04
Formaldehyde	4.71E+00	4.62E-03	3.36E-01	2.017E-01	2.541E-02	1.34E+03	806.795	1.160E-02
Naphthalene	2.51E-02	2.46E-05	1.79E-03	1.075E-03	1.354E-04	7.17E+00	4.299	6.184E-05
Propylene	5.36E+00	5.27E-03	3.84E-01	2.304E-01	2.903E-02	1.54E+03	921.562	1.326E-02
Toluene	2.39E-01	2.34E-04	1.71E-02	1.023E-02	1.290E-03	6.82E+01	40.939	5.888E-04
Xylene (Total)	6.46E-01	6.33E-04	4.61E-02	2.766E-02	3.486E-03	1.84E+02	110.656	1.592E-03

Health Risk Screening Analysis Summary forNatural Gas-fired Engine
Facility = Eastshore Energy Center (Hayward, CA)

- **Plant #18041, Application #15195**
- **ISCST3 Air Dispersion Model Used**
- **Union City 5 yrs of Meteorological Data Used**
- **Hayward Terrain Data Used**
- **Daytime Scalars Used**
- **Urban Land Use**

Health Risk Estimates:

TACs	Maximum Emission Rate (g/sec)		Residential Receptor: Max. Annual Avg Conc.[1] (ug/m³)	Max. Hourly Conc.[2] (ug/m³)	Inhalation Dose[3] (mg/kg-day)	Inhalation Cancer Potency Factor (CPF) (mg/kg-day)[-1]	Chronic REL (ug/m³)	Acute REL (ug/m³)	Residential Receptor: Max. Cancer Risk[4]	Max. Chronic Non-cancer HQ[5]	Max. Acute Non-cancer HQ[6]
	Annual	Hourly									
Ammonia	5.7E-02	1.2E-01	6.9E-02	1.3E+01	2.1E-05	NC	2.00E+02	3.20E+03	NC	3.4E-04	4.0E-03
Benzene	5.4E-04	1.2E-03	6.5E-04	1.2E-01	2.0E-07	1.0E-01	6.0E+01	1.3E+03	2.0E-08	1.1E-05	9.3E-05
1,3-Butadiene	9.0E-04	2.0E-03	1.1E-03	2.0E-01	3.3E-07	6.0E-01	2.0E+01	NA	2.0E-07	5.5E-05	NA
Acetaldehyde	1.3E-03	2.9E-03	1.6E-03	2.9E-01	4.8E-07	1.0E-02	9.0E+00	NA	4.8E-09	1.8E-04	NA
PAHs [as B(a)P]	4.2E-08	9.3E-08	5.1E-08	9.5E-06	1.5E-11	6.0E+01	NA	NA	9.3E-10	NA	NA
Ethylbenzene	1.8E-04	3.8E-04	2.1E-04	4.0E-02	6.4E-08	NC	2.0E+03	NA	NC	1.1E-07	NA
Formaldehyde	1.2E-02	2.5E-02	1.4E-02	2.6E+00	4.2E-06	2.1E-02	3.0E+00	9.4E+01	8.9E-08	4.7E-03	2.8E-02
Naphthalene	6.2E-05	1.4E-04	7.5E-05	1.4E-02	2.3E-08	1.2E-01	9.0E+00	NA	2.7E-09	8.3E-06	NA
Propylene	1.3E-02	2.9E-02	1.6E-02	3.0E+00	4.8E-06	NC	3.0E+03	NA	NC	5.3E-06	NA
Toluene	5.9E-04	1.3E-03	7.1E-04	1.3E-01	2.2E-07	NC	3.0E+02	3.7E+04	NC	2.4E-06	3.6E-06
Xylene (Total)	1.6E-03	3.5E-03	1.9E-03	3.6E-01	5.8E-07	NC	7.0E+02	2.2E+04	NC	2.8E-06	1.6E-05
								TOTAL RISK =	*3.2E-07*	*0.005*	*0.028*

Maximum Annual Average Chi/Q ([ug/m³]/[g/sec]) at Resident = 1.21000

Maximum Hourly Chi/Q ([ug/m³]/[g/sec]) = 103

1 Max. Annual Average Concentration (ug/m³) = Max. Annual Emission Rate (g/sec) * Max. Annual Avg. Chi/Q (ug/m³ per g/sec)

2 Max. Hourly Concentration (ug/m³) = Max. Hourly Emission Rate (g/sec) * Max. Hourly Chi/Q (ug/m³ per g/sec)

3 Inhalation Dose (mg/kg-day) = Ann. Avg. Conc. (ug/m³) * BR (L/kg-day) * UCF (mg-m³)/(ug/L) * $EAF_{Residential}$

4 Max. Cancer Risk = Inhalation Dose (mg/kg-day) * CPF (mg/kg-day)[-1]

5 Max. Chronic Non-cancer Hazard Quotient = Ann. Avg. Conc. (ug/m³) * $EAF_{Residential}$ / Chronic REL (ug/m³)

6 Max. Acute Non-cancer Hazard Quotient = Hourly Conc. (ug/m³) / Acute REL (ug/m³)

TACs	Maximum Emission Rate (g/sec)		Worker Receptor: Max. Annual Avg. Conc.[1] (ug/m³)	Max. Hourly Conc.[2] (ug/m³)	Inhalation Dose[3] (mg/kg-day)	Inhalation Cancer Potency Factor (CPF) (mg/kg-day)[-1]	Chronic REL (ug/m³)	Acute REL (ug/m³)	Worker Receptor: Max. Cancer Risk[4]	Max. Chronic Non-cancer HQ[5]	Max. Acute Non-cancer HQ[6]
	Annual	Hourly									
Ammonia	5.7E-02	1.2E-01	1.86804	3.0E+01	2.3E-04	NC	2.00E+02	3.20E+03	NC	4.6E-03	9.4E-03
Benzene	5.4E-04	1.2E-03	0.01758	2.8E-01	2.2E-06	1.0E-01	6.0E+01	1.3E+03	2.2E-07	1.4E-04	2.2E-04
1,3-Butadiene	9.0E-04	2.0E-03	0.0296	4.6E-01	3.7E-06	6.0E-01	2.0E+01	NA	2.2E-06	7.3E-04	NA
Acetaldehyde	1.3E-03	2.9E-03	0.04266	6.9E-01	5.3E-06	1.0E-02	9.0E+00	NA	5.3E-08	2.3E-03	NA
PAHs [as B(a)P]	4.2E-08	9.3E-08	0.00000	2.2E-05	1.7E-10	6.0E+01	NA	NA	1.0E-08	NA	NA
Ethylbenzene	1.8E-04	3.8E-04	0.00573	9.3E-02	7.2E-07	NC	2.0E+03	NA	NC	1.4E-06	NA
Formaldehyde	1.2E-02	2.5E-02	0.37987	6.1E+00	4.8E-05	2.1E-02	3.0E+00	9.4E+01	1.0E-06	6.2E-02	6.5E-02
Naphthalene	6.2E-05	1.4E-04	0.00202	3.3E-02	2.5E-07	1.2E-01	9.0E+00	NA	3.0E-08	1.1E-04	NA
Propylene	1.3E-02	2.9E-02	0.43391	7.0E+00	5.4E-05	NC	3.0E+03	NA	NC	7.1E-05	NA
Toluene	5.9E-04	1.3E-03	0.01828	3.1E-01	2.4E-06	NC	3.0E+02	3.7E+04	NC	3.1E-05	8.4E-06
Xylene (Total)	1.6E-03	3.5E-03	0.05210	8.4E-01	6.5E-06	NC	7.0E+02	2.2E+04	NC	3.8E-05	3.8E-05
								TOTAL RISK =	*3.54E-06*	*0.085*	*0.065*

Maximum Annual Average Chi/Q ([ug/m³]/[g/sec]) at Worker = 32.73498

Maximum Hourly Chi/Q ([ug/m³]/[g/sec]) = 241.45547

1 Max. Annual Average Exposure Concentration (ug/m³) = Max. Annual Emission Rate (g/sec) * Max. Annual Avg. Chi/Q (ug/m³ per g/sec)

2 Max. Hourly Concentration (ug/m³) = Max. Hourly Emission Rate (g/sec) * Max. Hourly Chi/Q (ug/m³ per g/sec)

3 Inhalation Dose (mg/kg-day) = Ann. Avg. Conc. (ug/m³) * BR (L/kg-day) * UCF (mg-m³)/(ug/L) * EAF_{Worker}

4 Max. Cancer Risk = Inhalation Dose (mg/kg-day) * CPF (mg/kg-day)[-1]

5 Max. Chronic Non-cancer Hazard Quotient = Ann. Avg. Conc. (ug/m³) * EAF_{Worker} / Chronic REL (ug/m³)

6 Max. Acute Non-cancer Hazard Quotient = Hourly Conc. (ug/m³) / Acute REL (ug/m³)

Exposure Adjustment Factors (EAFs) for Sources that Operate Intermittently:

	Daily (hours/day)	Weekly (days/week)	Annually (weeks/year)	Lifetime (years per 70-yr lifetime)	Exposure Adjustment Factors (EAFs)[7]	
					(cancer risk)	(non-cancer hazard quotient)
Resident is Present While Source is Operating	24	7	50	70	1.00	1.00
Worker is Present While Source is Operating	8	5	49	40	0.28	0.49
Student is Present While Source is Operating	10	5	36	9	0.06	0.45
Source is Operating	16	5	50	70		
Fraction of Time Resident is Present While the Source is Operating	1.00	1.00	1.00	1.00		
Fraction of Time Worker is Present While the Source is Operating	0.50	1.00	0.98	0.57		
Fraction of Time Student is Present While the Source is Operating	0.63	1.00	0.72	0.13		

7 Note that the fraction of time that a receptor is present while a source is operating can not exceed one.

Thus, if a receptor is present 10 hours/day, but the source operates only 8 hours/day, the maximum that the receptor can be present while the source is operating is the number of hours the source is operating (e.g., 8 hours)

Exposure Parameters:

Receptor	Breathing Rate (BR)[8] (L/kg-day)	Exposure Time (ET) (hours/day)	Exposure Frequency (EF) (day/year)	Exposure Duration (ED) (years)	Units Conversion Factor (UCF) (mg-m³)/(ug-L)	Averaging Time (AT - 70 years) (days)
Resident	302	24	350	70	1.0E-06	25,550
Worker	447	8	245	40	1.0E-06	25,550
Student	561	10	180	9	1.0E-06	25,550

8 Based on a 24-hour day. Worker breathing rate is 149 L/kg-day (for an 8-hour workday), and 447 L/kg-day (for a 24-hour day)

Health Risk Screening Analysis Summary for Natural Gas-fired Engine
Facility = Eastshore Energy Center (Hayward, CA)
- **Plant #18041, Application #15195**
- **ISCST3 Air Dispersion Model Used**
- **Union City 5 yrs of Meteorological Data Used**
- **Hayward Terrain Data Used**
- **Daytime Scalars Used**
- **Urban Land Use**

Health Risk Estimates:

TACs	Maximum Emission Rate (g/sec)		Residential Receptor			Inhalation Cancer Potency Factor (CPF) (mg/kg-day)$^{-1}$	Chronic REL (ug/m^3)	Acute REL (ug/m^3)	Residential Receptor		
	Annual	Hourly	Max. Annual Avg. Conc.[1] (ug/m^3)	Max. Hourly Conc.[2] (ug/m^3)	Inhalation Dose[3] (mg/kg-day)				Max. Cancer Risk[4]	Max. Chronic Non-cancer HQ[5]	Max. Acute Non-cancer HQ[6]
Ammonia	5.7E-02	1.2E-01	6.9E-02	1.3E+01	2.1E-05	NC	2.00E+02	3.20E+03	NC	3.4E-04	4.0E-03
Benzene	5.4E-04	1.2E-03	6.5E-04	1.2E-01	2.0E-07	1.0E-01	6.0E+01	1.3E+03	2.0E-08	1.1E-05	9.3E-05
Acrolein	1.5E-04	3.2E-04	1.8E-04	3.3E-02	5.3E-08	NC	6.0E-02	1.9E-01	NC	2.9E-03	1.7E-01
1,3-Butadiene	9.0E-04	2.0E-03	1.1E-03	2.0E-01	3.3E-07	6.0E-01	2.0E+01	NA	2.0E-07	5.5E-05	NA
Acetaldehyde	1.3E-03	2.9E-03	1.6E-03	2.9E-01	4.8E-07	1.0E-02	9.0E+00	NA	4.8E-09	1.8E-04	NA
PAHs [as B(a)P]	4.2E-06	9.3E-06	5.1E-06	9.5E-06	1.5E-11	6.0E+01	NA	NA	9.3E-10	NA	NA
Ethylbenzene	1.8E-04	3.8E-04	2.1E-04	4.0E-02	6.4E-08	NC	2.0E+03	NA	NC	1.1E-07	NA
Formaldehyde	1.2E-02	2.5E-02	1.4E-02	2.6E+00	4.2E-06	2.1E-02	3.0E+00	9.4E+01	8.9E-08	4.7E-03	2.8E-02
Naphthalene	6.2E-05	1.4E-04	7.5E-05	1.4E-02	2.3E-08	1.2E-01	9.0E+00	NA	2.7E-09	8.3E-06	NA
Propylene	1.3E-02	2.9E-02	1.6E-02	3.0E+00	4.8E-06	NC	3.0E+03	NA	NC	5.3E-08	NA
Toluene	5.9E-04	1.3E-03	7.1E-04	1.3E-01	2.2E-07	NC	3.0E+02	3.7E+04	NC	2.4E-06	3.6E-06
Xylene (Total)	1.6E-03	3.5E-03	1.9E-03	3.6E-01	5.8E-07	NC	7.0E+02	2.2E+04	NC	2.8E-06	1.6E-05
								TOTAL RISK =	*3.2E-07*	*0.008*	*0.201*

Maximum Annual Average ChiQ ((ug/m^3)/(g/sec)) at Resident = 1.21000

Maximum Hourly ChiQ ((ug/m^3)/(g/sec)) = 103

1. Max. Annual Average Concentration (ug/m^3) = Max. Annual Emission Rate (g/sec) * Max. Annual Avg. ChiQ (ug/m^3 per g/sec)
2. Max. Hourly Concentration (ug/m^3) = Max. Hourly Emission Rate (g/sec) * Max. Hourly ChiQ (ug/m^3 per g/sec)
3. Inhalation Dose (mg/kg-day) = Ann. Avg. Conc. (ug/m^3) * BR (L/kg-day) * UCF (mg-m^3)/(ug/L) * EAF$_{source\ rec}$
4. Max. Cancer Risk = Inhalation Dose (mg/kg-day) * CPF (mg/kg-day)$^{-1}$
5. Max. Chronic Non-cancer Hazard Quotient = Ann. Avg. Conc. (ug/m^3) * EAF$_{source\ rec}$ / Chronic REL (ug/m^3)
6. Max. Acute Non-cancer Hazard Quotient = Hourly Conc. (ug/m^3) / Acute REL (ug/m^3)

TACs	Maximum Emission Rate (g/sec)		Worker Receptor			Inhalation Cancer Potency Factor (CPF) (mg/kg-day)$^{-1}$	Chronic REL (ug/m^3)	Acute REL (ug/m^3)	Worker Receptor		
	Annual	Hourly	Max. Annual Avg. Conc.[1] (ug/m^3)	Max. Hourly Conc.[2] (ug/m^3)	Inhalation Dose[3] (mg/kg-day)				Max. Cancer Risk[4]	Max. Chronic Non-cancer HQ[5]	Max. Acute Non-cancer HQ[6]
Ammonia	5.7E-02	1.2E-01	1.86604	3.0E+01	2.3E-04	NC	2.00E+02	3.20E+03	NC	4.6E-03	9.4E-03
Benzene	5.4E-04	1.2E-03	0.01758	2.8E-01	2.2E-06	1.0E-01	6.0E+01	1.3E+03	2.2E-07	1.4E-04	2.2E-04
Acrolein	1.5E-04	3.2E-04	0.00476	7.7E-02	6.0E-07	NC	6.0E-02	1.9E-01	NC	3.9E-02	4.0E-01
1,3-Butadiene	9.0E-04	2.0E-03	0.0296	4.8E-01	3.7E-06	6.0E-01	2.0E+01	NA	2.2E-06	7.3E-04	NA
Acetaldehyde	1.3E-03	2.9E-03	0.04266	6.9E-01	5.3E-06	1.0E-02	9.0E+00	NA	5.3E-08	2.3E-03	NA
PAHs [as B(a)P]	4.2E-06	9.3E-06	0.00000	2.2E-05	1.7E-10	6.0E+01	NA	NA	1.0E-08	NA	NA
Ethylbenzene	1.8E-04	3.8E-04	0.00573	9.3E-02	7.2E-07	NC	2.0E+03	NA	NC	1.4E-06	NA
Formaldehyde	1.2E-02	2.5E-02	0.37987	6.1E+00	4.8E-05	2.1E-02	3.0E+00	9.4E+01	1.0E-06	6.2E-02	6.5E-02
Naphthalene	6.2E-05	1.4E-04	0.00202	3.3E-02	2.5E-07	1.2E-01	9.0E+00	NA	3.0E-08	1.1E-04	NA
Propylene	1.3E-02	2.9E-02	0.43391	7.0E+00	5.4E-05	NC	3.0E+03	NA	NC	7.1E-05	NA
Toluene	5.9E-04	1.3E-03	0.01928	3.1E-01	2.4E-06	NC	3.0E+02	3.7E+04	NC	3.1E-05	8.4E-06
Xylene (Total)	1.6E-03	3.5E-03	0.05210	8.4E-01	6.5E-06	NC	7.0E+02	2.2E+04	NC	3.6E-05	3.8E-05
								TOTAL RISK =	*3.64E-06*	*0.104*	*0.470*

Maximum Annual Average ChiQ ((ug/m^3)/(g/sec)) at Worker = 32.73498

Maximum Hourly ChiQ ((ug/m^3)/(g/sec)) = 241.45547

1. Max. Annual Average Exposure Concentration (ug/m^3) = Max. Annual Emission Rate (g/sec) * Max. Annual Avg. ChiQ (ug/m^3 per g/sec)
2. Max. Hourly Concentration (ug/m^3) = Max. Hourly Emission Rate (g/sec) * Max. Hourly ChiQ (ug/m^3 per g/sec)
3. Inhalation Dose (mg/kg-day) = Ann. Avg. Conc. (ug/m^3) * BR (L/kg-day) * UCF (mg-m^3)/(ug/L) * EAF$_{source\ rec}$
4. Max. Cancer Risk = Inhalation Dose (mg/kg-day) * CPF (mg/kg-day)$^{-1}$
5. Max. Chronic Non-cancer Hazard Quotient = Ann. Avg. Conc. (ug/m^3) * EAF$_{source\ rec}$ / Chronic REL (ug/m^3)
6. Max. Acute Non-cancer Hazard Quotient = Hourly Conc. (ug/m^3) / Acute REL (ug/m^3)

Exposure Adjustment Factors (EAFs) for Sources that Operate Intermittently:

	Daily (hours/day)	Weekly (days/week)	Annually (weeks/year)	Lifetime (years per 70-yr lifetime)	Exposure Adjustment Factors (EAFs)[7]	
					(cancer risk)	(non-cancer hazard quotient)
Resident is Present While Source is Operating	24	7	50	70		
Worker is Present While Source is Operating	8	5	49	40		
Student is Present While Source is Operating	10	5	36	9		
Source is Operating	16	5	50	70		
Fraction of Time **Resident** is Present While the Source is Operating	1.00	1.00	1.00	1.00	1.00	1.00
Fraction of Time **Worker** is Present While the Source is Operating	0.50	1.00	0.98	0.57	0.28	0.49
Fraction of Time **Student** is Present While the Source is Operating	0.63	1.00	0.72	0.13	0.06	0.45

7 Note that the fraction of time that a receptor is present while a source is operating can not exceed one

Thus, if a receptor is present 10 hours/day, but the source operates only 8 hours/day, the maximum that the receptor can be present while the source is operating is the number of hours the source is operating (e.g., 8 hours).

Exposure Parameters:

Receptor	Breathing Rate (BR)[8] (L/kg-day)	Exposure Time (ET) (hours/day)	Exposure Frequency (EF) (day/year)	Exposure Duration (ED) (years)	Units Conversion Factor (UCF) (mg-m^3)/(ug-L)	Averaging Time (AT - 70 years) (days)
Resident	302	24	350	70	1.0E-06	25,550
Worker	447	8	245	40	1.0E-06	25,550
Student	581	10	180	9	1.0E-06	25,550

8 Based on a 24-hour day. Worker breathing rate is 149 L/kg-day (for an 8-hour workday), and 447 L/kg-day (for a 24-hour day)

Health Risk Screening Analysis Summary for Standby Generator Diesel Engine
Facility =Eastshore Energy Center, (Hayward, CA)

- **Plant #18041; Application #15195**
- **ISC Air Dispersion Model Used**
- **Union City Meteorological Data Used**
- **Hayward Terrain Data Used**
- **Daytime Scalars Used**
- **Urban Land Use** @ pt of Max for Natural Gas

Health Risk Estimates:

Receptor	Max. Annual Emission Rate (lb/yr)	Max. Annual Emission Rate (g/sec)	Max. Annual Avg. Chi/Q (ug/m^3 per g/sec)	Annual Average Exposure Concentration[1] (ug/m^3)	Inhaletion Dose[2] (mg/kg-day)	Diesel PM: Inhalation Cancer Potency Factor (CPF) $(mg/kg\text{-}day)^{-1}$	Diesel PM: Inhalation Reference Exposure Level (REL) (ug/m^3)	***Max. Cancer Risk[3]***	***Max. Non-cancer Hazard Quotient[4]***
Resident	4.5434	6.5E-05	4.8E-01	0.00003	9.5E-09	1.1E+00	5.0E+00	***1.05E-08***	***6.3E-06***
Worker	4.5434	6.5E-05	1.8E+01	0.00115	2.9E-07	1.1E+00	5.0E+00	***3.16E-07***	***2.2E-04***
Student	0	0.0E+00	0	0.0E+00	0.0E+00	1.1E+00	5.0E+00	***0.0E+00***	***0.0E+00***

1. Annual Average Exposure Concentration (ug/m^3) = Max. Annual Emission Rate (g/sec) * Max. Annual Avg. Chi/Q (ug/m^3 per g/sec)
2. Inhalation Dose (mg/kg-day) = Ann. Avg. Exp. Conc. (ug/m^3) * BR (L/kg-day) * UCF ($mg\text{-}m^3$)/(ug/L) * $EAF_{(cancer\ risk)}$
3. Max. Cancer Risk = Inhalation Dose (mg/kg-day) * CPF $(mg/kg\text{-}day)^{-1}$
4. Max. Non-cancer Hazard Quotient = Ann. Avg. Exp. Conc. (ug/m^3) * $EAF_{(non\text{-}cancer)}$ / REL (ug/m^3)

Exposure Adjustment Factors (EAFs) for Sources that Operate Intermittently:

	Daily (hours/day)	Weekly (days/week)	Annually (weeks/year)	Lifetime (years per 70-yr lifetime)	Exposure Adjustment Factors (EAFs)[5] (cancer risk)	Exposure Adjustment Factors (EAFs)[5] (non-cancer hazard quotient)
Resident is Present While Source is Operating	24	7	50	70		
Worker is Present While Source is Operating	8	5	49	40		
Student is Present While Source is Operating	10	5	36	9		
Source is Operating	1	1	50	70		
Fraction of Time **Resident** is Present While the Source is Operating	1.00	1.00	1.00	1.00	1.00	1.00
Fraction of Time **Worker** is Present While the Source is Operating	1.00	1.00	0.98	0.57	0.56	0.98
Fraction of Time **Student** is Present While the Source is Operating	1.00	1.00	0.72	0.13	0.09	0.72

5. Note that the fraction of time that a receptor is present while a source is operating can not exceed one.
Thus, if a receptor is present 10 hours/day, but the source operates only 8 hours/day, the maximum that the receptor can be present while the source is operating is the number of hours the source is operating (e.g., 8 hours).

Exposure Parameters:

Receptor	Breathing Rate (BR)[6] (L/kg-day)	Exposure Time (ET) (hours/day)	Exposure Frequency (EF) (day/year)	Exposure Duration (ED) (years)	Units Conversion Factor (UCF) $(mg\text{-}m^3)/(ug/L)$	Averaging Time (AT - 70 years) (days)
Resident	302	24	350	70	1.0E-06	25,550
Worker	447	8	245	40	1.0E-06	25,550
Student	581	10	180	9	1.0E-06	25,550

6. Based on a 24-hour day. Worker breathing rate is 149 L/kg-day (for an 8-hour workday), and 447 L/kg-dey (for a 24-hour day).

Health Risk Screening Analysis Summary for Standby Generator Diesel Engine
Facility =Eastshore Energy Center, (Hayward, CA)

- **Plant #18041; Application #15195** MAX PT
- **ISC Air Dispersion Model Used**
- **Union City Meteorological Data Used**
- **Hayward Terrain Data Used**
- **Daytime Scalars Used**
- **Urban Land Use**

Health Risk Estimates:

						Diesel PM			
Receptor	Max. Annual Emission Rate		Max. Annual Avg. Chi/Q	Annual Average Exposure Concentration[1]	Inhalation Dose[2]	Inhalation Cancer Potency Factor (CPF)	Inhalation Reference Exposure Level (REL)	***Max. Cancer Risk[3]***	***Max. Non-cancer Hazard Quotient[4]***
	(lb/yr)	(g/sec)	(ug/m^3 per g/sec)	(ug/m^3)	(mg/kg-day)	$(mg/kg\text{-}day)^{-1}$	(ug/m^3)		
Resident	4.5434	6.5E-05	5.2E-01	0.00003	1.0E-08	1.1E+00	5.0E+00	***1.13E-08***	***6.8E-06***
Worker	4.5434	6.5E-05	3.5E+01	0.00229	5.7E-07	1.1E+00	5.0E+00	***6.30E-07***	***4.5E-04***
Student	0	0.0E+00	0	0.0E+00	0.0E+00	1.1E+00	5.0E+00	***0.0E+00***	***0.0E+00***

1. Annual Average Exposure Concentration (ug/m^3) = Max. Annual Emission Rate (g/sec) * Max. Annual Avg. Chi/Q (ug/m^3 per g/sec)
2. Inhalation Dose (mg/kg-day) = Ann. Avg. Exp. Conc. (ug/m^3) * BR (L/kg-day) * UCF ($mg\text{-}m^3/ug/L$) * $EAF_{(cancer\ risk)}$
3. Max. Cancer Risk = Inhalation Dose (mg/kg-day) * CPF $(mg/kg\text{-}day)^{-1}$
4. Max. Non-cancer Hazard Quotient = Ann. Avg. Exp. Conc. (ug/m^3) * $EAF_{(non\text{-}cancer)}$ / REL (ug/m^3)

Exposure Adjustment Factors (EAFs) for Sources that Operate Intermittently:

	Daily (hours/day)	Weekly (days/week)	Annually (weeks/year)	Lifetime (years per 70-yr lifetime)	Exposure Adjustment Factors (EAFs)[5]	
Resident is Present While Source is Operating	24	7	50	70		
Worker is Present While Source is Operating	8	5	49	40		
Student is Present While Source is Operating	10	5	36	9	(cancer risk)	(non-cancer hazard quotient)
Source is Operating	1	1	50	70		
Fraction of Time **Resident** is Present While the Source is Operating	1.00	1.00	1.00	1.00	1.00	1.00
Fraction of Time **Worker** is Present While the Source is Operating	1.00	1.00	0.98	0.57	0.56	0.98
Fraction of Time **Student** is Present While the Source is Operating	1.00	1.00	0.72	0.13	0.09	0.72

5. Nota that the fraction of time that a raceptor is present while a source is operating can not exceed one.

Thus, if a receptor is present 10 hours/day, but the source operates only 8 hours/day, the maximum that the receptor can be present while the source is operating is the number of hours the source is operating (e.g., 8 hours).

Exposure Parameters:

Receptor	Breathing Rate (BR)[6] (L/kg-day)	Exposure Time (ET) (hours/day)	Exposure Frequency (EF) (day/year)	Exposure Duration (ED) (years)	Units Conversion Factor (UCF) $(mg\text{-}m^3)/(ug/L)$	Averaging Time (AT - 70 years) (days)
Resident	302	24	350	70	1.0E-06	25,550
Worker	447	8	245	40	1.0E-06	25,550
Student	581	10	180	9	1.0E-06	25,550

6. Based on a 24-hour day. Worker breathing rate is 149 L/kg-day (for an 8-hour workday), and 447 L/kg-day (for a 24-hour day).

Risk Screening Assessment Dispersion Modeling Checklist

Application No: 15195 Modeler:

GEOGRAPHIC DATA

BEEST run for the following land use (check all that apply): ☑urban ☐rural

Coordinate system used: ☑NAD27 ☐NAD83 ☐relative

Was elevated terrain data used? ☑yes ☐no

If yes, name(s) of USGS DEM quad used:

METEOROLOGICAL DATA

Screening: ☐screen ☐daytime screen

Closest met data set identified in BLOB program: _____ Distance _____

Actual: Name of data set:

Year of data:

Mixing Height (m):

Anemometer height (m):

SOURCE DATA

Venting: ☑rain flap ☐rain cap ☐unobstructed (Check all for which the model was run)

☐horizontal ☑vertical (Check all for which the model was run)

Emiss. scalars: ☐yes ☐no (note - emission scalars can't be used with screening met. data)

Operating hours 1-24 Scalar value 1 (24/# of hours of operation)

RECEPTORS

Are schools within: ☐500 feet? (HRSA report required) ☐1000 feet? (HRSA report required) ☐1/4 mile?

☑no schools within 1000 feet.

Are receptors located within a building cavity region? ☐yes ☑no (does the model output show zero concentrations in the wake of nearby buildings?)

Is yes, was ISCPRIME run to determine cavity region concentration? ☐yes ☐no

If yes, the ISCPRIME max. concentration was... ☐higher ☐lower ...than the max ISC concentration.

COMMENTS:

Health Risk Screening Analysis Summary forNatural Gas-fired Engine
Facility = Eastshore Energy Center (Hayward, CA)

- **Plant #18041, Application #15195**
- **ISCST3 Air Dispersion Model Used**
- **Union City 5 yrs of Meteorological Data Used**
- **Hayward Terrain Data Used**
- **Daytime Scalars Used**
- **Urban Land Use**

Health Risk Estimates:

TACs	Maximum Emission Rate (g/sec)		Residential Receptor						Residential Receptor		
	Annual	Hourly	Max. Annual Avg. Conc.[1] (ug/m^3)	Max. Hourly Conc.[2] (ug/m^3)	Inhalation Dose[3] (mg/kg-day)	Inhalation Cancer Potency Factor (CPF) $(mg/kg\text{-}day)^{-1}$	Chronic REL (ug/m^3)	Acute REL (ug/m^3)	Max. Cancer Risk[4]	Max. Chronic Non-cancer HQ[5]	Max. Acute Non-cancer HQ[6]
Ammonia	5.7E-02	1.2E-01	6.9E-02	1.3E+01	2.1E-05	NC	2.00E+02	3.20E+03	NC	3.4E-04	4.0E-03
Benzene	5.4E-04	1.2E-03	6.5E-04	1.2E-01	2.0E-07	1.0E-01	6.0E+01	1.3E+03	2.0E-08	1.1E-05	9.3E-06
1,3-Butadiene	9.0E-04	2.0E-03	1.1E-03	2.0E-01	3.3E-07	6.0E-01	2.0E+01	NA	2.0E-07	5.5E-05	NA
Acetaldehyde	1.3E-03	2.9E-03	1.6E-03	2.9E-01	4.8E-07	1.0E-02	9.0E+00	NA	4.8E-09	1.6E-04	NA
PAHs [as B(a)P]	4.2E-08	9.3E-08	5.1E-08	9.5E-06	1.5E-11	6.0E+01	NA	NA	9.3E-10	NA	NA
Ethylbenzene	1.8E-04	3.8E-04	2.1E-04	4.0E-02	6.4E-08	NC	2.0E+03	NA	NC	1.1E-07	NA
Formaldehyde	1.2E-02	2.5E-02	1.4E-02	2.6E+00	4.2E-06	2.1E-02	3.0E+00	9.4E+01	8.8E-08	4.7E-03	2.8E-02
Naphthalene	6.2E-05	1.4E-04	7.5E-05	1.4E-02	2.3E-08	1.2E-01	9.0E+00	NA	2.7E-09	8.3E-06	NA
Propylene	1.3E-02	2.9E-02	1.5E-02	3.0E+00	4.8E-06	NC	3.0E+03	NA	NC	5.3E-06	NA
Toluene	5.9E-04	1.3E-03	7.1E-04	1.3E-01	2.2E-07	NC	3.0E+02	3.7E+04	NC	2.4E-06	3.6E-06
Xylene (Total)	1.6E-03	3.5E-03	1.9E-03	3.6E-01	5.8E-07	NC	7.0E+02	2.2E+04	NC	2.8E-06	1.6E-05
								TOTAL RISK =	*3.2E-07*	*0.005*	*0.028*

Maximum Annual Average Ch/Q ([ug/m^3]/[g/sec]) at Resident = 1.21000

Maximum Hourly Ch/Q ([ug/m^3]/[g/sec]) = 103

1 Max. Annual Average Concentration (ug/m^3) = Max. Annual Emission Rate (g/sec) * Max. Annual Avg. Ch/Q (ug/m^3 per g/sec)

2 Max. Hourly Concentration (ug/m^3) = Max. Hourly Emission Rate (g/sec) * Max. Hourly Ch/Q (ug/m^3 per g/sec)

3 Inhalation Dose (mg/kg-day) = Ann. Avg. Conc. (ug/m^3) * BR (L/kg-day) * UCF ($mg\text{-}m^3$/ug/L) * $EAF_{cancer\ risk}$

4 Max. Cancer Risk = Inhalation Dose (mg/kg-day) * CPF $(mg/kg\text{-}day)^{-1}$

5 Max. Chronic Non-cancer Hazard Quotient = Ann. Avg. Conc. (ug/m^3) * $EAF_{non\text{-}cancer\ risk}$ / Chronic REL (ug/m^3)

6 Max. Acute Non-cancer Hazard Quotient = Hourly Conc. (ug/m^3) / Acute REL (ug/m^3)

TACs	Maximum Emission Rate (g/sec)		Worker Receptor						Worker Receptor		
	Annual	Hourly	Max. Annual Avg. Conc.[1] (ug/m^3)	Max. Hourly Conc.[2] (ug/m^3)	Inhalation Dose[3] (mg/kg-day)	Inhalation Cancer Potency Factor (CPF) $(mg/kg\text{-}day)^{-1}$	Chronic REL (ug/m^3)	Acute REL (ug/m^3)	Max. Cancer Risk[4]	Max. Chronic Non-cancer HQ[5]	Max. Acute Non-cancer HQ[6]
Ammonia	5.7E-02	1.2E-01	1.86604	3.0E+01	2.3E-04	NC	2.00E+02	3.20E+03	NC	4.6E-03	9.4E-03
Benzene	5.4E-04	1.2E-03	0.01758	2.8E-01	2.2E-06	1.0E-01	6.0E+01	1.3E+03	2.2E-07	1.4E-04	2.2E-04
1,3-Butadiene	9.0E-04	2.0E-03	0.0296	4.8E-01	3.7E-06	6.0E-01	2.0E+01	NA	2.2E-06	7.3E-04	NA
Acetaldehyde	1.3E-03	2.9E-03	0.04266	6.9E-01	5.3E-06	1.0E-02	9.0E+00	NA	5.3E-08	2.3E-03	NA
PAHs [as B(a)P]	4.2E-08	9.3E-08	0.00000	2.2E-05	1.7E-10	6.0E+01	NA	NA	1.0E-08	NA	NA
Ethylbenzene	1.8E-04	3.8E-04	0.00573	9.3E-02	7.2E-07	NC	2.0E+03	NA	NC	1.4E-06	NA
Formaldehyde	1.2E-02	2.5E-02	0.37987	6.1E+00	4.8E-05	2.1E-02	3.0E+00	9.4E+01	1.0E-06	6.2E-02	6.5E-02
Naphthalene	6.2E-05	1.4E-04	0.00202	3.3E-02	2.5E-07	1.2E-01	9.0E+00	NA	3.0E-08	1.1E-04	NA
Propylene	1.3E-02	2.9E-02	0.43391	7.0E+00	5.4E-05	NC	3.0E+03	NA	NC	7.1E-05	NA
Toluene	5.9E-04	1.3E-03	0.01928	3.1E-01	2.4E-06	NC	3.0E+02	3.7E+04	NC	3.1E-05	8.4E-06
Xylene (Total)	1.6E-03	3.5E-03	0.05210	8.4E-01	6.5E-06	NC	7.0E+02	2.2E+04	NC	3.6E-05	3.8E-05
								TOTAL RISK =	*3.54E-06*	*0.065*	*0.066*

Maximum Annual Average Ch/Q ([ug/m^3]/[g/sec]) at Worker = 32.73496

Maximum Hourly Ch/Q ([ug/m^3]/[g/sec]) = 241.45547

1 Max. Annual Average Exposure Concentration (ug/m^3) = Max. Annual Emission Rate (g/sec) * Max. Annual Avg. Ch/Q (ug/m^3 per g/sec)

2 Max. Hourly Concentration (ug/m^3) = Max. Hourly Emission Rate (g/sec) * Max. Hourly Ch/Q (ug/m^3 per g/sec)

3 Inhalation Dose (mg/kg-day) = Ann. Avg. Conc. (ug/m^3) * BR (L/kg-day) * UCF ($mg\text{-}m^3$/ug/L) * $EAF_{cancer\ risk}$

4 Max. Cancer Risk = Inhalation Dose (mg/kg-day) * CPF $(mg/kg\text{-}day)^{-1}$

5 Max. Chronic Non-cancer Hazard Quotient = Ann. Avg. Conc. (ug/m^3) * $EAF_{non\text{-}cancer\ risk}$ / Chronic REL (ug/m^3)

6 Max. Acute Non-cancer Hazard Quotient = Hourly Conc. (ug/m^3) / Acute REL (ug/m^3)

Exposure Adjustment Factors (EAFs) for Sources that Operate Intermittently:

	Daily (hours/day)	Weekly (days/week)	Annually (weeks/year)	Lifetime (years per 70-yr lifetime)	Exposure Adjustment Factors (EAFs)[7]	
Resident is Present While Source is Operating	24	7	50	70		
Worker is Present While Source is Operating	8	5	49	40		
Student is Present While Source is Operating	10	5	36	9	(cancer risk)	(non-cancer hazard quotient)
Source is Operating	16	5	50	70		
Fraction of Time Resident is Present While the Source is Operating	1.00	1.00	1.00	1.00	1.00	1.00
Fraction of Time Worker is Present While the Source is Operating	0.50	1.00	0.98	0.57	0.28	0.49
Fraction of Time Student is Present While the Source is Operating	0.63	1.00	0.72	0.13	0.06	0.45

7 Note that the fraction of time that a receptor is present while a source is operating can not exceed one.

Thus, if a receptor is present 10 hours/day, but the source operates only 8 hours/day, the maximum that the receptor can be present while the source is operating is the number of hours the source is operating (e.g., 8 hours).

Exposure Parameters:

Receptor	Breathing Rate (BR)[8] (L/kg-day)	Exposure Time (ET) (hours/day)	Exposure Frequency (EF) (day/year)	Exposure Duration (ED) (years)	Units Conversion Factor (UCF) ($mg\text{-}m^3$/ug-L)	Averaging Time (AT - 70 years) (days)
Resident	302	24	350	70	1.0E-06	25,550
Worker	447	8	245	40	1.0E-06	25,550
Student	581	10	180	9	1.0E-06	25,550

8 Based on a 24-hour day. Worker breathing rate is 149 L/kg-day (for an 8-hour workday), and 447 L/kg-day (for a 24-hour day).

```
**NO GAS DRY DEPOSITION Data Provided.
**Model Does NOT Use GRIDDED TERRAIN Data for Depletion Calculations

**Model Uses URBAN Dispersion.

**Model Uses User-Specified Options:
          1. Gradual Plume Rise.
          2. Stack-tip Downwash.
          3. Buoyancy-induced Dispersion.
          4. Calms Processing Routine.
          5. Not Use Missing Data Processing Routine.
          6. User-Specified Wind Profile Exponents.
          7. Default Vertical Potential Temperature Gradients.

**Model Accepts Receptors on ELEV Terrain.

**Model Assumes No FLAGPOLE Receptor Heights.

**Model Calculates  1 Short Term Average(s) of:   1-HR
    and Calculates PERIOD Averages

**This Run Includes:    14 Source(s);     31 Source Group(s); and    2357 Receptor(s)

**The Model Assumes A Pollutant Type of:  NGAS

**Model Set To Continue RUNning After the Setup Testing.

**Output Options Selected:
         Model Outputs Tables of PERIOD Averages by Receptor
         Model Outputs Tables of Highest Short Term Values by Receptor (RECTABLE Keyword)
         Model Outputs External File(s) of High Values for Plotting (PLOTFILE Keyword)

**NOTE:  The Following Flags May Appear Following CONC Values:  c for Calm Hours
                                                                m for Missing Hours
                                                                b for Both Calm and Missing Hours

**Misc. Inputs:  Anem. Hgt. (m) =    20.00 ;    Decay Coef. =    0.000     ;    Rot. Angle =     0.0
                 Emission Units = GRAMS/SEC                                ;  Emission Rate Unit Factor =   0.10000E+07
                 Output Units   = MICROGRAMS/M**3

**Approximate Storage Requirements of Model =     2.5 MB of RAM.

**Input Runstream File:          EECenter(unitless)gradualplumerise_90_NGAS.DTA
**Output Print File:             EECenter(unitless)gradualplumerise_90_NGAS.LST

 *** ISCST3 - VERSION 02035 ***    *** Eastshore Energy LLC                                          ***        01/25/07
                                   ***                                                               ***        16:23:53
**MODELOPTs:                                                                                                  PAGE    2
CONC                   URBAN ELEV               GRDRIS
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*** POINT SOURCE DATA ***

SOURCE ID	NUMBER PART. CATS.	EMISSION RATE (GRAMS/SEC)	X (METERS)	Y (METERS)	BASE ELEV. (METERS)	STACK HEIGHT (METERS)	STACK TEMP. (DEG.K)	STACK EXIT VEL. (M/SEC)	STACK DIAMETER (METERS)	BUILDING EXISTS	EMISSION RATE SCALAR VARY BY
1	0	0.10000E+01	577527.1	4165779.5	6.4	21.34	641.65	23.48	1.21	YES	
2	0	0.10000E+01	577532.4	4165779.5	6.4	21.34	641.65	23.48	1.21	YES	
3	0	0.10000E+01	577537.9	4165779.5	6.6	21.34	641.65	23.48	1.21	YES	
4	0	0.10000E+01	577548.7	4165779.5	6.7	21.34	641.65	23.48	1.21	YES	
5	0	0.10000E+01	577554.1	4165779.5	6.7	21.34	641.65	23.48	1.21	YES	
6	0	0.10000E+01	577559.4	4165779.5	6.7	21.34	641.65	23.48	1.21	YES	
7	0	0.10000E+01	577564.9	4165779.5	6.7	21.34	641.65	23.48	1.21	YES	
14	0	0.10000E+01	577604.6	4165779.5	7.3	21.34	641.65	23.48	1.21	YES	
13	0	0.10000E+01	577609.9	4165779.5	7.3	21.34	641.65	23.48	1.21	YES	
12	0	0.10000E+01	577615.4	4165779.5	7.3	21.34	641.65	23.48	1.21	YES	
11	0	0.10000E+01	577620.8	4165779.5	7.0	21.34	641.65	23.48	1.21	YES	
10	0	0.10000E+01	577631.6	4165779.5	7.0	21.34	641.65	23.48	1.21	YES	
9	0	0.10000E+01	577636.9	4165779.5	7.0	21.34	641.65	23.48	1.21	YES	
8	0	0.10000E+01	577642.4	4165779.5	7.0	21.34	641.65	23.48	1.21	YES	

**MODELOPTs:
CONC URBAN ELEV GRDRIS

*** SOURCE IDs DEFINING SOURCE GROUPS ***

GROUP ID	SOURCE IDs
ALL	1 , 2 , 3 , 4 , 5 , 6 , 7 , 14 , 13 , 12 , 11 , 10 , 9 , 8 ,
NATGAS	1 , 2 , 3 , 4 , 5 , 6 , 7 , 14 , 13 , 12 , 11 , 10 , 9 , 8 ,
S1	1 ,
S2	2 ,

```
S3        3       ,

S4        4       ,

S5        5       ,

S6        6       ,

S7        7       ,

S8        8       ,

S9        9       ,

S10       10      ,

S11       11      ,

S12       12      ,

S13       13      ,

S14       14      ,

SA11      1       , 2       , 3       , 4       , 5       , 6       , 7       , 14      , 13      , 12      , 11      , 10      ,
          9       , 8       ,
```



```
**MODELOPTs:
CONC                    URBAN ELEV              GRDRIS
```

*** SOURCE IDs DEFINING SOURCE GROUPS ***

GROUP ID	SOURCE IDs
1	1 ,
2	2 ,
3	3 ,
4	4 ,
5	5 ,
6	6 ,
7	7 ,
14	14 ,
13	13 ,
12	12 ,
11	11 ,
10	10 ,
9	9 ,
8	8 ,

**MODELOPTs:
CONC URBAN ELEV GRDRIS

*** DIRECTION SPECIFIC BUILDING DIMENSIONS ***

SOURCE ID: 1

IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK
1	9.0,	129.5,	0	2	9.0,	126.6,	0	3	14.9,	90.5,	0	4	14.9,	103.4,	0	5	14.9,	113.8,	0	6	14.9,	120.7,	0
7	14.9,	124.0,	0	8	14.9,	123.5,	0	9	14.9,	119.2,	0	10	9.0,	40.8,	0	11	9.0,	60.0,	0	12	9.0,	79.0,	0
13	9.0,	95.7,	0	14	9.0,	109.4,	0	15	9.0,	119.8,	0	16	9.0,	126.6,	0	17	9.0,	129.6,	0	18	9.0,	128.6,	0
19	9.0,	129.5,	0	20	13.3,	52.8,	0	21	14.9,	90.5,	0	22	13.3,	53.5,	0	23	13.3,	51.4,	0	24	6.7,	27.5,	0
25	6.7,	19.9,	0	26	0.0,	0.0,	0	27	6.7,	38.8,	0	28	9.0,	40.8,	0	29	9.0,	60.0,	0	30	9.0,	79.0,	0
31	9.0,	95.7,	0	32	9.0,	109.4,	0	33	9.0,	119.8,	0	34	9.0,	126.6,	0	35	9.0,	129.6,	0	36	9.0,	128.6,	0

SOURCE ID: 2

IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK
1	9.0,	129.5,	0	2	9.0,	126.6,	0	3	14.9,	90.5,	0	4	14.9,	103.4,	0	5	14.9,	113.8,	0	6	14.9,	120.7,	0
7	14.9,	124.0,	0	8	14.9,	123.5,	0	9	14.9,	119.2,	0	10	9.0,	40.8,	0	11	9.0,	60.0,	0	12	9.0,	79.0,	0
13	9.0,	95.7,	0	14	9.0,	109.4,	0	15	9.0,	119.8,	0	16	9.0,	126.6,	0	17	9.0,	129.6,	0	18	9.0,	128.6,	0
19	13.3,	50.0,	0	20	13.3,	52.8,	0	21	13.3,	54.0,	0	22	13.3,	53.5,	0	23	13.3,	51.4,	0	24	6.7,	27.5,	0
25	6.7,	19.9,	0	26	6.7,	11.6,	0	27	6.7,	38.8,	0	28	9.0,	40.8,	0	29	9.0,	60.0,	0	30	9.0,	79.0,	0
31	9.0,	95.7,	0	32	9.0,	109.4,	0	33	9.0,	119.8,	0	34	9.0,	126.6,	0	35	9.0,	129.6,	0	36	9.0,	128.6,	0

SOURCE ID: 3

IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK
1	9.0,	129.5,	0	2	9.0,	126.6,	0	3	14.9,	90.5,	0	4	14.9,	103.4,	0	5	14.9,	113.8,	0	6	14.9,	120.7,	0
7	14.9,	124.0,	0	8	14.9,	123.5,	0	9	14.9,	119.2,	0	10	9.0,	40.8,	0	11	9.0,	60.0,	0	12	9.0,	79.0,	0
13	9.0,	95.7,	0	14	9.0,	109.4,	0	15	9.0,	119.8,	0	16	9.0,	126.6,	0	17	9.0,	129.6,	0	18	9.0,	128.6,	0
19	13.3,	50.0,	0	20	13.3,	52.8,	0	21	13.3,	54.0,	0	22	13.3,	53.5,	0	23	13.3,	51.4,	0	24	6.7,	27.5,	0
25	6.7,	19.9,	0	26	6.7,	11.6,	0	27	6.7,	38.8,	0	28	9.0,	40.8,	0	29	9.0,	60.0,	0	30	9.0,	79.0,	0
31	9.0,	95.7,	0	32	9.0,	109.4,	0	33	9.0,	119.8,	0	34	9.0,	126.6,	0	35	9.0,	129.6,	0	36	9.0,	128.6,	0

SOURCE ID: 4

IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK
1	9.0,	129.5,	0	2	9.0,	126.6,	0	3	9.0,	119.7,	0	4	9.0,	109.3,	0	5	9.0,	95.5,	0	6	9.0,	78.8,	0
7	6.7,	11.6,	0	8	6.7,	11.6,	0	9	6.7,	38.8,	0	10	9.0,	40.8,	0	11	9.0,	60.0,	0	12	9.0,	79.0,	0
13	9.0,	95.7,	0	14	9.0,	109.4,	0	15	9.0,	119.8,	0	16	9.0,	126.6,	0	17	9.0,	129.6,	0	18	13.3,	47.6,	0
19	13.3,	50.0,	0	20	13.3,	52.8,	0	21	13.3,	54.0,	0	22	13.3,	53.5,	0	23	9.0,	95.5,	0	24	9.0,	78.8,	0
25	6.7,	11.6,	0	26	6.7,	11.6,	0	27	6.7,	38.8,	0	28	9.0,	40.8,	0	29	9.0,	60.0,	0	30	9.0,	79.0,	0
31	9.0,	95.7,	0	32	9.0,	109.4,	0	33	9.0,	119.8,	0	34	9.0,	126.6,	0	35	9.0,	129.6,	0	36	9.0,	128.6,	0

*** DIRECTION SPECIFIC BUILDING DIMENSIONS ***

SOURCE ID: 5

IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK
1	9.0,	129.5,	0	2	9.0,	126.6,	0	3	9.0,	119.7,	0	4	9.0,	109.3,	0	5	9.0,	95.5,	0	6	9.0,	78.8,	0
7	6.7,	11.6,	0	8	6.7,	7.4,	0	9	6.7,	38.8,	0	10	9.0,	40.8,	0	11	9.0,	60.0,	0	12	9.0,	79.0,	0
13	9.0,	95.7,	0	14	9.0,	109.4,	0	15	9.0,	119.8,	0	16	9.0,	126.6,	0	17	13.3,	50.2,	0	18	13.3,	47.6,	0
19	13.3,	50.0,	0	20	13.3,	52.8,	0	21	13.3,	54.0,	0	22	13.3,	53.5,	0	23	9.0,	95.5,	0	24	9.0,	78.8,	0
25	6.7,	11.6,	0	26	6.7,	7.4,	0	27	6.7,	38.8,	0	28	9.0,	40.8,	0	29	9.0,	60.0,	0	30	9.0,	79.0,	0
31	9.0,	95.7,	0	32	9.0,	109.4,	0	33	9.0,	119.8,	0	34	9.0,	126.6,	0	35	9.0,	129.6,	0	36	9.0,	128.6,	0

SOURCE ID: 6

IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK
1	9.0,	129.5,	0	2	9.0,	126.6,	0	3	9.0,	119.7,	0	4	9.0,	109.3,	0	5	9.0,	95.5,	0	6	9.0,	78.8,	0
7	9.0,	59.7,	0	8	6.7,	7.4,	0	9	6.7,	38.8,	0	10	9.0,	40.8,	0	11	9.0,	60.0,	0	12	9.0,	79.0,	0
13	9.0,	95.7,	0	14	9.0,	109.4,	0	15	9.0,	119.8,	0	16	9.0,	126.6,	0	17	13.3,	50.2,	0	18	13.3,	47.6,	0
19	13.3,	50.0,	0	20	13.3,	52.8,	0	21	13.3,	54.0,	0	22	13.3,	53.5,	0	23	9.0,	95.5,	0	24	9.0,	78.8,	0
25	9.0,	59.7,	0	26	6.7,	7.4,	0	27	6.7,	38.8,	0	28	9.0,	40.8,	0	29	9.0,	60.0,	0	30	9.0,	79.0,	0
31	9.0,	95.7,	0	32	9.0,	109.4,	0	33	9.0,	119.8,	0	34	9.0,	126.6,	0	35	9.0,	129.6,	0	36	9.0,	128.6,	0

SOURCE ID: 7

IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK
1	9.0,	129.5,	0	2	9.0,	126.6,	0	3	9.0,	119.7,	0	4	9.0,	109.3,	0	5	9.0,	95.5,	0	6	9.0,	78.8,	0
7	9.0,	59.7,	0	8	6.7,	7.4,	0	9	6.7,	38.8,	0	10	9.0,	40.8,	0	11	9.0,	60.0,	0	12	9.0,	79.0,	0
13	9.0,	95.7,	0	14	9.0,	109.4,	0	15	9.0,	119.8,	0	16	13.3,	54.1,	0	17	13.3,	50.2,	0	18	13.3,	47.6,	0
19	13.3,	50.0,	0	20	13.3,	52.8,	0	21	13.3,	54.0,	0	22	9.0,	109.3,	0	23	9.0,	95.5,	0	24	9.0,	78.8,	0
25	9.0,	59.7,	0	26	6.7,	7.4,	0	27	6.7,	38.8,	0	28	9.0,	40.8,	0	29	9.0,	60.0,	0	30	9.0,	79.0,	0
31	9.0,	95.7,	0	32	9.0,	109.4,	0	33	9.0,	119.8,	0	34	9.0,	126.6,	0	35	9.0,	129.6,	0	36	9.0,	128.6,	0

SOURCE ID: 14

IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK
1	9.0,	129.5,	0	2	9.0,	126.6,	0	3	9.0,	119.7,	0	4	9.0,	109.3,	0	5	9.0,	95.5,	0	6	9.0,	78.8,	0
7	9.0,	59.7,	0	8	9.0,	38.8,	0	9	6.7,	38.8,	0	10	6.7,	12.0,	0	11	9.0,	60.0,	0	12	9.0,	79.0,	0
13	13.3,	55.6,	0	14	13.3,	56.8,	0	15	13.3,	56.3,	0	16	13.3,	54.1,	0	17	13.3,	50.2,	0	18	13.3,	47.6,	0
19	13.6,	106.0,	0	20	13.6,	110.3,	0	21	13.6,	111.2,	0	22	13.6,	108.8,	0	23	13.6,	103.1,	0	24	13.6,	94.2,	0
25	13.6,	82.5,	0	26	9.0,	38.8,	0	27	6.7,	38.8,	0	28	6.7,	12.0,	0	29	9.0,	60.0,	0	30	9.0,	79.0,	0
31	9.0,	95.7,	0	32	9.0,	109.4,	0	33	9.0,	119.8,	0	34	9.0,	126.6,	0	35	9.0,	129.6,	0	36	9.0,	128.6,	0

**MODELOPTs:
CONC URBAN ELEV GRDRIS

*** DIRECTION SPECIFIC BUILDING DIMENSIONS ***

SOURCE ID: 13

IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK
1	9.0,	129.5,	0	2	9.0,	126.6,	0	3	9.0,	119.7,	0	4	9.0,	109.3,	0	5	9.0,	95.5,	0	6	9.0,	78.8,	0
7	13.6,	82.5,	0	8	9.0,	38.8,	0	9	6.7,	38.8,	0	10	6.7,	12.0,	0	11	6.7,	20.3,	0	12	9.0,	79.0,	0
13	13.3,	55.6,	0	14	13.3,	56.8,	0	15	13.3,	56.3,	0	16	13.3,	54.1,	0	17	13.3,	50.2,	0	18	9.0,	128.6,	0
19	13.6,	106.0,	0	20	13.6,	110.3,	0	21	13.6,	111.2,	0	22	13.6,	108.8,	0	23	13.6,	103.1,	0	24	13.6,	94.2,	0
25	13.6,	82.5,	0	26	9.0,	38.8,	0	27	6.7,	38.8,	0	28	6.7,	12.0,	0	29	6.7,	9.2,	0	30	9.0,	79.0,	0
31	9.0,	95.7,	0	32	9.0,	109.4,	0	33	9.0,	119.8,	0	34	9.0,	126.6,	0	35	9.0,	129.6,	0	36	9.0,	128.6,	0

SOURCE ID: 12

IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK
1	9.0,	129.5,	0	2	9.0,	126.6,	0	3	9.0,	119.7,	0	4	9.0,	109.3,	0	5	9.0,	95.5,	0	6	9.0,	78.8,	0
7	13.6,	82.5,	0	8	9.0,	38.8,	0	9	6.7,	38.8,	0	10	6.7,	12.0,	0	11	6.7,	20.3,	0	12	9.0,	79.0,	0
13	13.3,	55.6,	0	14	13.3,	56.8,	0	15	13.3,	56.3,	0	16	13.3,	54.1,	0	17	13.3,	50.2,	0	18	13.6,	98.4,	0
19	13.6,	106.0,	0	20	13.6,	110.3,	0	21	13.6,	111.2,	0	22	13.6,	108.8,	0	23	13.6,	103.1,	0	24	13.6,	94.2,	0
25	13.6,	82.5,	0	26	9.0,	38.8,	0	27	6.7,	38.8,	0	28	6.7,	12.0,	0	29	6.7,	9.2,	0	30	9.0,	79.0,	0
31	9.0,	95.7,	0	32	9.0,	109.4,	0	33	9.0,	119.8,	0	34	9.0,	126.6,	0	35	9.0,	129.6,	0	36	9.0,	128.6,	0

SOURCE ID: 11

IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK
1	9.0,	129.5,	0	2	9.0,	126.6,	0	3	9.0,	119.7,	0	4	9.0,	109.3,	0	5	9.0,	95.5,	0	6	13.6,	94.2,	0
7	13.6,	82.5,	0	8	9.0,	38.8,	0	9	6.7,	38.8,	0	10	6.7,	12.0,	0	11	6.7,	9.2,	0	12	9.0,	79.0,	0
13	13.3,	55.6,	0	14	13.3,	56.8,	0	15	13.3,	56.3,	0	16	13.3,	54.1,	0	17	13.6,	93.4,	0	18	13.6,	98.4,	0
19	13.6,	106.0,	0	20	13.6,	110.3,	0	21	13.6,	111.2,	0	22	13.6,	108.8,	0	23	13.6,	40.8,	0	24	13.6,	37.2,	0
25	13.6,	32.5,	0	26	9.0,	38.8,	0	27	6.7,	38.8,	0	28	6.7,	12.0,	0	29	6.7,	9.2,	0	30	9.0,	79.0,	0
31	9.0,	95.7,	0	32	9.0,	109.4,	0	33	9.0,	119.8,	0	34	9.0,	126.6,	0	35	13.6,	93.4,	0	36	9.0,	128.6,	0

SOURCE ID: 10

IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK
1	9.0,	129.5,	0	2	9.0,	126.6,	0	3	9.0,	119.7,	0	4	9.0,	109.3,	0	5	13.6,	103.1,	0	6	13.6,	94.2,	0
7	13.6,	82.5,	0	8	9.0,	38.8,	0	9	6.7,	38.8,	0	10	6.7,	12.0,	0	11	6.7,	9.2,	0	12	13.3,	52.7,	0
13	13.3,	55.6,	0	14	13.3,	56.8,	0	15	13.3,	56.3,	0	16	13.6,	85.5,	0	17	13.6,	93.4,	0	18	13.6,	98.4,	0
19	13.6,	106.0,	0	20	13.6,	110.3,	0	21	13.6,	111.2,	0	22	13.6,	43.1,	0	23	13.6,	40.8,	0	24	13.6,	37.2,	0
25	13.6,	32.5,	0	26	9.0,	38.8,	0	27	6.7,	38.8,	0	28	6.7,	12.0,	0	29	6.7,	9.2,	0	30	6.7,	11.9,	0
31	9.0,	95.7,	0	32	9.0,	109.4,	0	33	9.0,	119.8,	0	34	13.6,	85.5,	0	35	13.6,	93.4,	0	36	9.0,	128.6,	0

CONC URBAN ELEV GRDRIS

*** DIRECTION SPECIFIC BUILDING DIMENSIONS ***

SOURCE ID: 9

IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK
1	9.0,	129.5,	0	2	9.0,	126.6,	0	3	9.0,	119.7,	0	4	9.0,	109.3,	0	5	13.6,	103.1,	0	6	13.6,	94.2,	0
7	13.6,	82.5,	0	8	9.0,	38.8,	0	9	6.7,	38.8,	0	10	6.7,	12.0,	0	11	6.7,	9.2,	0	12	13.3,	52.7,	0
13	13.3,	55.6,	0	14	13.3,	56.8,	0	15	13.3,	56.3,	0	16	13.6,	85.5,	0	17	13.6,	93.4,	0	18	13.6,	98.4,	0
19	13.6,	106.0,	0	20	13.6,	110.3,	0	21	13.6,	44.2,	0	22	13.6,	43.1,	0	23	13.6,	40.8,	0	24	13.6,	37.2,	0
25	13.6,	32.5,	0	26	9.0,	38.8,	0	27	6.7,	38.8,	0	28	6.7,	12.0,	0	29	6.7,	9.2,	0	30	6.7,	11.9,	0
31	6.7,	14.3,	0	32	9.0,	109.4,	0	33	9.0,	119.8,	0	34	13.6,	85.5,	0	35	13.6,	93.4,	0	36	9.0,	128.6,	0

SOURCE ID: 8

IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK
1	9.0,	129.5,	0	2	9.0,	126.6,	0	3	9.0,	119.7,	0	4	13.6,	108.8,	0	5	13.6,	103.1,	0	6	13.6,	94.2,	0
7	9.0,	59.7,	0	8	9.0,	38.8,	0	9	6.7,	38.8,	0	10	6.7,	12.0,	0	11	6.7,	9.2,	0	12	6.7,	11.9,	0
13	6.7,	14.3,	0	14	6.7,	16.2,	0	15	13.6,	75.0,	0	16	13.6,	85.5,	0	17	13.6,	93.4,	0	18	13.6,	98.4,	0
19	13.6,	106.0,	0	20	13.6,	110.3,	0	21	13.6,	44.2,	0	22	13.6,	43.1,	0	23	13.6,	40.8,	0	24	13.6,	37.2,	0
25	9.0,	59.7,	0	26	9.0,	38.8,	0	27	6.7,	38.8,	0	28	6.7,	12.0,	0	29	6.7,	9.2,	0	30	6.7,	11.9,	0
31	6.7,	14.3,	0	32	6.7,	16.2,	0	33	13.6,	75.0,	0	34	13.6,	85.5,	0	35	13.6,	93.4,	0	36	9.0,	128.6,	0

*** DISCRETE CARTESIAN RECEPTORS ***
(X-COORD, Y-COORD, ZELEV, ZFLAG)
(METERS)

(	577932.8,	4166528.2,	8.6, 0.0);	(	577932.8,	4166499.8,	9.1, 0.0);
(	577936.3,	4166457.2,	9.1, 0.0);	(	577936.3,	4166421.8,	8.8, 0.0);
(	577939.9,	4166389.8,	8.8, 0.0);	(	577939.9,	4166361.5,	8.8, 0.0);
(	577954.1,	4166347.2,	8.8, 0.0);	(	577982.5,	4166347.2,	8.8, 0.0);
(	578003.8,	4166347.2,	8.9, 0.0);	(	578032.2,	4166347.2,	9.1, 0.0);
(	578071.2,	4166347.2,	9.2, 0.0);	(	578096.1,	4166343.8,	9.4, 0.0);
(	577993.1,	4166340.0,	8.8, 0.0);	(	577964.8,	4166340.0,	8.8, 0.0);
(	577943.4,	4166386.2,	8.8, 0.0);	(	577947.0,	4166428.8,	8.8, 0.0);
(	577939.9,	4166478.5,	9.1, 0.0);	(	577939.9,	4166507.0,	9.1, 0.0);
(	577477.6,	4165819.0,	6.3, 0.0);	(	577479.0,	4165819.0,	6.4, 0.0);
(	577488.7,	4165818.8,	6.4, 0.0);	(	577498.4,	4165818.5,	6.4, 0.0);
(	577508.1,	4165818.0,	6.4, 0.0);	(	577517.8,	4165817.8,	6.4, 0.0);
(	577527.5,	4165817.5,	6.6, 0.0);	(	577537.1,	4165817.0,	6.7, 0.0);
(	577546.8,	4165816.8,	6.7, 0.0);	(	577556.5,	4165816.5,	6.7, 0.0);

(	577566.2,	4165816.0,	6.7,	0.0);	(577575.9,	4165815.8,	6.9, 0.0);
(	577585.6,	4165815.5,	7.0,	0.0);	(577595.3,	4165815.0,	7.0, 0.0);
(	577605.0,	4165814.8,	7.0,	0.0);	(577614.7,	4165814.5,	7.2, 0.0);
(	577624.4,	4165814.2,	7.3,	0.0);	(577634.0,	4165814.0,	7.3, 0.0);
(	577643.7,	4165813.5,	7.3,	0.0);	(577653.4,	4165813.2,	7.3, 0.0);
(	577663.1,	4165813.0,	7.4,	0.0);	(577672.8,	4165812.5,	7.6, 0.0);
(	577682.5,	4165812.2,	7.6,	0.0);	(577691.6,	4165809.0,	7.6, 0.0);
(	577700.7,	4165805.5,	7.6,	0.0);	(577709.7,	4165802.2,	7.9, 0.0);
(	577718.8,	4165799.0,	7.9,	0.0);	(577726.2,	4165793.5,	7.9, 0.0);
(	577733.6,	4165788.2,	7.9,	0.0);	(577741.0,	4165782.8,	7.9, 0.0);
(	577748.4,	4165777.5,	7.9,	0.0);	(577755.8,	4165772.0,	8.1, 0.0);
(	577755.9,	4165762.5,	8.2,	0.0);	(577756.0,	4165753.2,	8.2, 0.0);
(	577756.2,	4165743.8,	8.2,	0.0);	(577756.3,	4165734.5,	8.2, 0.0);
(	577756.4,	4165725.0,	8.2,	0.0);	(577756.4,	4165718.2,	8.2, 0.0);
(	577746.8,	4165718.2,	8.2,	0.0);	(577737.1,	4165718.5,	8.1, 0.0);
(	577727.5,	4165718.5,	7.9,	0.0);	(577717.8,	4165718.5,	7.9, 0.0);
(	577708.1,	4165718.8,	7.9,	0.0);	(577698.5,	4165718.8,	7.7, 0.0);
(	577688.8,	4165719.0,	7.6,	0.0);	(577679.2,	4165719.0,	7.6, 0.0);
(	577669.5,	4165719.0,	7.6,	0.0);	(577659.8,	4165719.2,	7.3, 0.0);
(	577650.2,	4165719.2,	7.3,	0.0);	(577640.5,	4165719.5,	7.3, 0.0);
(	577630.9,	4165719.5,	7.3,	0.0);	(577621.2,	4165719.5,	7.0, 0.0);
(	577611.5,	4165719.8,	7.0,	0.0);	(577601.9,	4165719.8,	7.0, 0.0);
(	577592.2,	4165720.0,	7.0,	0.0);	(577582.6,	4165720.0,	6.8, 0.0);
(	577572.9,	4165720.0,	6.7,	0.0);	(577563.2,	4165720.0,	6.7, 0.0);
(	577553.6,	4165720.2,	6.5,	0.0);	(577543.9,	4165720.2,	6.4, 0.0);
(	577534.3,	4165720.5,	6.4,	0.0);	(577524.6,	4165720.5,	6.2, 0.0);
(	577514.9,	4165720.5,	6.1,	0.0);	(577505.3,	4165720.8,	6.1, 0.0);
(	577495.6,	4165720.8,	6.1,	0.0);	(577486.0,	4165721.0,	6.1, 0.0);
(	577476.3,	4165721.0,	6.0,	0.0);	(577476.4,	4165730.8,	6.1, 0.0);
(	577476.6,	4165740.5,	6.1,	0.0);	(577476.7,	4165750.5,	6.1, 0.0);
(	577476.8,	4165760.2,	6.1,	0.0);	(577477.0,	4165770.0,	6.1, 0.0);

**MODELOPTs:
CONC URBAN ELEV GRDRIS

*** DISCRETE CARTESIAN RECEPTORS ***
(X-COORD, Y-COORD, ZELEV, ZFLAG)
(METERS)

(	577477.1,	4165779.8,	6.1,	0.0);	(577477.2,	4165789.5,	6.1, 0.0);
(	577477.4,	4165799.5,	6.1,	0.0);	(577477.5,	4165809.2,	6.3, 0.0);
(	577320.0,	4165560.0,	5.2,	0.0);	(577330.0,	4165560.0,	5.2, 0.0);
(	577340.0,	4165560.0,	5.2,	0.0);	(577350.0,	4165560.0,	5.2, 0.0);
(	577360.0,	4165560.0,	5.5,	0.0);	(577370.0,	4165560.0,	5.5, 0.0);
(	577380.0,	4165560.0,	5.5,	0.0);	(577390.0,	4165560.0,	5.5, 0.0);
(	577400.0,	4165560.0,	5.5,	0.0);	(577410.0,	4165560.0,	5.5, 0.0);
(	577420.0,	4165560.0,	5.5,	0.0);	(577430.0,	4165560.0,	5.8, 0.0);
(	577440.0,	4165560.0,	5.8,	0.0);	(577450.0,	4165560.0,	5.8, 0.0);

(577460.0,	4165560.0,	5.8,	0.0);	(577470.0,	4165560.0,	5.8,	0.0);
(577480.0,	4165560.0,	5.8,	0.0);	(577490.0,	4165560.0,	6.1,	0.0);
(577500.0,	4165560.0,	6.1,	0.0);	(577510.0,	4165560.0,	6.1,	0.0);
(577520.0,	4165560.0,	6.1,	0.0);	(577530.0,	4165560.0,	6.4,	0.0);
(577540.0,	4165560.0,	6.4,	0.0);	(577550.0,	4165560.0,	6.4,	0.0);
(577560.0,	4165560.0,	6.7,	0.0);	(577570.0,	4165560.0,	6.7,	0.0);
(577580.0,	4165560.0,	6.7,	0.0);	(577590.0,	4165560.0,	7.0,	0.0);
(577600.0,	4165560.0,	7.0,	0.0);	(577610.0,	4165560.0,	7.3,	0.0);
(577620.0,	4165560.0,	7.3,	0.0);	(577630.0,	4165560.0,	7.6,	0.0);
(577640.0,	4165560.0,	7.6,	0.0);	(577650.0,	4165560.0,	7.6,	0.0);
(577660.0,	4165560.0,	7.9,	0.0);	(577670.0,	4165560.0,	7.9,	0.0);
(577680.0,	4165560.0,	8.2,	0.0);	(577690.0,	4165560.0,	8.5,	0.0);
(577700.0,	4165560.0,	8.5,	0.0);	(577710.0,	4165560.0,	8.8,	0.0);
(577720.0,	4165560.0,	9.1,	0.0);	(577730.0,	4165560.0,	9.1,	0.0);
(577740.0,	4165560.0,	9.4,	0.0);	(577750.0,	4165560.0,	9.4,	0.0);
(577760.0,	4165560.0,	9.4,	0.0);	(577770.0,	4165560.0,	9.4,	0.0);
(577780.0,	4165560.0,	9.4,	0.0);	(577790.0,	4165560.0,	9.1,	0.0);
(577800.0,	4165560.0,	9.1,	0.0);	(577810.0,	4165560.0,	9.1,	0.0);
(577820.0,	4165560.0,	9.1,	0.0);	(577830.0,	4165560.0,	9.1,	0.0);
(577840.0,	4165560.0,	9.1,	0.0);	(577850.0,	4165560.0,	8.8,	0.0);
(577860.0,	4165560.0,	8.8,	0.0);	(577870.0,	4165560.0,	8.8,	0.0);
(577880.0,	4165560.0,	8.8,	0.0);	(577890.0,	4165560.0,	8.8,	0.0);
(577900.0,	4165560.0,	8.8,	0.0);	(577910.0,	4165560.0,	8.8,	0.0);
(577320.0,	4165570.0,	5.2,	0.0);	(577330.0,	4165570.0,	5.2,	0.0);
(577340.0,	4165570.0,	5.2,	0.0);	(577350.0,	4165570.0,	5.2,	0.0);
(577360.0,	4165570.0,	5.5,	0.0);	(577370.0,	4165570.0,	5.5,	0.0);
(577380.0,	4165570.0,	5.5,	0.0);	(577390.0,	4165570.0,	5.5,	0.0);
(577400.0,	4165570.0,	5.5,	0.0);	(577410.0,	4165570.0,	5.5,	0.0);
(577420.0,	4165570.0,	5.5,	0.0);	(577430.0,	4165570.0,	5.8,	0.0);
(577440.0,	4165570.0,	5.8,	0.0);	(577450.0,	4165570.0,	5.8,	0.0);
(577460.0,	4165570.0,	5.8,	0.0);	(577470.0,	4165570.0,	5.8,	0.0);
(577480.0,	4165570.0,	5.8,	0.0);	(577490.0,	4165570.0,	6.1,	0.0);
(577500.0,	4165570.0,	6.1,	0.0);	(577510.0,	4165570.0,	6.1,	0.0);
(577520.0,	4165570.0,	6.1,	0.0);	(577530.0,	4165570.0,	6.4,	0.0);
(577540.0,	4165570.0,	6.4,	0.0);	(577550.0,	4165570.0,	6.4,	0.0);
(577560.0,	4165570.0,	6.7,	0.0);	(577570.0,	4165570.0,	6.7,	0.0);

**MODELOPTs:
CONC URBAN ELEV GRDRIS

* SOURCE-RECEPTOR COMBINATIONS FOR WHICH CALCULATIONS MAY NOT BE PERFORMED *
LESS THAN 1.0 METER OR 3*ZLB IN DISTANCE, OR WITHIN OPEN PIT SOURCE

SOURCE ID	- - RECEPTOR LOCATION - - XR (METERS)	YR (METERS)	DISTANCE (METERS)

1	577546.8	4165816.8	42.16
2	577556.5	4165816.5	44.14
3	577556.5	4165816.5	41.42
11	577614.7	4165814.5	35.52
10	577624.4	4165814.2	35.49
9	577624.4	4165814.2	36.95
8	577624.4	4165814.2	39.14
8	577634.0	4165814.0	35.50

*** METEOROLOGICAL DAYS SELECTED FOR PROCESSING ***
(1=YES; 0=NO)

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1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1
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NOTE: METEOROLOGICAL DATA ACTUALLY PROCESSED WILL ALSO DEPEND ON WHAT IS INCLUDED IN THE DATA FILE.

*** UPPER BOUND OF FIRST THROUGH FIFTH WIND SPEED CATEGORIES ***
(METERS/SEC)

1.54, 3.09, 5.14, 8.23, 10.80,

*** WIND PROFILE EXPONENTS ***

STABILITY	WIND SPEED CATEGORY					
CATEGORY	1	2	3	4	5	6
A	.70000E-01	.70000E-01	.70000E-01	.70000E-01	.70000E-01	.70000E-01
B	.70000E-01	.70000E-01	.70000E-01	.70000E-01	.70000E-01	.70000E-01
C	.10000E+00	.10000E+00	.10000E+00	.10000E+00	.10000E+00	.10000E+00
D	.15000E+00	.15000E+00	.15000E+00	.15000E+00	.15000E+00	.15000E+00
E	.35000E+00	.35000E+00	.35000E+00	.35000E+00	.35000E+00	.35000E+00
F	.55000E+00	.55000E+00	.55000E+00	.55000E+00	.55000E+00	.55000E+00

90 01 01 21	112.0	2.50	281.9	5	600.0	600.0	0.0000	0.0	0.0000	0	0.00	
90 01 01 22	131.0	1.83	281.0	4	600.0	600.0	0.0000	0.0	0.0000	0	0.00	
90 01 01 23	151.0	2.46	280.8	5	600.0	600.0	0.0000	0.0	0.0000	0	0.00	
90 01 01 24	227.0	1.74	280.0	5	600.0	600.0	0.0000	0.0	0.0000	0	0.00	

*** NOTES: STABILITY CLASS 1=A, 2=B, 3=C, 4=D, 5=E AND 6=F.
FLOW VECTOR IS DIRECTION TOWARD WHICH WIND IS BLOWING.

**MODELOPTs:
CONC URBAN ELEV GRDRIS

*** THE PERIOD (43824 HRS) AVERAGE CONCENTRATION VALUES FOR SOURCE GROUP: ALL ***
INCLUDING SOURCE(S): 1 , 2 , 3 , 4 , 5 , 6 , 7 ,
14 , 13 , 12 , 11 , 10 , 9 , 8 ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF NGAS IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC	
577932.75	4166528.25	0.94439	577932.75	4166499.75	0.95934	
577936.31	4166457.25	0.96764	577936.31	4166421.75	0.96896	
577939.88	4166389.75	0.98131	577939.88	4166361.50	0.99282	
577954.06	4166347.25	1.01517	577982.50	4166347.25	1.04895	
578003.81	4166347.25	1.07831	578032.19	4166347.25	1.11979	
578071.25	4166347.25	1.17072	578096.12	4166343.75	1.20852	RES
577993.12	4166340.00	1.06857	577964.75	4166340.00	1.03255	
577943.44	4166386.25	0.98542	577947.00	4166428.75	0.97283	
577939.88	4166478.50	0.96446	577939.88	4166507.00	0.95932	
577477.62	4165819.00	0.27644	577479.00	4165819.00	0.27909	
577488.69	4165818.75	0.26830	577498.38	4165818.50	0.25398	
577508.12	4165818.00	0.23165	577517.81	4165817.75	0.20877	
577527.50	4165817.50	0.19198	577537.12	4165817.00	0.16919	
577546.81	4165816.75	0.14840	577556.50	4165816.50	0.29266	
577566.19	4165816.00	0.74879	577575.88	4165815.75	1.16734	
577585.62	4165815.50	1.62954	577595.31	4165815.00	2.10915	
577605.00	4165814.75	2.61001	577614.69	4165814.50	3.20734	
577624.38	4165814.25	3.72513	577634.00	4165814.00	4.24979	
577643.69	4165813.50	4.81190	577653.38	4165813.25	5.34709	
577663.12	4165813.00	5.95221	577672.81	4165812.50	6.67574	
577682.50	4165812.25	7.27685	577691.62	4165809.00	8.41763	
577700.69	4165805.50	9.74519	577709.69	4165802.25	11.40602	
577718.81	4165799.00	12.95955	577726.19	4165793.50	15.14369	
577733.62	4165788.25	17.33235	577741.00	4165782.75	19.55715	
577748.38	4165777.50	21.53445	577755.81	4165772.00	23.62697	
577755.88	4165762.50	26.83762	577756.00	4165753.25	29.40611	

577756.19	4165743.75	31.35772		577756.31	4165734.50	32.45525
577756.38	4165725.00	32.73498	IND	577756.38	4165718.25	32.45528
577746.81	4165718.25	32.54340		577737.12	4165718.50	32.15517
577727.50	4165718.50	31.16064		577717.81	4165718.50	30.11556
577708.12	4165718.75	28.68698		577698.50	4165718.75	26.47328
577688.81	4165719.00	24.23501		577679.19	4165719.00	22.05082
577669.50	4165719.00	19.88355		577659.81	4165719.25	17.40756
577650.19	4165719.25	15.47644		577640.50	4165719.50	13.57661
577630.88	4165719.50	11.56915		577621.19	4165719.50	9.10724
577611.50	4165719.75	6.96565		577601.88	4165719.75	4.93029
577592.19	4165720.00	3.19749		577582.62	4165720.00	1.83614
577572.88	4165720.00	0.97824		577563.19	4165720.00	0.53227
577553.62	4165720.25	0.32236		577543.88	4165720.25	0.24714
577534.31	4165720.50	0.22043		577524.62	4165720.50	0.20313

**MODELOPTs:
CONC URBAN ELEV GRDRIS

*** THE 1ST HIGHEST 1-HR AVERAGE CONCENTRATION VALUES FOR SOURCE GROUP: ALL ***
INCLUDING SOURCE(S): 1 , 2 , 3 , 4 , 5 , 6 , 7 ,
14 , 13 , 12 , 11 , 10 , 9 , 8 ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF NGAS IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	(YYMMDDHH)	X-COORD (M)	Y-COORD (M)	CONC	(YYMMDDHH)
577932.75	4166528.25	102.68767	(93122324)	577932.75	4166499.75	100.72300	(90012424)
577936.31	4166457.25	94.46078	(91010908)	577936.31	4166421.75	88.01776	(93030807)
577939.88	4166389.75	84.01555	(93011601)	577939.88	4166361.50	80.09186	(93011601)
577954.06	4166347.25	79.17673	(94120522)	577982.50	4166347.25	82.79347	(92030401)
578003.81	4166347.25	85.48978	(92012322)	578032.19	4166347.25	89.67801	(90031020)
578071.25	4166347.25	95.24367	(90010502)	578096.12	4166343.75	98.76987	(91010524)
577993.12	4166340.00	83.37952	(92030401)	577964.75	4166340.00	79.00276	(93040624)
577943.44	4166386.25	84.12881	(93011601)	577947.00	4166428.75	90.01869	(93030807)
577939.88	4166478.50	98.20449	(91010908)	577939.88	4166507.00	102.31668	(90012424)
577477.62	4165819.00	117.86664	(93112813)	577479.00	4165819.00	117.31935	(93112813)
577488.69	4165818.75	107.04486	(93022617)	577498.38	4165818.50	96.68312	(93022617)
577508.12	4165818.00	86.65147	(93112813)	577517.81	4165817.75	79.67763	(93112813)
577527.50	4165817.50	74.52088	(93112813)	577537.12	4165817.00	71.28780	(92032012)
577546.81	4165816.75	66.82955	(92032012)	577556.50	4165816.50	57.39623	(92032012)
577566.19	4165816.00	164.20331	(92062910)	577575.88	4165815.75	189.72913	(90040717)
577585.62	4165815.50	200.53798	(93051913)	577595.31	4165815.00	199.92354	(91092513)
577605.00	4165814.75	198.37993	(93011015)	577614.69	4165814.50	199.40755	(91042518)
577624.38	4165814.25	201.40446	(94042510)	577634.00	4165814.00	200.94949	(94042513)
577643.69	4165813.50	197.31142	(91102213)	577653.38	4165813.25	192.95833	(92062817)

577663.12	4165813.00	191.62750	(92062817)		577672.81	4165812.50	195.79611	(92062817)
577682.50	4165812.25	201.15787	(92062817)		577691.62	4165809.00	212.07544	(94042516)
577700.69	4165805.50	222.59419	(94042516)		577709.69	4165802.25	234.38380	(90051411)
577718.81	4165799.00	238.00526	(90060411)		577726.19	4165793.50	241.03094	(93061011)
577733.62	4165788.25	241.45547	(90061314)	IND	577741.00	4165782.75	237.81494	(93040816)
577748.38	4165777.50	231.48122	(93071517)		577755.81	4165772.00	227.03488	(92062815)
577755.88	4165762.50	224.72575	(90041114)		577756.00	4165753.25	209.87608	(90041114)
577756.19	4165743.75	202.71753	(90081815)		577756.31	4165734.50	198.05521	(90083017)
577756.38	4165725.00	193.46408	(90050214)		577756.38	4165718.25	189.58389	(90092015)
577746.81	4165718.25	193.71527	(93081617)		577737.12	4165718.50	195.70416	(92072013)
577727.50	4165718.50	194.84459	(93062315)		577717.81	4165718.50	192.26039	(93062315)
577708.12	4165718.75	187.11392	(93042016)		577698.50	4165718.75	175.31422	(93042016)
577688.81	4165719.00	174.85107	(92032216)		577679.19	4165719.00	170.07977	(92032216)
577669.50	4165719.00	159.48694	(92032216)		577659.81	4165719.25	143.37132	(92032216)
577650.19	4165719.25	132.12288	(92032216)		577640.50	4165719.50	124.04937	(92032216)
577630.88	4165719.50	119.72742	(92032216)		577621.19	4165719.50	114.20641	(92032216)
577611.50	4165719.75	107.53555	(92032216)		577601.88	4165719.75	93.96880	(92032216)
577592.19	4165720.00	75.07181	(93110116)		577582.62	4165720.00	65.22369	(93110116)
577572.88	4165720.00	61.29892	(92020312)		577563.19	4165720.00	67.91652	(94031212)
577553.62	4165720.25	80.37663	(94031212)		577543.88	4165720.25	89.30459	(94031212)
577534.31	4165720.50	95.94508	(94031212)		577524.62	4165720.50	101.36022	(94031212)

**MODELOPTs:
CONC URBAN ELEV GRDRIS

*** THE 1ST HIGHEST 1-HR AVERAGE CONCENTRATION VALUES FOR SOURCE GROUP: NATGAS ***
INCLUDING SOURCE(S): 1 , 2 , 3 , 4 , 5 , 6 , 7 ,
14 , 13 , 12 , 11 , 10 , 9 , 8 ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF NGAS IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	(YYMMDDHH)		X-COORD (M)	Y-COORD (M)	CONC	(YYMMDDHH)
577932.75	4166528.25	102.68767	(93122324)	RES	577932.75	4166499.75	100.72300	(90012424)
577936.31	4166457.25	94.46078	(91010908)		577936.31	4166421.75	88.01776	(93030807)
577939.88	4166389.75	84.01555	(93011601)		577939.88	4166361.50	80.09186	(93011601)
577954.06	4166347.25	79.17673	(94120522)		577982.50	4166347.25	82.79347	(92030401)
578003.81	4166347.25	85.48978	(92012322)		578032.19	4166347.25	89.67801	(90031020)
578071.25	4166347.25	95.24367	(90010502)		578096.12	4166343.75	98.76987	(91010524)
577993.12	4166340.00	83.37952	(92030401)		577964.75	4166340.00	79.00276	(93040624)
577943.44	4166386.25	84.12881	(93011601)		577947.00	4166428.75	90.01869	(93030807)
577939.88	4166478.50	98.20449	(91010908)		577939.88	4166507.00	102.31668	(90012424)
577477.62	4165819.00	117.86664	(93112813)		577479.00	4165819.00	117.31935	(93112813)
577488.69	4165818.75	107.04486	(93022617)		577498.38	4165818.50	96.68312	(93022617)
577508.12	4165818.00	86.65147	(93112813)		577517.81	4165817.75	79.67763	(93112813)
577527.50	4165817.50	74.52088	(93112813)		577537.12	4165817.00	71.28780	(92032012)
577546.81	4165816.75	66.82955	(92032012)		577556.50	4165816.50	57.39623	(92032012)

577566.19	4165816.00	164.20331	(92062910)	577575.88	4165815.75	189.72913	(90040717)
577585.62	4165815.50	200.53798	(93051913)	577595.31	4165815.00	199.92354	(91092513)
577605.00	4165814.75	198.37993	(93011015)	577614.69	4165814.50	199.40755	(91042518)
577624.38	4165814.25	201.40446	(94042510)	577634.00	4165814.00	200.94949	(94042513)
577643.69	4165813.50	197.31142	(91102213)	577653.38	4165813.25	192.95833	(92062817)
577663.12	4165813.00	191.62750	(92062817)	577672.81	4165812.50	195.79611	(92062817)
577682.50	4165812.25	201.15787	(92062817)	577691.62	4165809.00	212.07544	(94042516)
577700.69	4165805.50	222.59419	(94042516)	577709.69	4165802.25	234.38380	(90051411)
577718.81	4165799.00	238.00526	(90060411)	577726.19	4165793.50	241.03094	(93061011)
577733.62	4165788.25	241.45547	(90061314)	577741.00	4165782.75	237.81494	(93040816)
577748.38	4165777.50	231.48122	(93071517)	577755.81	4165772.00	227.03488	(92062815)
577755.88	4165762.50	224.72575	(90041114)	577756.00	4165753.25	209.87608	(90041114)
577756.19	4165743.75	202.71753	(90081815)	577756.31	4165734.50	198.05521	(90083017)
577756.38	4165725.00	193.46408	(90050214)	577756.38	4165718.25	189.58389	(90092015)
577746.81	4165718.25	193.71527	(93081617)	577737.12	4165718.50	195.70416	(92072013)
577727.50	4165718.50	194.84459	(93062315)	577717.81	4165718.50	192.26039	(93062315)
577708.12	4165718.75	187.11392	(93042016)	577698.50	4165718.75	175.31422	(93042016)
577688.81	4165719.00	174.85107	(92032216)	577679.19	4165719.00	170.07977	(92032216)
577669.50	4165719.00	159.48694	(92032216)	577659.81	4165719.25	143.37132	(92032216)
577650.19	4165719.25	132.12288	(92032216)	577640.50	4165719.50	124.04937	(92032216)
577630.88	4165719.50	119.72742	(92032216)	577621.19	4165719.50	114.20641	(92032216)
577611.50	4165719.75	107.53555	(92032216)	577601.88	4165719.75	93.96880	(92032216)
577592.19	4165720.00	75.07181	(93110116)	577582.62	4165720.00	65.22369	(93110116)
577572.88	4165720.00	61.29892	(92020312)	577563.19	4165720.00	67.91652	(94031212)
577553.62	4165720.25	80.37663	(94031212)	577543.88	4165720.25	89.30459	(94031212)
577534.31	4165720.50	95.94508	(94031212)	577524.62	4165720.50	101.36022	(94031212)

**MODELOPTs:
CONC URBAN ELEV GRDRIS

*** THE SUMMARY OF MAXIMUM PERIOD (43824 HRS) RESULTS ***

** CONC OF NGAS IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZFLAG)	OF TYPE	NETWORK GRID-ID
ALL	1ST HIGHEST VALUE IS	32.73498	AT (577756.38, 4165725.00, 8.20, 0.00)	DC	NA
	2ND HIGHEST VALUE IS	32.54340	AT (577746.81, 4165718.25, 8.20, 0.00)	DC	NA
	3RD HIGHEST VALUE IS	32.49900	AT (577760.00, 4165730.00, 8.20, 0.00)	DC	NA
	4TH HIGHEST VALUE IS	32.45528	AT (577756.38, 4165718.25, 8.20, 0.00)	DC	NA
	5TH HIGHEST VALUE IS	32.45525	AT (577756.31, 4165734.50, 8.20, 0.00)	DC	NA
	6TH HIGHEST VALUE IS	32.44508	AT (577760.00, 4165720.00, 8.20, 0.00)	DC	NA
	7TH HIGHEST VALUE IS	32.15517	AT (577737.12, 4165718.50, 8.10, 0.00)	DC	NA
	8TH HIGHEST VALUE IS	31.96341	AT (577770.00, 4165720.00, 8.20, 0.00)	DC	NA
	9TH HIGHEST VALUE IS	31.83233	AT (577770.00, 4165730.00, 8.20, 0.00)	DC	NA
	10TH HIGHEST VALUE IS	31.71522	AT (577780.00, 4165720.00, 8.50, 0.00)	DC	NA

NATGAS	1ST HIGHEST VALUE IS	32.73498	AT (	577756.38,	4165725.00,	8.20,	0.00)	DC	NA
	2ND HIGHEST VALUE IS	32.54340	AT (	577746.81,	4165718.25,	8.20,	0.00)	DC	NA
	3RD HIGHEST VALUE IS	32.49900	AT (	577760.00,	4165730.00,	8.20,	0.00)	DC	NA
	4TH HIGHEST VALUE IS	32.45528	AT (	577756.38,	4165718.25,	8.20,	0.00)	DC	NA
	5TH HIGHEST VALUE IS	32.45525	AT (	577756.31,	4165734.50,	8.20,	0.00)	DC	NA
	6TH HIGHEST VALUE IS	32.44508	AT (	577760.00,	4165720.00,	8.20,	0.00)	DC	NA
	7TH HIGHEST VALUE IS	32.15517	AT (	577737.12,	4165718.50,	8.10,	0.00)	DC	NA
	8TH HIGHEST VALUE IS	31.96341	AT (	577770.00,	4165720.00,	8.20,	0.00)	DC	NA
	9TH HIGHEST VALUE IS	31.83233	AT (	577770.00,	4165730.00,	8.20,	0.00)	DC	NA
	10TH HIGHEST VALUE IS	31.71522	AT (	577780.00,	4165720.00,	8.50,	0.00)	DC	NA
S1	1ST HIGHEST VALUE IS	2.59622	AT (	577669.50,	4165719.00,	7.60,	0.00)	DC	NA
	2ND HIGHEST VALUE IS	2.59355	AT (	577679.19,	4165719.00,	7.60,	0.00)	DC	NA
	3RD HIGHEST VALUE IS	2.56826	AT (	577688.81,	4165719.00,	7.60,	0.00)	DC	NA
	4TH HIGHEST VALUE IS	2.53584	AT (	577698.50,	4165718.75,	7.70,	0.00)	DC	NA
	5TH HIGHEST VALUE IS	2.52533	AT (	577659.81,	4165719.25,	7.30,	0.00)	DC	NA
	6TH HIGHEST VALUE IS	2.50251	AT (	577708.12,	4165718.75,	7.90,	0.00)	DC	NA
	7TH HIGHEST VALUE IS	2.48063	AT (	577680.00,	4165710.00,	7.60,	0.00)	DC	NA
	8TH HIGHEST VALUE IS	2.47749	AT (	577700.00,	4165710.00,	7.90,	0.00)	DC	NA
	9TH HIGHEST VALUE IS	2.47227	AT (	577690.00,	4165710.00,	7.60,	0.00)	DC	NA
	10TH HIGHEST VALUE IS	2.46340	AT (	577670.00,	4165710.00,	7.60,	0.00)	DC	NA

*** THE SUMMARY OF MAXIMUM PERIOD (43824 HRS) RESULTS ***

** CONC OF NGAS IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC		RECEPTOR (XR, YR, ZELEV, ZFLAG)				OF TYPE	NETWORK GRID-ID
S2	1ST HIGHEST VALUE IS	2.59826	AT (	577679.19,	4165719.00,	7.60,	0.00)	DC	NA
	2ND HIGHEST VALUE IS	2.58542	AT (	577669.50,	4165719.00,	7.60,	0.00)	DC	NA
	3RD HIGHEST VALUE IS	2.58480	AT (	577688.81,	4165719.00,	7.60,	0.00)	DC	NA
	4TH HIGHEST VALUE IS	2.56158	AT (	577698.50,	4165718.75,	7.70,	0.00)	DC	NA
	5TH HIGHEST VALUE IS	2.53572	AT (	577708.12,	4165718.75,	7.90,	0.00)	DC	NA
	6TH HIGHEST VALUE IS	2.49618	AT (	577700.00,	4165710.00,	7.90,	0.00)	DC	NA
	7TH HIGHEST VALUE IS	2.49363	AT (	577659.81,	4165719.25,	7.30,	0.00)	DC	NA
	8TH HIGHEST VALUE IS	2.47958	AT (	577690.00,	4165710.00,	7.60,	0.00)	DC	NA
	9TH HIGHEST VALUE IS	2.47495	AT (	577680.00,	4165710.00,	7.60,	0.00)	DC	NA
	10TH HIGHEST VALUE IS	2.47270	AT (	577717.81,	4165718.50,	7.90,	0.00)	DC	NA
S3	1ST HIGHEST VALUE IS	2.56722	AT (	577688.81,	4165719.00,	7.60,	0.00)	DC	NA
	2ND HIGHEST VALUE IS	2.56465	AT (	577679.19,	4165719.00,	7.60,	0.00)	DC	NA
	3RD HIGHEST VALUE IS	2.55698	AT (	577698.50,	4165718.75,	7.70,	0.00)	DC	NA

	4TH HIGHEST VALUE IS	2.54187 AT (	577708.12,	4165718.75,	7.90,	0.00)	DC	NA
	5TH HIGHEST VALUE IS	2.53180 AT (	577669.50,	4165719.00,	7.60,	0.00)	DC	NA
	6TH HIGHEST VALUE IS	2.48614 AT (	577717.81,	4165718.50,	7.90,	0.00)	DC	NA
	7TH HIGHEST VALUE IS	2.48580 AT (	577700.00,	4165710.00,	7.90,	0.00)	DC	NA
	8TH HIGHEST VALUE IS	2.45819 AT (	577710.00,	4165710.00,	7.90,	0.00)	DC	NA
	9TH HIGHEST VALUE IS	2.45457 AT (	577690.00,	4165710.00,	7.60,	0.00)	DC	NA
	10TH HIGHEST VALUE IS	2.43329 AT (	577680.00,	4165710.00,	7.60,	0.00)	DC	NA
S4	1ST HIGHEST VALUE IS	2.45522 AT (	577708.12,	4165718.75,	7.90,	0.00)	DC	NA
	2ND HIGHEST VALUE IS	2.45372 AT (	577698.50,	4165718.75,	7.70,	0.00)	DC	NA
	3RD HIGHEST VALUE IS	2.44248 AT (	577688.81,	4165719.00,	7.60,	0.00)	DC	NA
	4TH HIGHEST VALUE IS	2.41458 AT (	577679.19,	4165719.00,	7.60,	0.00)	DC	NA
	5TH HIGHEST VALUE IS	2.41201 AT (	577717.81,	4165718.50,	7.90,	0.00)	DC	NA
	6TH HIGHEST VALUE IS	2.40722 AT (	577700.00,	4165710.00,	7.90,	0.00)	DC	NA
	7TH HIGHEST VALUE IS	2.39669 AT (	577710.00,	4165710.00,	7.90,	0.00)	DC	NA
	8TH HIGHEST VALUE IS	2.36667 AT (	577720.00,	4165710.00,	7.90,	0.00)	DC	NA
	9TH HIGHEST VALUE IS	2.35758 AT (	577727.50,	4165718.50,	7.90,	0.00)	DC	NA
	10TH HIGHEST VALUE IS	2.35184 AT (	577690.00,	4165710.00,	7.60,	0.00)	DC	NA

**MODELOPTs:
CONC URBAN ELEV GRDRIS

*** THE SUMMARY OF MAXIMUM PERIOD (43824 HRS) RESULTS ***

** CONC OF NGAS IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC		RECEPTOR (XR, YR, ZELEV, ZFLAG)			OF	TYPE	NETWORK GRID-ID
S5	1ST HIGHEST VALUE IS	2.47205 AT (	577708.12,	4165718.75,	7.90,	0.00)	DC		NA
	2ND HIGHEST VALUE IS	2.45771 AT (	577698.50,	4165718.75,	7.70,	0.00)	DC		NA
	3RD HIGHEST VALUE IS	2.43725 AT (	577717.81,	4165718.50,	7.90,	0.00)	DC		NA
	4TH HIGHEST VALUE IS	2.43091 AT (	577688.81,	4165719.00,	7.60,	0.00)	DC		NA
	5TH HIGHEST VALUE IS	2.40512 AT (	577710.00,	4165710.00,	7.90,	0.00)	DC		NA
	6TH HIGHEST VALUE IS	2.40280 AT (	577700.00,	4165710.00,	7.90,	0.00)	DC		NA
	7TH HIGHEST VALUE IS	2.38903 AT (	577727.50,	4165718.50,	7.90,	0.00)	DC		NA
	8TH HIGHEST VALUE IS	2.38490 AT (	577720.00,	4165710.00,	7.90,	0.00)	DC		NA
	9TH HIGHEST VALUE IS	2.38368 AT (	577679.19,	4165719.00,	7.60,	0.00)	DC		NA
	10TH HIGHEST VALUE IS	2.35158 AT (	577737.12,	4165718.50,	8.10,	0.00)	DC		NA
S6	1ST HIGHEST VALUE IS	2.48278 AT (	577708.12,	4165718.75,	7.90,	0.00)	DC		NA
	2ND HIGHEST VALUE IS	2.45803 AT (	577717.81,	4165718.50,	7.90,	0.00)	DC		NA
	3RD HIGHEST VALUE IS	2.45371 AT (	577698.50,	4165718.75,	7.70,	0.00)	DC		NA
	4TH HIGHEST VALUE IS	2.41732 AT (	577727.50,	4165718.50,	7.90,	0.00)	DC		NA
	5TH HIGHEST VALUE IS	2.40909 AT (	577688.81,	4165719.00,	7.60,	0.00)	DC		NA
	6TH HIGHEST VALUE IS	2.40707 AT (	577710.00,	4165710.00,	7.90,	0.00)	DC		NA
	7TH HIGHEST VALUE IS	2.39823 AT (	577720.00,	4165710.00,	7.90,	0.00)	DC		NA

	8TH HIGHEST VALUE IS	2.39002 AT (	577700.00,	4165710.00,	7.90,	0.00)	DC	NA
	9TH HIGHEST VALUE IS	2.38614 AT (	577737.12,	4165718.50,	8.10,	0.00)	DC	NA
	10TH HIGHEST VALUE IS	2.36948 AT (	577730.00,	4165710.00,	7.90,	0.00)	DC	NA
S7	1ST HIGHEST VALUE IS	2.48638 AT (	577708.12,	4165718.75,	7.90,	0.00)	DC	NA
	2ND HIGHEST VALUE IS	2.47358 AT (	577717.81,	4165718.50,	7.90,	0.00)	DC	NA
	3RD HIGHEST VALUE IS	2.44200 AT (	577727.50,	4165718.50,	7.90,	0.00)	DC	NA
	4TH HIGHEST VALUE IS	2.44021 AT (	577698.50,	4165718.75,	7.70,	0.00)	DC	NA
	5TH HIGHEST VALUE IS	2.41839 AT (	577737.12,	4165718.50,	8.10,	0.00)	DC	NA
	6TH HIGHEST VALUE IS	2.40586 AT (	577720.00,	4165710.00,	7.90,	0.00)	DC	NA
	7TH HIGHEST VALUE IS	2.40143 AT (	577710.00,	4165710.00,	7.90,	0.00)	DC	NA
	8TH HIGHEST VALUE IS	2.38725 AT (	577730.00,	4165710.00,	7.90,	0.00)	DC	NA
	9TH HIGHEST VALUE IS	2.38324 AT (	577740.00,	4165710.00,	8.20,	0.00)	DC	NA
	10TH HIGHEST VALUE IS	2.37518 AT (	577688.81,	4165719.00,	7.60,	0.00)	DC	NA

*** THE SUMMARY OF MAXIMUM PERIOD (43824 HRS) RESULTS ***

** CONC OF NGAS IN MICROGRAMS/M**3 **

GROUP ID	AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZFLAG)				OF TYPE	NETWORK GRID-ID
S8	1ST HIGHEST VALUE IS	2.57619 AT (	577780.00,	4165730.00,	8.50,	0.00)	DC	NA
	2ND HIGHEST VALUE IS	2.54966 AT (	577790.00,	4165730.00,	8.50,	0.00)	DC	NA
	3RD HIGHEST VALUE IS	2.53741 AT (	577780.00,	4165720.00,	8.50,	0.00)	DC	NA
	4TH HIGHEST VALUE IS	2.53386 AT (	577790.00,	4165720.00,	8.50,	0.00)	DC	NA
	5TH HIGHEST VALUE IS	2.52029 AT (	577770.00,	4165730.00,	8.20,	0.00)	DC	NA
	6TH HIGHEST VALUE IS	2.50512 AT (	577800.00,	4165720.00,	8.50,	0.00)	DC	NA
	7TH HIGHEST VALUE IS	2.50195 AT (	577800.00,	4165730.00,	8.50,	0.00)	DC	NA
	8TH HIGHEST VALUE IS	2.49436 AT (	577810.00,	4165720.00,	8.80,	0.00)	DC	NA
	9TH HIGHEST VALUE IS	2.47987 AT (	577770.00,	4165740.00,	8.20,	0.00)	DC	NA
	10TH HIGHEST VALUE IS	2.47935 AT (	577790.00,	4165740.00,	8.50,	0.00)	DC	NA
S9	1ST HIGHEST VALUE IS	2.56491 AT (	577780.00,	4165730.00,	8.50,	0.00)	DC	NA
	2ND HIGHEST VALUE IS	2.53917 AT (	577780.00,	4165720.00,	8.50,	0.00)	DC	NA
	3RD HIGHEST VALUE IS	2.52847 AT (	577770.00,	4165730.00,	8.20,	0.00)	DC	NA
	4TH HIGHEST VALUE IS	2.52595 AT (	577790.00,	4165730.00,	8.50,	0.00)	DC	NA
	5TH HIGHEST VALUE IS	2.52099 AT (	577790.00,	4165720.00,	8.50,	0.00)	DC	NA
	6TH HIGHEST VALUE IS	2.50472 AT (	577760.00,	4165730.00,	8.20,	0.00)	DC	NA
	7TH HIGHEST VALUE IS	2.48983 AT (	577756.31,	4165734.50,	8.20,	0.00)	DC	NA
	8TH HIGHEST VALUE IS	2.48150 AT (	577800.00,	4165720.00,	8.50,	0.00)	DC	NA
	9TH HIGHEST VALUE IS	2.48118 AT (	577770.00,	4165720.00,	8.20,	0.00)	DC	NA
	10TH HIGHEST VALUE IS	2.47805 AT (	577770.00,	4165740.00,	8.20,	0.00)	DC	NA

S10	1ST HIGHEST VALUE IS	2.54653 AT (	577780.00,	4165730.00,	8.50,	0.00)	DC	NA
	2ND HIGHEST VALUE IS	2.53246 AT (	577780.00,	4165720.00,	8.50,	0.00)	DC	NA
	3RD HIGHEST VALUE IS	2.52666 AT (	577770.00,	4165730.00,	8.20,	0.00)	DC	NA
	4TH HIGHEST VALUE IS	2.52230 AT (	577760.00,	4165730.00,	8.20,	0.00)	DC	NA
	5TH HIGHEST VALUE IS	2.50997 AT (	577756.31,	4165734.50,	8.20,	0.00)	DC	NA
	6TH HIGHEST VALUE IS	2.50199 AT (	577790.00,	4165720.00,	8.50,	0.00)	DC	NA
	7TH HIGHEST VALUE IS	2.49741 AT (	577790.00,	4165730.00,	8.50,	0.00)	DC	NA
	8TH HIGHEST VALUE IS	2.49268 AT (	577770.00,	4165720.00,	8.20,	0.00)	DC	NA
	9TH HIGHEST VALUE IS	2.48866 AT (	577756.38,	4165725.00,	8.20,	0.00)	DC	NA
	10TH HIGHEST VALUE IS	2.48024 AT (	577760.00,	4165740.00,	8.20,	0.00)	DC	NA

*** THE SUMMARY OF MAXIMUM PERIOD (43824 HRS) RESULTS ***

** CONC OF NGAS IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC		RECEPTOR (XR, YR, ZELEV, ZFLAG)			OF TYPE	NETWORK GRID-ID
SA11	1ST HIGHEST VALUE IS	32.73498 AT (	577756.38,	4165725.00,	8.20,	0.00)	DC	NA
	2ND HIGHEST VALUE IS	32.54340 AT (	577746.81,	4165718.25,	8.20,	0.00)	DC	NA
	3RD HIGHEST VALUE IS	32.49900 AT (	577760.00,	4165730.00,	8.20,	0.00)	DC	NA
	4TH HIGHEST VALUE IS	32.45528 AT (	577756.38,	4165718.25,	8.20,	0.00)	DC	NA
	5TH HIGHEST VALUE IS	32.45525 AT (	577756.31,	4165734.50,	8.20,	0.00)	DC	NA
	6TH HIGHEST VALUE IS	32.44508 AT (	577760.00,	4165720.00,	8.20,	0.00)	DC	NA
	7TH HIGHEST VALUE IS	32.15517 AT (	577737.12,	4165718.50,	8.10,	0.00)	DC	NA
	8TH HIGHEST VALUE IS	31.96341 AT (	577770.00,	4165720.00,	8.20,	0.00)	DC	NA
	9TH HIGHEST VALUE IS	31.83233 AT (	577770.00,	4165730.00,	8.20,	0.00)	DC	NA
	10TH HIGHEST VALUE IS	31.71522 AT (	577780.00,	4165720.00,	8.50,	0.00)	DC	NA
1	1ST HIGHEST VALUE IS	2.59622 AT (	577669.50,	4165719.00,	7.60,	0.00)	DC	NA
	2ND HIGHEST VALUE IS	2.59355 AT (	577679.19,	4165719.00,	7.60,	0.00)	DC	NA
	3RD HIGHEST VALUE IS	2.56826 AT (	577688.81,	4165719.00,	7.60,	0.00)	DC	NA
	4TH HIGHEST VALUE IS	2.53584 AT (	577698.50,	4165718.75,	7.70,	0.00)	DC	NA
	5TH HIGHEST VALUE IS	2.52533 AT (	577659.81,	4165719.25,	7.30,	0.00)	DC	NA
	6TH HIGHEST VALUE IS	2.50251 AT (	577708.12,	4165718.75,	7.90,	0.00)	DC	NA
	7TH HIGHEST VALUE IS	2.48063 AT (	577680.00,	4165710.00,	7.60,	0.00)	DC	NA
	8TH HIGHEST VALUE IS	2.47749 AT (	577700.00,	4165710.00,	7.90,	0.00)	DC	NA
	9TH HIGHEST VALUE IS	2.47227 AT (	577690.00,	4165710.00,	7.60,	0.00)	DC	NA
	10TH HIGHEST VALUE IS	2.46340 AT (	577670.00,	4165710.00,	7.60,	0.00)	DC	NA

CONC URBAN ELEV GRDRIS

*** THE SUMMARY OF MAXIMUM PERIOD (43824 HRS) RESULTS ***

** CONC OF NGAS IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZFLAG)				OF TYPE	NETWORK GRID-ID
2	1ST HIGHEST VALUE IS	2.59826 AT	577679.19,	4165719.00,	7.60,	0.00)	DC	NA
	2ND HIGHEST VALUE IS	2.58542 AT	577669.50,	4165719.00,	7.60,	0.00)	DC	NA
	3RD HIGHEST VALUE IS	2.58480 AT	577688.81,	4165719.00,	7.60,	0.00)	DC	NA
	4TH HIGHEST VALUE IS	2.56158 AT	577698.50,	4165718.75,	7.70,	0.00)	DC	NA
	5TH HIGHEST VALUE IS	2.53572 AT	577708.12,	4165718.75,	7.90,	0.00)	DC	NA
	6TH HIGHEST VALUE IS	2.49618 AT	577700.00,	4165710.00,	7.90,	0.00)	DC	NA
	7TH HIGHEST VALUE IS	2.49363 AT	577659.81,	4165719.25,	7.30,	0.00)	DC	NA
	8TH HIGHEST VALUE IS	2.47958 AT	577690.00,	4165710.00,	7.60,	0.00)	DC	NA
	9TH HIGHEST VALUE IS	2.47495 AT	577680.00,	4165710.00,	7.60,	0.00)	DC	NA
	10TH HIGHEST VALUE IS	2.47270 AT	577717.81,	4165718.50,	7.90,	0.00)	DC	NA
3	1ST HIGHEST VALUE IS	2.56722 AT	577688.81,	4165719.00,	7.60,	0.00)	DC	NA
	2ND HIGHEST VALUE IS	2.56465 AT	577679.19,	4165719.00,	7.60,	0.00)	DC	NA
	3RD HIGHEST VALUE IS	2.55698 AT	577698.50,	4165718.75,	7.70,	0.00)	DC	NA
	4TH HIGHEST VALUE IS	2.54187 AT	577708.12,	4165718.75,	7.90,	0.00)	DC	NA
	5TH HIGHEST VALUE IS	2.53180 AT	577669.50,	4165719.00,	7.60,	0.00)	DC	NA
	6TH HIGHEST VALUE IS	2.48614 AT	577717.81,	4165718.50,	7.90,	0.00)	DC	NA
	7TH HIGHEST VALUE IS	2.48580 AT	577700.00,	4165710.00,	7.90,	0.00)	DC	NA
	8TH HIGHEST VALUE IS	2.45819 AT	577710.00,	4165710.00,	7.90,	0.00)	DC	NA
	9TH HIGHEST VALUE IS	2.45457 AT	577690.00,	4165710.00,	7.60,	0.00)	DC	NA
	10TH HIGHEST VALUE IS	2.43329 AT	577680.00,	4165710.00,	7.60,	0.00)	DC	NA
4	1ST HIGHEST VALUE IS	2.45522 AT	577708.12,	4165718.75,	7.90,	0.00)	DC	NA
	2ND HIGHEST VALUE IS	2.45372 AT	577698.50,	4165718.75,	7.70,	0.00)	DC	NA
	3RD HIGHEST VALUE IS	2.44248 AT	577688.81,	4165719.00,	7.60,	0.00)	DC	NA
	4TH HIGHEST VALUE IS	2.41458 AT	577679.19,	4165719.00,	7.60,	0.00)	DC	NA
	5TH HIGHEST VALUE IS	2.41201 AT	577717.81,	4165718.50,	7.90,	0.00)	DC	NA
	6TH HIGHEST VALUE IS	2.40722 AT	577700.00,	4165710.00,	7.90,	0.00)	DC	NA
	7TH HIGHEST VALUE IS	2.39669 AT	577710.00,	4165710.00,	7.90,	0.00)	DC	NA
	8TH HIGHEST VALUE IS	2.36667 AT	577720.00,	4165710.00,	7.90,	0.00)	DC	NA
	9TH HIGHEST VALUE IS	2.35758 AT	577727.50,	4165718.50,	7.90,	0.00)	DC	NA
	10TH HIGHEST VALUE IS	2.35184 AT	577690.00,	4165710.00,	7.60,	0.00)	DC	NA

** CONC OF NGAS IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZFLAG)			OF TYPE	NETWORK GRID-ID
5	1ST HIGHEST VALUE IS	2.47205 AT (	577708.12,	4165718.75,	7.90, 0.00)	DC	NA
	2ND HIGHEST VALUE IS	2.45771 AT (	577698.50,	4165718.75,	7.70, 0.00)	DC	NA
	3RD HIGHEST VALUE IS	2.43725 AT (	577717.81,	4165718.50,	7.90, 0.00)	DC	NA
	4TH HIGHEST VALUE IS	2.43091 AT (	577688.81,	4165719.00,	7.60, 0.00)	DC	NA
	5TH HIGHEST VALUE IS	2.40512 AT (	577710.00,	4165710.00,	7.90, 0.00)	DC	NA
	6TH HIGHEST VALUE IS	2.40280 AT (	577700.00,	4165710.00,	7.90, 0.00)	DC	NA
	7TH HIGHEST VALUE IS	2.38903 AT (	577727.50,	4165718.50,	7.90, 0.00)	DC	NA
	8TH HIGHEST VALUE IS	2.38490 AT (	577720.00,	4165710.00,	7.90, 0.00)	DC	NA
	9TH HIGHEST VALUE IS	2.38368 AT (	577679.19,	4165719.00,	7.60, 0.00)	DC	NA
	10TH HIGHEST VALUE IS	2.35158 AT (	577737.12,	4165718.50,	8.10, 0.00)	DC	NA
6	1ST HIGHEST VALUE IS	2.48278 AT (	577708.12,	4165718.75,	7.90, 0.00)	DC	NA
	2ND HIGHEST VALUE IS	2.45803 AT (	577717.81,	4165718.50,	7.90, 0.00)	DC	NA
	3RD HIGHEST VALUE IS	2.45371 AT (	577698.50,	4165718.75,	7.70, 0.00)	DC	NA
	4TH HIGHEST VALUE IS	2.41732 AT (	577727.50,	4165718.50,	7.90, 0.00)	DC	NA
	5TH HIGHEST VALUE IS	2.40909 AT (	577688.81,	4165719.00,	7.60, 0.00)	DC	NA
	6TH HIGHEST VALUE IS	2.40707 AT (	577710.00,	4165710.00,	7.90, 0.00)	DC	NA
	7TH HIGHEST VALUE IS	2.39823 AT (	577720.00,	4165710.00,	7.90, 0.00)	DC	NA
	8TH HIGHEST VALUE IS	2.39002 AT (	577700.00,	4165710.00,	7.90, 0.00)	DC	NA
	9TH HIGHEST VALUE IS	2.38614 AT (	577737.12,	4165718.50,	8.10, 0.00)	DC	NA
	10TH HIGHEST VALUE IS	2.36948 AT (	577730.00,	4165710.00,	7.90, 0.00)	DC	NA
7	1ST HIGHEST VALUE IS	2.48638 AT (	577708.12,	4165718.75,	7.90, 0.00)	DC	NA
	2ND HIGHEST VALUE IS	2.47358 AT (	577717.81,	4165718.50,	7.90, 0.00)	DC	NA
	3RD HIGHEST VALUE IS	2.44200 AT (	577727.50,	4165718.50,	7.90, 0.00)	DC	NA
	4TH HIGHEST VALUE IS	2.44021 AT (	577698.50,	4165718.75,	7.70, 0.00)	DC	NA
	5TH HIGHEST VALUE IS	2.41839 AT (	577737.12,	4165718.50,	8.10, 0.00)	DC	NA
	6TH HIGHEST VALUE IS	2.40586 AT (	577720.00,	4165710.00,	7.90, 0.00)	DC	NA
	7TH HIGHEST VALUE IS	2.40143 AT (	577710.00,	4165710.00,	7.90, 0.00)	DC	NA
	8TH HIGHEST VALUE IS	2.38725 AT (	577730.00,	4165710.00,	7.90, 0.00)	DC	NA
	9TH HIGHEST VALUE IS	2.38324 AT (	577740.00,	4165710.00,	8.20, 0.00)	DC	NA
	10TH HIGHEST VALUE IS	2.37518 AT (	577688.81,	4165719.00,	7.60, 0.00)	DC	NA

*** THE SUMMARY OF MAXIMUM PERIOD (43824 HRS) RESULTS ***

** CONC OF NGAS IN MICROGRAMS/M**3 **

NETWORK

GROUP ID		AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZFLAG)				OF TYPE	GRID-ID
14	1ST HIGHEST VALUE IS	2.45416 AT (	577756.38,	4165725.00,	8.20,	0.00)	DC	NA
	2ND HIGHEST VALUE IS	2.43904 AT (	577746.81,	4165718.25,	8.20,	0.00)	DC	NA
	3RD HIGHEST VALUE IS	2.43445 AT (	577756.38,	4165718.25,	8.20,	0.00)	DC	NA
	4TH HIGHEST VALUE IS	2.43384 AT (	577760.00,	4165720.00,	8.20,	0.00)	DC	NA
	5TH HIGHEST VALUE IS	2.43149 AT (	577760.00,	4165730.00,	8.20,	0.00)	DC	NA
	6TH HIGHEST VALUE IS	2.42312 AT (	577756.31,	4165734.50,	8.20,	0.00)	DC	NA
	7TH HIGHEST VALUE IS	2.40321 AT (	577737.12,	4165718.50,	8.10,	0.00)	DC	NA
	8TH HIGHEST VALUE IS	2.39678 AT (	577770.00,	4165720.00,	8.20,	0.00)	DC	NA
	9TH HIGHEST VALUE IS	2.37938 AT (	577770.00,	4165730.00,	8.20,	0.00)	DC	NA
	10TH HIGHEST VALUE IS	2.37846 AT (	577780.00,	4165720.00,	8.50,	0.00)	DC	NA
13	1ST HIGHEST VALUE IS	2.46739 AT (	577756.38,	4165725.00,	8.20,	0.00)	DC	NA
	2ND HIGHEST VALUE IS	2.45312 AT (	577760.00,	4165730.00,	8.20,	0.00)	DC	NA
	3RD HIGHEST VALUE IS	2.44592 AT (	577760.00,	4165720.00,	8.20,	0.00)	DC	NA
	4TH HIGHEST VALUE IS	2.44410 AT (	577756.31,	4165734.50,	8.20,	0.00)	DC	NA
	5TH HIGHEST VALUE IS	2.43998 AT (	577756.38,	4165718.25,	8.20,	0.00)	DC	NA
	6TH HIGHEST VALUE IS	2.43014 AT (	577746.81,	4165718.25,	8.20,	0.00)	DC	NA
	7TH HIGHEST VALUE IS	2.41881 AT (	577770.00,	4165720.00,	8.20,	0.00)	DC	NA
	8TH HIGHEST VALUE IS	2.40925 AT (	577780.00,	4165720.00,	8.50,	0.00)	DC	NA
	9TH HIGHEST VALUE IS	2.40908 AT (	577770.00,	4165730.00,	8.20,	0.00)	DC	NA
	10TH HIGHEST VALUE IS	2.38681 AT (	577780.00,	4165730.00,	8.50,	0.00)	DC	NA
12	1ST HIGHEST VALUE IS	2.47368 AT (	577756.38,	4165725.00,	8.20,	0.00)	DC	NA
	2ND HIGHEST VALUE IS	2.46920 AT (	577760.00,	4165730.00,	8.20,	0.00)	DC	NA
	3RD HIGHEST VALUE IS	2.45928 AT (	577756.31,	4165734.50,	8.20,	0.00)	DC	NA
	4TH HIGHEST VALUE IS	2.45128 AT (	577760.00,	4165720.00,	8.20,	0.00)	DC	NA
	5TH HIGHEST VALUE IS	2.43778 AT (	577756.38,	4165718.25,	8.20,	0.00)	DC	NA
	6TH HIGHEST VALUE IS	2.43686 AT (	577780.00,	4165720.00,	8.50,	0.00)	DC	NA
	7TH HIGHEST VALUE IS	2.43606 AT (	577770.00,	4165720.00,	8.20,	0.00)	DC	NA
	8TH HIGHEST VALUE IS	2.43508 AT (	577770.00,	4165730.00,	8.20,	0.00)	DC	NA
	9TH HIGHEST VALUE IS	2.42159 AT (	577780.00,	4165730.00,	8.50,	0.00)	DC	NA
	10TH HIGHEST VALUE IS	2.41119 AT (	577746.81,	4165718.25,	8.20,	0.00)	DC	NA

**MODELOPTs:
CONC URBAN ELEV GRDRIS

*** THE SUMMARY OF MAXIMUM PERIOD (43824 HRS) RESULTS ***

** CONC OF NGAS IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZFLAG)				OF TYPE	NETWORK GRID-ID
11	1ST HIGHEST VALUE IS	2.52556 AT (	577760.00,	4165730.00,	8.20,	0.00)	DC	NA

	2ND HIGHEST VALUE IS	2.51922 AT (	577756.38,	4165725.00,	8.20,	0.00)	DC	NA
	3RD HIGHEST VALUE IS	2.51665 AT (	577756.31,	4165734.50,	8.20,	0.00)	DC	NA
	4TH HIGHEST VALUE IS	2.49922 AT (	577770.00,	4165730.00,	8.20,	0.00)	DC	NA
	5TH HIGHEST VALUE IS	2.49856 AT (	577780.00,	4165720.00,	8.50,	0.00)	DC	NA
	6TH HIGHEST VALUE IS	2.49342 AT (	577760.00,	4165720.00,	8.20,	0.00)	DC	NA
	7TH HIGHEST VALUE IS	2.49268 AT (	577780.00,	4165730.00,	8.50,	0.00)	DC	NA
	8TH HIGHEST VALUE IS	2.48867 AT (	577770.00,	4165720.00,	8.20,	0.00)	DC	NA
	9TH HIGHEST VALUE IS	2.47204 AT (	577756.38,	4165718.25,	8.20,	0.00)	DC	NA
	10TH HIGHEST VALUE IS	2.46545 AT (	577760.00,	4165740.00,	8.20,	0.00)	DC	NA
10	1ST HIGHEST VALUE IS	2.54653 AT (	577780.00,	4165730.00,	8.50,	0.00)	DC	NA
	2ND HIGHEST VALUE IS	2.53246 AT (	577780.00,	4165720.00,	8.50,	0.00)	DC	NA
	3RD HIGHEST VALUE IS	2.52666 AT (	577770.00,	4165730.00,	8.20,	0.00)	DC	NA
	4TH HIGHEST VALUE IS	2.52230 AT (	577760.00,	4165730.00,	8.20,	0.00)	DC	NA
	5TH HIGHEST VALUE IS	2.50997 AT (	577756.31,	4165734.50,	8.20,	0.00)	DC	NA
	6TH HIGHEST VALUE IS	2.50199 AT (	577790.00,	4165720.00,	8.50,	0.00)	DC	NA
	7TH HIGHEST VALUE IS	2.49741 AT (	577790.00,	4165730.00,	8.50,	0.00)	DC	NA
	8TH HIGHEST VALUE IS	2.49268 AT (	577770.00,	4165720.00,	8.20,	0.00)	DC	NA
	9TH HIGHEST VALUE IS	2.48866 AT (	577756.38,	4165725.00,	8.20,	0.00)	DC	NA
	10TH HIGHEST VALUE IS	2.48024 AT (	577760.00,	4165740.00,	8.20,	0.00)	DC	NA
9	1ST HIGHEST VALUE IS	2.56491 AT (	577780.00,	4165730.00,	8.50,	0.00)	DC	NA
	2ND HIGHEST VALUE IS	2.53917 AT (	577780.00,	4165720.00,	8.50,	0.00)	DC	NA
	3RD HIGHEST VALUE IS	2.52847 AT (	577770.00,	4165730.00,	8.20,	0.00)	DC	NA
	4TH HIGHEST VALUE IS	2.52595 AT (	577790.00,	4165730.00,	8.50,	0.00)	DC	NA
	5TH HIGHEST VALUE IS	2.52099 AT (	577790.00,	4165720.00,	8.50,	0.00)	DC	NA
	6TH HIGHEST VALUE IS	2.50472 AT (	577760.00,	4165730.00,	8.20,	0.00)	DC	NA
	7TH HIGHEST VALUE IS	2.48983 AT (	577756.31,	4165734.50,	8.20,	0.00)	DC	NA
	8TH HIGHEST VALUE IS	2.48150 AT (	577800.00,	4165720.00,	8.50,	0.00)	DC	NA
	9TH HIGHEST VALUE IS	2.48118 AT (	577770.00,	4165720.00,	8.20,	0.00)	DC	NA
	10TH HIGHEST VALUE IS	2.47805 AT (	577770.00,	4165740.00,	8.20,	0.00)	DC	NA

**MODELOPTs:
CONC URBAN ELEV GRDRIS

*** THE SUMMARY OF MAXIMUM PERIOD (43824 HRS) RESULTS ***

** CONC OF NGAS IN MICROGRAMS/M**3 **

GROUP ID	AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZFLAG)	OF TYPE	NETWORK GRID-ID
8	1ST HIGHEST VALUE IS	2.57619 AT (577780.00, 4165730.00, 8.50, 0.00)	DC	NA
	2ND HIGHEST VALUE IS	2.54966 AT (577790.00, 4165730.00, 8.50, 0.00)	DC	NA
	3RD HIGHEST VALUE IS	2.53741 AT (577780.00, 4165720.00, 8.50, 0.00)	DC	NA
	4TH HIGHEST VALUE IS	2.53386 AT (577790.00, 4165720.00, 8.50, 0.00)	DC	NA
	5TH HIGHEST VALUE IS	2.52029 AT (577770.00, 4165730.00, 8.20, 0.00)	DC	NA

6TH HIGHEST VALUE IS	2.50512 AT (	577800.00,	4165720.00,	8.50,	0.00)	DC	NA
7TH HIGHEST VALUE IS	2.50195 AT (	577800.00,	4165730.00,	8.50,	0.00)	DC	NA
8TH HIGHEST VALUE IS	2.49436 AT (	577810.00,	4165720.00,	8.80,	0.00)	DC	NA
9TH HIGHEST VALUE IS	2.47987 AT (	577770.00,	4165740.00,	8.20,	0.00)	DC	NA
10TH HIGHEST VALUE IS	2.47935 AT (	577790.00,	4165740.00,	8.50,	0.00)	DC	NA

*** RECEPTOR TYPES: GC = GRIDCART
GP = GRIDPOLR
DC = DISCCART
DP = DISCPOLR
BD = BOUNDARY

**MODELOPTs:
CONC URBAN ELEV GRDRIS

*** THE SUMMARY OF HIGHEST 1-HR RESULTS ***

** CONC OF NGAS IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZFLAG)		OF TYPE	NETWORK GRID-ID
ALL	HIGH 1ST HIGH VALUE IS	241.45547	ON 90061314: AT (	577733.62,	4165788.25, 7.90, 0.00)	DC	NA
NATGAS	HIGH 1ST HIGH VALUE IS	241.45547	ON 90061314: AT (	577733.62,	4165788.25, 7.90, 0.00)	DC	NA
S1	HIGH 1ST HIGH VALUE IS	64.78739	ON 93051913: AT (	577575.88,	4165815.75, 6.90, 0.00)	DC	NA
S2	HIGH 1ST HIGH VALUE IS	65.94718	ON 93051913: AT (	577585.62,	4165815.50, 7.00, 0.00)	DC	NA
S3	HIGH 1ST HIGH VALUE IS	64.50179	ON 90050910: AT (	577570.00,	4165830.00, 7.00, 0.00)	DC	NA
S4	HIGH 1ST HIGH VALUE IS	17.94952	ON 92042915: AT (	577660.00,	4165840.00, 7.60, 0.00)	DC	NA
S5	HIGH 1ST HIGH VALUE IS	18.24152	ON 92042915: AT (	577660.00,	4165840.00, 7.60, 0.00)	DC	NA
S6	HIGH 1ST HIGH VALUE IS	18.29713	ON 92042915: AT (	577660.00,	4165840.00, 7.60, 0.00)	DC	NA
S7	HIGH 1ST HIGH VALUE IS	18.26651	ON 92042915: AT (	577670.00,	4165840.00, 7.60, 0.00)	DC	NA
S8	HIGH 1ST HIGH VALUE IS	19.20976	ON 91031413: AT (	577755.88,	4165762.50, 8.20, 0.00)	DC	NA
S9	HIGH 1ST HIGH VALUE IS	18.93040	ON 91031413: AT (	577755.88,	4165762.50, 8.20, 0.00)	DC	NA
S10	HIGH 1ST HIGH VALUE IS	18.56981	ON 91031413: AT (	577755.88,	4165762.50, 8.20, 0.00)	DC	NA

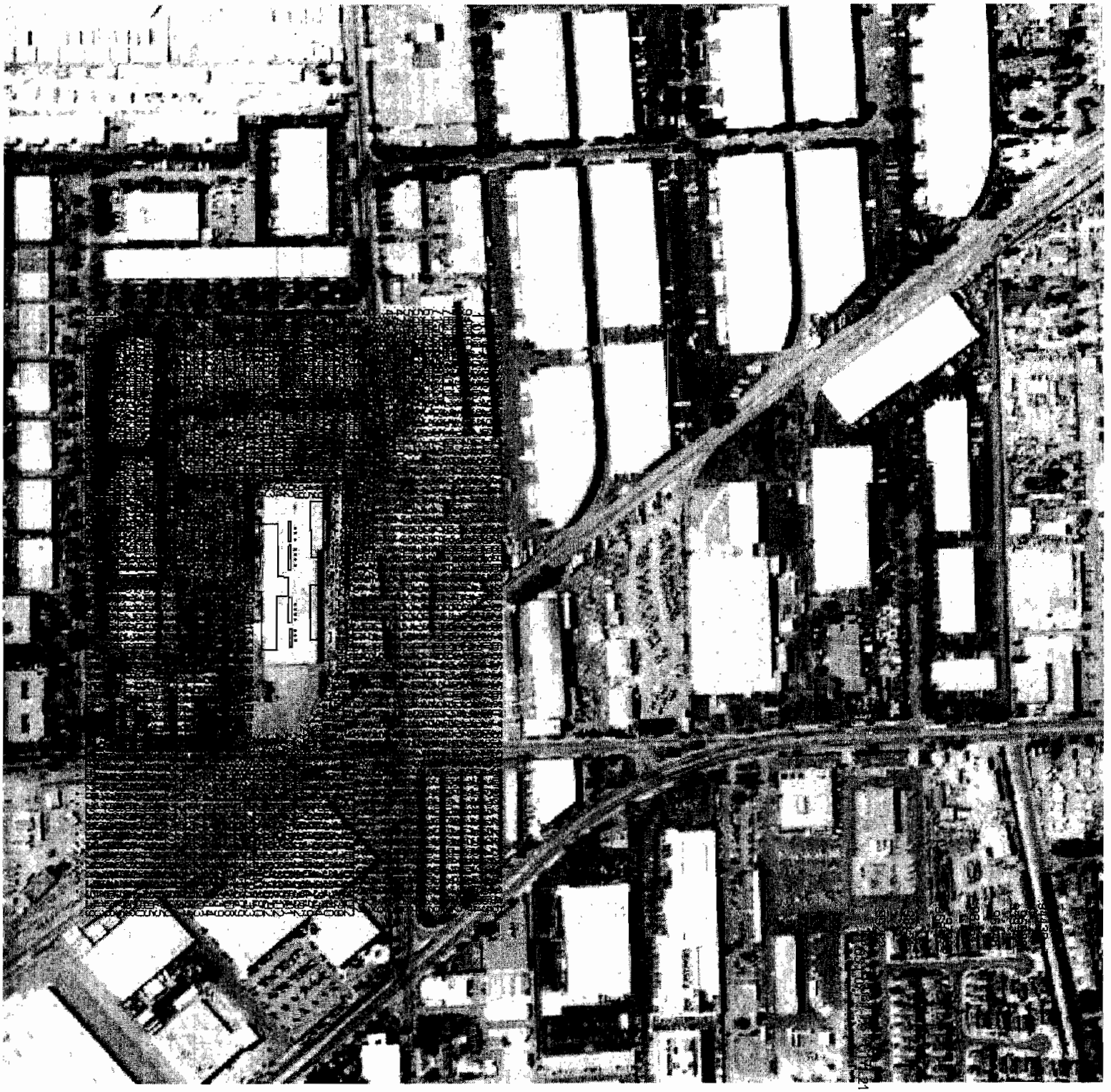
S11	HIGH	1ST HIGH VALUE IS	18.22219	ON 90070518: AT (	577710.00,	4165710.00,	7.90,	0.00)	DC	NA
S12	HIGH	1ST HIGH VALUE IS	17.73004	ON 93081817: AT (	577710.00,	4165710.00,	7.90,	0.00)	DC	NA
S13	HIGH	1ST HIGH VALUE IS	17.81702	ON 90070518: AT (	577700.00,	4165710.00,	7.90,	0.00)	DC	NA
S14	HIGH	1ST HIGH VALUE IS	17.74215	ON 93042016: AT (	577708.12,	4165718.75,	7.90,	0.00)	DC	NA
SA11	HIGH	1ST HIGH VALUE IS	241.45547	ON 90061314: AT (	577733.62,	4165788.25,	7.90,	0.00)	DC	NA
1	HIGH	1ST HIGH VALUE IS	64.78739	ON 93051913: AT (	577575.88,	4165815.75,	6.90,	0.00)	DC	NA
2	HIGH	1ST HIGH VALUE IS	65.94718	ON 93051913: AT (	577585.62,	4165815.50,	7.00,	0.00)	DC	NA
3	HIGH	1ST HIGH VALUE IS	64.50179	ON 90050910: AT (	577570.00,	4165830.00,	7.00,	0.00)	DC	NA

**MODELOPTs:
CONC URBAN ELEV GRDRIS

*** THE SUMMARY OF HIGHEST 1-HR RESULTS ***

** CONC OF NGAS IN MICROGRAMS/M**3 **

GROUP ID			AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZFLAG)				OF	TYPE	NETWORK GRID-ID
4	HIGH	1ST HIGH VALUE IS	17.94952	ON 92042915: AT (	577660.00,	4165840.00,	7.60,	0.00)	DC	NA
5	HIGH	1ST HIGH VALUE IS	18.24152	ON 92042915: AT (	577660.00,	4165840.00,	7.60,	0.00)	DC	NA
6	HIGH	1ST HIGH VALUE IS	18.29713	ON 92042915: AT (	577660.00,	4165840.00,	7.60,	0.00)	DC	NA
7	HIGH	1ST HIGH VALUE IS	18.26651	ON 92042915: AT (	577670.00,	4165840.00,	7.60,	0.00)	DC	NA
14	HIGH	1ST HIGH VALUE IS	17.74215	ON 93042016: AT (	577708.12,	4165718.75,	7.90,	0.00)	DC	NA
13	HIGH	1ST HIGH VALUE IS	17.81702	ON 90070518: AT (	577700.00,	4165710.00,	7.90,	0.00)	DC	NA
12	HIGH	1ST HIGH VALUE IS	17.73004	ON 93081817: AT (	577710.00,	4165710.00,	7.90,	0.00)	DC	NA
11	HIGH	1ST HIGH VALUE IS	18.22219	ON 90070518: AT (	577710.00,	4165710.00,	7.90,	0.00)	DC	NA
10	HIGH	1ST HIGH VALUE IS	18.56981	ON 91031413: AT (	577755.88,	4165762.50,	8.20,	0.00)	DC	NA
9	HIGH	1ST HIGH VALUE IS	18.93040	ON 91031413: AT (	577755.88,	4165762.50,	8.20,	0.00)	DC	NA
8	HIGH	1ST HIGH VALUE IS	19.20976	ON 91031413: AT (	577755.88,	4165762.50,	8.20,	0.00)	DC	NA



Health Risk Screening Analysis Summary for Standby Generator Diesel Engine
Facility =Eastshore Energy Center, (Hayward, CA)

- **Plant #18041; Application #15195**
- **ISC Air Dispersion Model Used**
- **Union City Meteorological Data Used**
- **Hayward Terrain Data Used**
- **Daytime Scalars Used**
- **Urban Land Use** @ pt of Max for Natural Gas

Health Risk Estimates:

Receptor	Max. Annual Emission Rate (lb/yr)	Max. Annual Emission Rate (g/sec)	Max. Annual Avg. Chi/Q (ug/m^3 per g/sec)	Annual Average Exposure Concentration[1] (ug/m^3)	Inhalation Dose[2] (mg/kg-day)	Diesel PM: Inhalation Cancer Potency Factor (CPF) (mg/kg-day)$^{-1}$	Diesel PM: Inhalation Reference Exposure Level (REL) (ug/m^3)	***Max. Cancer Risk***[3]	***Max. Non-cancer Hazard Quotient***[4]
Resident	4.5434	6.5E-05	4.8E-01	0.00003	9.5E-09	1.1E+00	5.0E+00	***1.05E-08***	***6.3E-06***
Worker	4.5434	6.5E-05	1.8E+01	0.00115	2.9E-07	1.1E+00	5.0E+00	***3.16E-07***	***2.2E-04***
Student	0	0.0E+00	0	0.0E+00	0.0E+00	1.1E+00	5.0E+00	***0.0E+00***	***0.0E+00***

1. Annual Avarage Exposure Concentration (ug/m^3) = Max. Annual Emission Rate (g/sec) * Max. Annual Avg. Chi/Q (ug/m^3 per g/sec)
2. Inhalation Dose (mg/kg-day) = Ann. Avg. Exp. Conc. (ug/m^3) * BR (L/kg-day) * UCF (mg-m^3)/(ug/L) * EAF$_{(cancer\ risk)}$
3. Max. Cancer Risk = Inhalation Dose (mg/kg-day) * CPF (mg/kg-day)$^{-1}$
4. Max. Non-cancer Hazerd Quotient = Ann. Avg. Exp. Conc. (ug/m^3) * EAF$_{(non\text{-}cancer)}$ / REL (ug/m^3)

Exposure Adjustment Factors (EAFs) for Sources that Operate Intermittently:

	Daily (hours/day)	Weekly (days/week)	Annually (weeks/year)	Lifetime (years per 70-yr lifetime)	Exposure Adjustment Factors (EAFs)[5] (cancer risk)	Exposure Adjustment Factors (EAFs)[5] (non-cancer hazard quotient)
Resident is Present While Source is Operating	24	7	50	70		
Worker is Present While Source is Operating	8	5	49	40		
Student is Present While Source is Operating	10	5	36	9		
Source is Operating	1	1	50	70		
Fraction of Time **Resident** is Present While the Source is Operating	1.00	1.00	1.00	1.00	1.00	1.00
Fraction of Time **Worker** is Present While the Source is Operating	1.00	1.00	0.98	0.57	0.56	0.98
Fraction of Time **Student** is Present While the Source is Operating	1.00	1.00	0.72	0.13	0.09	0.72

5. Note that the fraction of time that a receptor is present while a source is operating can not exceed one.
Thus, if a receptor is present 10 hours/day, but the source operates only 8 hours/day, the maximum that the receptor can be present while the source is operating is the number of hours the source is operating (e.g., 8 hours).

Exposure Parameters:

Receptor	Breathing Rate (BR)[6] (L/kg-day)	Exposure Time (ET) (hours/day)	Exposure Frequency (EF) (day/year)	Exposure Duration (ED) (years)	Units Conversion Factor (UCF) (mg-m^3)/(ug/L)	Averaging Time (AT - 70 years) (days)
Resident	302	24	350	70	1.0E-06	25,550
Worker	447	8	245	40	1.0E-06	25,550
Student	581	10	180	9	1.0E-06	25,550

6. Based on a 24-hour day. Worker breathing rate is 149 L/kg-day (for an 8-hour workday), and 447 L/kg-day (for a 24-hour day).

Health Risk Screening Analysis Summary for Standby Generator Diesel Engine
Facility =Eastshore Energy Center, (Hayward, CA)

- **Plant #18041; Application #15195** MAX PT
- **ISC Air Dispersion Model Used**
- **Union City Meteorological Data Used**
- **Hayward Terrain Data Used**
- **Daytime Scalars Used**
- **Urban Land Use**

Health Risk Estimates:

Receptor	Max. Annual Emission Rate		Max. Annual Avg. Chi/Q	Annual Average Exposure Concentration[1]	Inhalation Dose[2]	Diesel PM: Inhalation Cancer Potency Factor (CPF)	Diesel PM: Inhalation Reference Exposure Level (REL)	***Max. Cancer Risk[3]***	***Max. Non-cancer Hazard Quotient[4]***
	(lb/yr)	(g/sec)	(ug/m^3 per g/sec)	(ug/m^3)	(mg/kg-day)	$(mg/kg\text{-}day)^{-1}$	(ug/m^3)		
Resident	4.5434	6.5E-05	5.2E-01	0.00003	1.0E-08	1.1E+00	5.0E+00	***1.13E-08***	***6.8E-06***
Worker	4.5434	6.5E-05	3.5E+01	0.00229	5.7E-07	1.1E+00	5.0E+00	***6.30E-07***	***4.5E-04***
Student	0	0.0E+00	0	0.0E+00	0.0E+00	1.1E+00	5.0E+00	***0.0E+00***	***0.0E+00***

1. Annual Average Exposure Concentration (ug/m^3) = Max. Annual Emission Rate (g/sec) * Max. Annual Avg. Chi/Q (ug/m^3 per g/sec)
2. Inhalation Dose (mg/kg-day) = Ann. Avg. Exp. Conc. (ug/m^3) * BR (L/kg-day) * UCF ($mg\text{-}m^3$)/(ug/L) * $EAF_{(cancer\ risk)}$
3. Max. Cancer Risk = Inhalation Dose (mg/kg-day) * CPF $(mg/kg\text{-}day)^{-1}$
4. Max. Non-cancar Hazard Quotient = Ann. Avg. Exp. Conc. (ug/m^3) * $EAF_{(non\text{-}cancer)}$ / REL (ug/m^3)

Exposure Adjustment Factors (EAFs) for Sources that Operate Intermittently:

	Daily (hours/day)	Weekly (days/week)	Annually (weeks/year)	Lifetime (years per 70-yr lifetime)	Exposure Adjustment Factors (EAFs)[5]	
Resident is Present While Source is Operating	24	7	50	70		
Worker is Present While Source is Operating	8	5	49	40		
Student is Present While Source is Operating	10	5	36	9	(cancer risk)	(non-cancer hazard quotient)
Source is Operating	1	1	50	70		
Fraction of Time **Resident** is Present While the Source is Operating	1.00	1.00	1.00	1.00	1.00	1.00
Fraction of Time **Worker** is Present While the Source is Operating	1.00	1.00	0.98	0.57	0.56	0.98
Fraction of Time **Student** is Present While the Source is Operating	1.00	1.00	0.72	0.13	0.09	0.72

5. Note that the fraction of time that a receptor is present while a source is operating can not exceed one.
Thus, if a receptor is present 10 hours/day, but the source operates only 8 hours/day, the maximum that the receptor can be present while the source is operating is the number of hours the source is operating (e.g., 8 hours).

Exposure Parameters:

Receptor	Breathing Rate (BR)[6] (L/kg-day)	Exposure Time (ET) (hours/day)	Exposure Frequency (EF) (day/year)	Exposure Duration (ED) (years)	Units Conversion Factor (UCF) $(mg\text{-}m^3)/(ug/L)$	Averaging Time (AT - 70 years) (days)
Resident	302	24	350	70	1.0E-06	25,550
Worker	447	8	245	40	1.0E-06	25,550
Student	581	10	180	9	1.0E-06	25,550

6. Based on a 24-hour day. Worker breathing rate is 149 L/kg-day (for an 8-hour workday), and 447 L/kg-day (for a 24-hour day).

```
NO ECHO

 BEE-Line ISCST3 "BEEST" Version 9.00

 Input File - C:\IRMA\BEEST\DCModel\EECenter(unitless)gradualplumerise_90_DIESEL.DTA

Output File - C:\IRMA\BEEST\DCModel\EECenter(unitless)gradualplumerise_90_DIESEL.LST

   Met File - C:\metdata\UnionCity\metdata00-04600.asc


 *** Message Summary For ISC3 Model Setup ***

 --------- Summary of Total Messages --------

A Total of            0 Fatal Error Message(s)
A Total of            1 Warning Message(s)
A Total of            0 Informational Message(s)


   ******** FATAL ERROR MESSAGES ********
              ***  NONE  ***


   ********   WARNING MESSAGES   ********
RE W282  2397 CHK_EL:RecElev < SrcBase; See non-DFAULT HE>ZI option in  MCB#9

***********************************
*** SETUP Finishes Successfully ***
***********************************


 *** ISCST3 - VERSION 02035 ***     *** Eastshore Energy LLC                                                    ***        01/25/07
                                     ***                                                                         ***        16:44:31
**MODELOPTs:                                                                                                              PAGE   1
CONC                    URBAN ELEV                GRDRIS

                                        ***     MODEL SETUP OPTIONS SUMMARY       ***
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

**Intermediate Terrain Processing is Selected

**Model Is Setup For Calculation of Average CONCentration Values.

  --  SCAVENGING/DEPOSITION LOGIC --
**Model Uses NO DRY DEPLETION.  DDPLETE =  F
**Model Uses NO WET DEPLETION.  WDPLETE =  F
**NO WET SCAVENGING Data Provided.
```

```
**NO GAS DRY DEPOSITION Data Provided.
**Model Does NOT Use GRIDDED TERRAIN Data for Depletion Calculations

**Model Uses URBAN Dispersion.

**Model Uses User-Specified Options:
          1. Gradual Plume Rise.
          2. Stack-tip Downwash.
          3. Buoyancy-induced Dispersion.
          4. Calms Processing Routine.
          5. Not Use Missing Data Processing Routine.
          6. User-Specified Wind Profile Exponents.
          7. Default Vertical Potential Temperature Gradients.

**Model Accepts Receptors on ELEV Terrain.

**Model Assumes No FLAGPOLE Receptor Heights.

**Model Calculates  1 Short Term Average(s) of:   1-HR
    and Calculates PERIOD Averages

**This Run Includes:     1 Source(s);      4 Source Group(s); and    2357 Receptor(s)

**The Model Assumes A Pollutant Type of:  DIESEL

**Model Set To Continue RUNning After the Setup Testing.

**Output Options Selected:
        Model Outputs Tables of PERIOD Averages by Receptor
        Model Outputs Tables of Highest Short Term Values by Receptor (RECTABLE Keyword)
        Model Outputs External File(s) of High Values for Plotting (PLOTFILE Keyword)

**NOTE:  The Following Flags May Appear Following CONC Values:  c for Calm Hours
                                                                m for Missing Hours
                                                                b for Both Calm and Missing Hours

**Misc. Inputs:  Anem. Hgt. (m) =    20.00 ;    Decay Coef. =    0.000     ;    Rot. Angle =     0.0
                 Emission Units = GRAMS/SEC                                ;  Emission Rate Unit Factor =   0.10000E+07
                 Output Units   = MICROGRAMS/M**3

**Approximate Storage Requirements of Model =     1.4 MB of RAM.

**Input Runstream File:          EECenter(unitless)gradualplumerise_90_DIESEL.DTA
**Output Print File:             EECenter(unitless)gradualplumerise_90_DIESEL.LST

 *** ISCST3 - VERSION 02035 ***    *** Eastshore Energy LLC                                          ***        01/25/07
                                   ***                                                               ***        16:44:31
**MODELOPTs:                                                                                                   PAGE   2
CONC                   URBAN ELEV                GRDRIS
```

*** POINT SOURCE DATA ***

SOURCE ID	NUMBER PART. CATS.	EMISSION RATE (GRAMS/SEC)	X (METERS)	Y (METERS)	BASE ELEV. (METERS)	STACK HEIGHT (METERS)	STACK TEMP. (DEG.K)	STACK EXIT VEL. (M/SEC)	STACK DIAMETER (METERS)	BUILDING EXISTS	EMISSION RATE SCALAR VARY BY
15	0	0.10000E+01	577581.7	4165776.2	7.0	10.00	735.15	41.47	0.18	YES	

*** SOURCE IDs DEFINING SOURCE GROUPS ***

GROUP ID	SOURCE IDs
ALL	15 ,
SA11	15 ,
S15	15 ,
15	15 ,

*** DIRECTION SPECIFIC BUILDING DIMENSIONS ***

SOURCE ID: 15

IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK
1	9.0,	129.5,	0	2	9.0,	126.6,	0	3	9.0,	119.7,	0	4	9.0,	109.3,	0	5	9.0,	95.5,	0	6	9.0,	78.8,	0
7	9.0,	59.7,	0	8	9.0,	38.8,	0	9	6.7,	38.8,	0	10	9.0,	40.8,	0	11	9.0,	60.0,	0	12	9.0,	79.0,	0
13	9.0,	95.7,	0	14	9.0,	109.4,	0	15	13.3,	56.3,	0	16	13.3,	54.1,	0	17	13.3,	50.2,	0	18	13.3,	47.6,	0
19	13.3,	50.0,	0	20	13.3,	52.8,	0	21	9.0,	119.7,	0	22	9.0,	109.3,	0	23	9.0,	95.5,	0	24	9.0,	78.8,	0
25	9.0,	59.7,	0	26	9.0,	38.8,	0	27	6.7,	38.8,	0	28	9.0,	40.8,	0	29	9.0,	60.0,	0	30	9.0,	79.0,	0
31	9.0,	95.7,	0	32	9.0,	109.4,	0	33	9.0,	119.8,	0	34	9.0,	126.6,	0	35	9.0,	129.6,	0	36	9.0,	128.6,	0

**MODELOPTs:
CONC URBAN ELEV GRDRIS

*** DISCRETE CARTESIAN RECEPTORS ***
(X-COORD, Y-COORD, ZELEV, ZFLAG)
(METERS)

(	577932.8,	4166528.2,	8.6, 0.0);	(	577932.8,	4166499.8,	9.1, 0.0);
(	577936.3,	4166457.2,	9.1, 0.0);	(	577936.3,	4166421.8,	8.8, 0.0);
(	577939.9,	4166389.8,	8.8, 0.0);	(	577939.9,	4166361.5,	8.8, 0.0);
(	577954.1,	4166347.2,	8.8, 0.0);	(	577982.5,	4166347.2,	8.8, 0.0);
(	578003.8,	4166347.2,	8.9, 0.0);	(	578032.2,	4166347.2,	9.1, 0.0);
(	578071.2,	4166347.2,	9.2, 0.0);	(	578096.1,	4166343.8,	9.4, 0.0);
(	577993.1,	4166340.0,	8.8, 0.0);	(	577964.8,	4166340.0,	8.8, 0.0);
(	577943.4,	4166386.2,	8.8, 0.0);	(	577947.0,	4166428.8,	8.8, 0.0);
(	577939.9,	4166478.5,	9.1, 0.0);	(	577939.9,	4166507.0,	9.1, 0.0);
(	577477.6,	4165819.0,	6.3, 0.0);	(	577479.0,	4165819.0,	6.4, 0.0);
(	577488.7,	4165818.8,	6.4, 0.0);	(	577498.4,	4165818.5,	6.4, 0.0);
(	577508.1,	4165818.0,	6.4, 0.0);	(	577517.8,	4165817.8,	6.4, 0.0);
(	577527.5,	4165817.5,	6.6, 0.0);	(	577537.1,	4165817.0,	6.7, 0.0);
(	577546.8,	4165816.8,	6.7, 0.0);	(	577556.5,	4165816.5,	6.7, 0.0);
(	577566.2,	4165816.0,	6.7, 0.0);	(	577575.9,	4165815.8,	6.9, 0.0);
(	577585.6,	4165815.5,	7.0, 0.0);	(	577595.3,	4165815.0,	7.0, 0.0);
(	577605.0,	4165814.8,	7.0, 0.0);	(	577614.7,	4165814.5,	7.2, 0.0);
(	577624.4,	4165814.2,	7.3, 0.0);	(	577634.0,	4165814.0,	7.3, 0.0);
(	577643.7,	4165813.5,	7.3, 0.0);	(	577653.4,	4165813.2,	7.3, 0.0);
(	577663.1,	4165813.0,	7.4, 0.0);	(	577672.8,	4165812.5,	7.6, 0.0);
(	577682.5,	4165812.2,	7.6, 0.0);	(	577691.6,	4165809.0,	7.6, 0.0);
(	577700.7,	4165805.5,	7.6, 0.0);	(	577709.7,	4165802.2,	7.9, 0.0);
(	577718.8,	4165799.0,	7.9, 0.0);	(	577726.2,	4165793.5,	7.9, 0.0);
(	577733.6,	4165788.2,	7.9, 0.0);	(	577741.0,	4165782.8,	7.9, 0.0);
(	577748.4,	4165777.5,	7.9, 0.0);	(	577755.8,	4165772.0,	8.1, 0.0);
(	577755.9,	4165762.5,	8.2, 0.0);	(	577756.0,	4165753.2,	8.2, 0.0);
(	577756.2,	4165743.8,	8.2, 0.0);	(	577756.3,	4165734.5,	8.2, 0.0);
(	577756.4,	4165725.0,	8.2, 0.0);	(	577756.4,	4165718.2,	8.2, 0.0);
(	577746.8,	4165718.2,	8.2, 0.0);	(	577737.1,	4165718.5,	8.1, 0.0);
(	577727.5,	4165718.5,	7.9, 0.0);	(	577717.8,	4165718.5,	7.9, 0.0);
(	577708.1,	4165718.8,	7.9, 0.0);	(	577698.5,	4165718.8,	7.7, 0.0);
(	577688.8,	4165719.0,	7.6, 0.0);	(	577679.2,	4165719.0,	7.6, 0.0);
(	577669.5,	4165719.0,	7.6, 0.0);	(	577659.8,	4165719.2,	7.3, 0.0);
(	577650.2,	4165719.2,	7.3, 0.0);	(	577640.5,	4165719.5,	7.3, 0.0);
(	577630.9,	4165719.5,	7.3, 0.0);	(	577621.2,	4165719.5,	7.0, 0.0);
(	577611.5,	4165719.8,	7.0, 0.0);	(	577601.9,	4165719.8,	7.0, 0.0);
(	577592.2,	4165720.0,	7.0, 0.0);	(	577582.6,	4165720.0,	6.8, 0.0);
(	577572.9,	4165720.0,	6.7, 0.0);	(	577563.2,	4165720.0,	6.7, 0.0);

(577553.6,	4165720.2,	6.5,	0.0);	(577543.9,	4165720.2,	6.4,	0.0);
(577534.3,	4165720.5,	6.4,	0.0);	(577524.6,	4165720.5,	6.2,	0.0);
(577514.9,	4165720.5,	6.1,	0.0);	(577505.3,	4165720.8,	6.1,	0.0);
(577495.6,	4165720.8,	6.1,	0.0);	(577486.0,	4165721.0,	6.1,	0.0);
(577476.3,	4165721.0,	6.0,	0.0);	(577476.4,	4165730.8,	6.1,	0.0);
(577476.6,	4165740.5,	6.1,	0.0);	(577476.7,	4165750.5,	6.1,	0.0);
(577476.8,	4165760.2,	6.1,	0.0);	(577477.0,	4165770.0,	6.1,	0.0);

**MODELOPTs:
CONC URBAN ELEV GRDRIS

*** METEOROLOGICAL DAYS SELECTED FOR PROCESSING ***
(1=YES; 0=NO)

```
1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1
```

NOTE: METEOROLOGICAL DATA ACTUALLY PROCESSED WILL ALSO DEPEND ON WHAT IS INCLUDED IN THE DATA FILE.

*** UPPER BOUND OF FIRST THROUGH FIFTH WIND SPEED CATEGORIES ***
(METERS/SEC)

1.54, 3.09, 5.14, 8.23, 10.80,

*** WIND PROFILE EXPONENTS ***

STABILITY	WIND SPEED CATEGORY					
CATEGORY	1	2	3	4	5	6
A	.70000E-01	.70000E-01	.70000E-01	.70000E-01	.70000E-01	.70000E-01
B	.70000E-01	.70000E-01	.70000E-01	.70000E-01	.70000E-01	.70000E-01
C	.10000E+00	.10000E+00	.10000E+00	.10000E+00	.10000E+00	.10000E+00
D	.15000E+00	.15000E+00	.15000E+00	.15000E+00	.15000E+00	.15000E+00
E	.35000E+00	.35000E+00	.35000E+00	.35000E+00	.35000E+00	.35000E+00
F	.55000E+00	.55000E+00	.55000E+00	.55000E+00	.55000E+00	.55000E+00

*** VERTICAL POTENTIAL TEMPERATURE GRADIENTS ***
(DEGREES KELVIN PER METER)

STABILITY CATEGORY	WIND SPEED CATEGORY 1	2	3	4	5	6
A	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
B	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
C	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
D	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
E	.20000E-01	.20000E-01	.20000E-01	.20000E-01	.20000E-01	.20000E-01
F	.35000E-01	.35000E-01	.35000E-01	.35000E-01	.35000E-01	.35000E-01

**MODELOPTs:
CONC URBAN ELEV GRDRIS

*** THE FIRST 24 HOURS OF METEOROLOGICAL DATA ***

FILE: metdata00-04600.asc
FORMAT: (4I2,2F9.4,F6.1,I2,2F7.1,f9.4,f10.1,f8.4,i4,f7.2)
SURFACE STATION NO.: 1901 UPPER AIR STATION NO.: 1901
NAME: UNKNOWN NAME: UNKNOWN
YEAR: 1990 YEAR: 1990

YR	MN	DY	HR	FLOW VECTOR	SPEED (M/S)	TEMP (K)	STAB CLASS	MIXING HEIGHT (M) RURAL	MIXING HEIGHT (M) URBAN	USTAR (M/S)	M-O LENGTH (M)	Z-0 (M)	IPCODE	PRATE (mm/HR)
90	01	01	01	342.0	2.15	283.0	4	600.0	600.0	0.0000	0.0	0.0000	0	0.00
90	01	01	02	303.0	1.00	283.0	5	600.0	600.0	0.0000	0.0	0.0000	0	0.00
90	01	01	03	267.0	1.07	283.0	6	600.0	600.0	0.0000	0.0	0.0000	0	0.00
90	01	01	04	288.0	1.00	282.8	6	600.0	600.0	0.0000	0.0	0.0000	0	0.00
90	01	01	05	296.0	1.00	282.4	5	600.0	600.0	0.0000	0.0	0.0000	0	0.00
90	01	01	06	312.0	1.70	282.0	5	600.0	600.0	0.0000	0.0	0.0000	0	0.00
90	01	01	07	326.0	2.19	281.8	6	600.0	600.0	0.0000	0.0	0.0000	0	0.00
90	01	01	08	314.0	2.59	281.5	5	600.0	600.0	0.0000	0.0	0.0000	0	0.00
90	01	01	09	304.0	2.10	281.9	4	600.0	600.0	0.0000	0.0	0.0000	0	0.00
90	01	01	10	303.0	2.15	282.9	3	600.0	600.0	0.0000	0.0	0.0000	0	0.00
90	01	01	11	333.0	2.32	284.1	3	600.0	600.0	0.0000	0.0	0.0000	0	0.00
90	01	01	12	339.0	3.31	284.5	4	600.0	600.0	0.0000	0.0	0.0000	0	0.00
90	01	01	13	345.0	2.24	284.1	3	600.0	600.0	0.0000	0.0	0.0000	0	0.00
90	01	01	14	335.0	2.82	283.5	3	600.0	600.0	0.0000	0.0	0.0000	0	0.00
90	01	01	15	341.0	2.68	283.1	2	600.0	600.0	0.0000	0.0	0.0000	0	0.00
90	01	01	16	360.0	2.01	283.4	1	600.0	600.0	0.0000	0.0	0.0000	0	0.00
90	01	01	17	64.0	1.00	282.8	2	600.0	600.0	0.0000	0.0	0.0000	0	0.00
90	01	01	18	36.0	1.16	282.5	3	600.0	600.0	0.0000	0.0	0.0000	0	0.00
90	01	01	19	106.0	1.97	282.5	4	600.0	600.0	0.0000	0.0	0.0000	0	0.00
90	01	01	20	69.0	1.00	282.5	5	600.0	600.0	0.0000	0.0	0.0000	0	0.00
90	01	01	21	112.0	2.50	281.9	5	600.0	600.0	0.0000	0.0	0.0000	0	0.00
90	01	01	22	131.0	1.83	281.0	4	600.0	600.0	0.0000	0.0	0.0000	0	0.00

```
90 01 01 23  151.0   2.46  280.8   5     600.0   600.0    0.0000       0.0  0.0000   0   0.00
90 01 01 24  227.0   1.74  280.0   5     600.0   600.0    0.0000       0.0  0.0000   0   0.00


*** NOTES:  STABILITY CLASS 1=A, 2=B, 3=C, 4=D, 5=E AND 6=F.
            FLOW VECTOR IS DIRECTION TOWARD WHICH WIND IS BLOWING.
```


CONC URBAN ELEV GRDRIS

*** THE PERIOD (43824 HRS) AVERAGE CONCENTRATION VALUES FOR SOURCE GROUP: ALL ***
INCLUDING SOURCE(S): 15 ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF DIESEL IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC		X-COORD (M)	Y-COORD (M)	CONC	
577932.75	4166528.25	0.38215		577932.75	4166499.75	0.40169	
577936.31	4166457.25	0.42844		577936.31	4166421.75	0.45316	
577939.88	4166389.75	0.47886		577939.88	4166361.50	0.50581	
577954.06	4166347.25	0.51610		577982.50	4166347.25	0.50824	
578003.81	4166347.25	0.50367		578032.19	4166347.25	0.49782	
578071.25	4166347.25	0.48648		578096.12	4166343.75	0.48157	
577993.12	4166340.00	0.51356		577964.75	4166340.00	0.52100	RES
577943.44	4166386.25	0.48074		577947.00	4166428.75	0.44355	
577939.88	4166478.50	0.41246		577939.88	4166507.00	0.39440	
577477.62	4165819.00	3.09072		577479.00	4165819.00	3.15002	
577488.69	4165818.75	3.36975		577498.38	4165818.50	3.61986	
577508.12	4165818.00	3.88387		577517.81	4165817.75	4.26888	
577527.50	4165817.50	5.65753		577537.12	4165817.00	7.69417	
577546.81	4165816.75	10.55177		577556.50	4165816.50	13.77655	
577566.19	4165816.00	14.55918		577575.88	4165815.75	11.86849	
577585.62	4165815.50	8.58663		577595.31	4165815.00	7.40701	
577605.00	4165814.75	7.86360		577614.69	4165814.50	9.25977	
577624.38	4165814.25	10.25516		577634.00	4165814.00	10.67657	
577643.69	4165813.50	10.89088		577653.38	4165813.25	11.21649	
577663.12	4165813.00	11.63138		577672.81	4165812.50	11.93098	
577682.50	4165812.25	11.78340		577691.62	4165809.00	12.47078	
577700.69	4165805.50	13.03301		577709.69	4165802.25	13.42173	
577718.81	4165799.00	13.45791		577726.19	4165793.50	14.10096	
577733.62	4165788.25	14.44005		577741.00	4165782.75	14.62820	
577748.38	4165777.50	14.57869		577755.81	4165772.00	14.47177	
577755.88	4165762.50	15.78101		577756.00	4165753.25	16.74888	
577756.19	4165743.75	17.38327		577756.31	4165734.50	17.63976	
577756.38	4165725.00	17.54350	IND (CUM)	577756.38	4165718.25	17.27776	
577746.81	4165718.25	18.73650		577737.12	4165718.50	20.36184	

577727.50	4165718.50	22.07144	577717.81	4165718.50	24.04777	
577708.12	4165718.75	26.23095	577698.50	4165718.75	28.28960	
577688.81	4165719.00	30.50341	577679.19	4165719.00	32.57171	
577669.50	4165719.00	34.30567	577659.81	4165719.25	35.02845	IND
577650.19	4165719.25	35.02361	577640.50	4165719.50	33.81364	
577630.88	4165719.50	31.07071	577621.19	4165719.50	27.82691	
577611.50	4165719.75	25.78679	577601.88	4165719.75	22.43861	
577592.19	4165720.00	18.43530	577582.62	4165720.00	13.24175	
577572.88	4165720.00	8.24627	577563.19	4165720.00	4.75374	
577553.62	4165720.25	2.56764	577543.88	4165720.25	1.50911	
577534.31	4165720.50	1.05879	577524.62	4165720.50	0.85775	

**MODELOPTs:
CONC URBAN ELEV GRDRIS

*** THE SUMMARY OF MAXIMUM PERIOD (43824 HRS) RESULTS ***

** CONC OF DIESEL IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZFLAG)				OF TYPE	NETWORK GRID-ID
ALL	1ST HIGHEST VALUE IS	35.02845 AT	577659.81,	4165719.25,	7.30,	0.00)	DC	NA
	2ND HIGHEST VALUE IS	35.02361 AT	577650.19,	4165719.25,	7.30,	0.00)	DC	NA
	3RD HIGHEST VALUE IS	34.30567 AT	577669.50,	4165719.00,	7.60,	0.00)	DC	NA
	4TH HIGHEST VALUE IS	33.81364 AT	577640.50,	4165719.50,	7.30,	0.00)	DC	NA
	5TH HIGHEST VALUE IS	32.57171 AT	577679.19,	4165719.00,	7.60,	0.00)	DC	NA
	6TH HIGHEST VALUE IS	31.07071 AT	577630.88,	4165719.50,	7.30,	0.00)	DC	NA
	7TH HIGHEST VALUE IS	30.50341 AT	577688.81,	4165719.00,	7.60,	0.00)	DC	NA
	8TH HIGHEST VALUE IS	29.12955 AT	577670.00,	4165710.00,	7.60,	0.00)	DC	NA
	9TH HIGHEST VALUE IS	29.09073 AT	577660.00,	4165710.00,	7.30,	0.00)	DC	NA
	10TH HIGHEST VALUE IS	28.58663 AT	577650.00,	4165710.00,	7.30,	0.00)	DC	NA
SA11	1ST HIGHEST VALUE IS	35.02845 AT	577659.81,	4165719.25,	7.30,	0.00)	DC	NA
	2ND HIGHEST VALUE IS	35.02361 AT	577650.19,	4165719.25,	7.30,	0.00)	DC	NA
	3RD HIGHEST VALUE IS	34.30567 AT	577669.50,	4165719.00,	7.60,	0.00)	DC	NA
	4TH HIGHEST VALUE IS	33.81364 AT	577640.50,	4165719.50,	7.30,	0.00)	DC	NA
	5TH HIGHEST VALUE IS	32.57171 AT	577679.19,	4165719.00,	7.60,	0.00)	DC	NA
	6TH HIGHEST VALUE IS	31.07071 AT	577630.88,	4165719.50,	7.30,	0.00)	DC	NA
	7TH HIGHEST VALUE IS	30.50341 AT	577688.81,	4165719.00,	7.60,	0.00)	DC	NA
	8TH HIGHEST VALUE IS	29.12955 AT	577670.00,	4165710.00,	7.60,	0.00)	DC	NA
	9TH HIGHEST VALUE IS	29.09073 AT	577660.00,	4165710.00,	7.30,	0.00)	DC	NA
	10TH HIGHEST VALUE IS	28.58663 AT	577650.00,	4165710.00,	7.30,	0.00)	DC	NA
S15	1ST HIGHEST VALUE IS	35.02845 AT	577659.81,	4165719.25,	7.30,	0.00)	DC	NA
	2ND HIGHEST VALUE IS	35.02361 AT	577650.19,	4165719.25,	7.30,	0.00)	DC	NA
	3RD HIGHEST VALUE IS	34.30567 AT	577669.50,	4165719.00,	7.60,	0.00)	DC	NA

4TH HIGHEST VALUE IS	33.81364 AT (	577640.50,	4165719.50,	7.30,	0.00)	DC	NA	
5TH HIGHEST VALUE IS	32.57171 AT (	577679.19,	4165719.00,	7.60,	0.00)	DC	NA	
6TH HIGHEST VALUE IS	31.07071 AT (	577630.88,	4165719.50,	7.30,	0.00)	DC	NA	
7TH HIGHEST VALUE IS	30.50341 AT (	577688.81,	4165719.00,	7.60,	0.00)	DC	NA	
8TH HIGHEST VALUE IS	29.12955 AT (	577670.00,	4165710.00,	7.60,	0.00)	DC	NA	
9TH HIGHEST VALUE IS	29.09073 AT (	577660.00,	4165710.00,	7.30,	0.00)	DC	NA	
10TH HIGHEST VALUE IS	28.58663 AT (	577650.00,	4165710.00,	7.30,	0.00)	DC	NA	

*** THE SUMMARY OF MAXIMUM PERIOD (43824 HRS) RESULTS ***

** CONC OF DIESEL IN MICROGRAMS/M**3 **

GROUP ID	AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZFLAG)		OF TYPE	NETWORK GRID-ID
15 1ST HIGHEST VALUE IS	35.02845 AT (	577659.81,	4165719.25, 7.30, 0.00)	DC	NA
2ND HIGHEST VALUE IS	35.02361 AT (	577650.19,	4165719.25, 7.30, 0.00)	DC	NA
3RD HIGHEST VALUE IS	34.30567 AT (	577669.50,	4165719.00, 7.60, 0.00)	DC	NA
4TH HIGHEST VALUE IS	33.81364 AT (	577640.50,	4165719.50, 7.30, 0.00)	DC	NA
5TH HIGHEST VALUE IS	32.57171 AT (	577679.19,	4165719.00, 7.60, 0.00)	DC	NA
6TH HIGHEST VALUE IS	31.07071 AT (	577630.88,	4165719.50, 7.30, 0.00)	DC	NA
7TH HIGHEST VALUE IS	30.50341 AT (	577688.81,	4165719.00, 7.60, 0.00)	DC	NA
8TH HIGHEST VALUE IS	29.12955 AT (	577670.00,	4165710.00, 7.60, 0.00)	DC	NA
9TH HIGHEST VALUE IS	29.09073 AT (	577660.00,	4165710.00, 7.30, 0.00)	DC	NA
10TH HIGHEST VALUE IS	28.58663 AT (	577650.00,	4165710.00, 7.30, 0.00)	DC	NA

*** RECEPTOR TYPES: GC = GRIDCART
GP = GRIDPOLR
DC = DISCCART
DP = DISCPOLR
BD = BOUNDARY

*** THE SUMMARY OF HIGHEST 1-HR RESULTS ***

** CONC OF DIESEL IN MICROGRAMS/M**3 **

DATE NETWORK

GROUP ID		AVERAGE CONC	(YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZFLAG)	OF TYPE	GRID-ID
ALL	HIGH 1ST HIGH VALUE IS	979.23785	ON 91040703: AT (	577592.19, 4165720.00, 7.00, 0.00)	DC	NA
SA11	HIGH 1ST HIGH VALUE IS	979.23785	ON 91040703: AT (	577592.19, 4165720.00, 7.00, 0.00)	DC	NA
S15	HIGH 1ST HIGH VALUE IS	979.23785	ON 91040703: AT (	577592.19, 4165720.00, 7.00, 0.00)	DC	NA
15	HIGH 1ST HIGH VALUE IS	979.23785	ON 91040703: AT (	577592.19, 4165720.00, 7.00, 0.00)	DC	NA

*** RECEPTOR TYPES: GC = GRIDCART
GP = GRIDPOLR
DC = DISCCART
DP = DISCPOLR
BD = BOUNDARY

**MODELOPTs:
CONC URBAN ELEV GRDRIS

*** Message Summary : ISCST3 Model Execution ***

--------- Summary of Total Messages --------

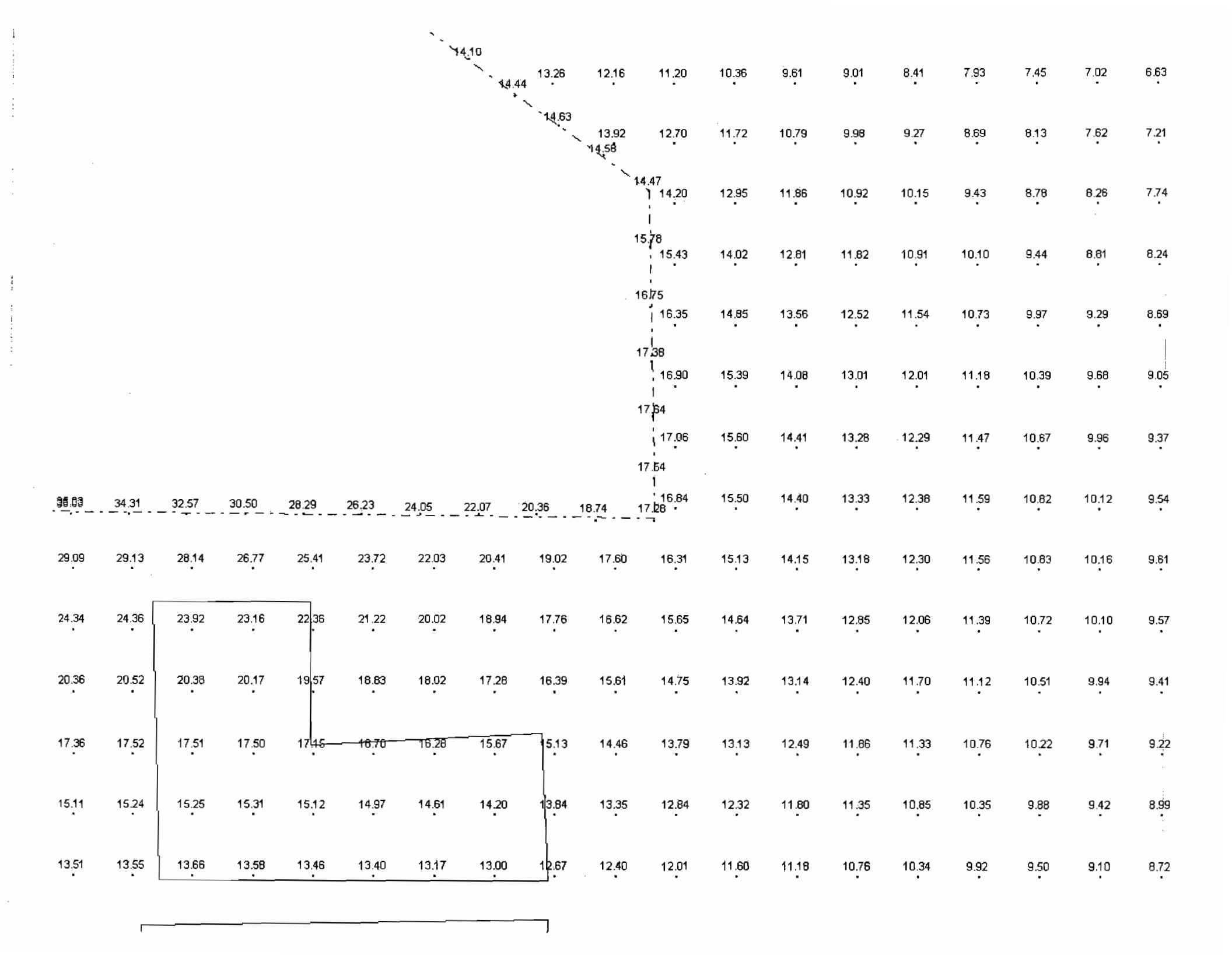
A Total of 0 Fatal Error Message(s)
A Total of 1 Warning Message(s)
A Total of 133 Informational Message(s)

A Total of 133 Calm Hours Identified

******** FATAL ERROR MESSAGES ********
*** NONE ***

******** WARNING MESSAGES ********
RE W282 2397 CHK_EL:RecElev < SrcBase; See non-DFAULT HE>ZI option in MCB#9

****
*** ISCST3 Finishes Successfully ***
****


14.10 13.26 12.16 11.20 10.36 9.61 9.01 8.41 7.93 7.45 7.02 6.63
14.44 13.92 12.70 11.72 10.79 9.98 9.27 8.69 8.13 7.62 7.21
14.63 14.58 14.47 14.20 12.95 11.86 10.92 10.15 9.43 8.78 8.26 7.74
15.78 15.43 14.02 12.81 11.82 10.91 10.10 9.44 8.81 8.24
16.75 16.35 14.85 13.56 12.52 11.54 10.73 9.97 9.29 8.69
17.38 16.90 15.39 14.08 13.01 12.01 11.18 10.39 9.68 9.05
17.64 17.06 15.60 14.41 13.28 12.29 11.47 10.67 9.96 9.37
17.54 16.84 15.50 14.40 13.33 12.38 11.59 10.82 10.12 9.54
35.03 34.31 32.57 30.50 28.29 26.23 24.05 22.07 20.36 18.74 17.28
29.09 29.13 28.14 26.77 25.41 23.72 22.03 20.41 19.02 17.60 16.31 15.13 14.15 13.18 12.30 11.56 10.83 10.16 9.61
24.34 24.36 23.92 23.16 22.36 21.22 20.02 18.94 17.76 16.62 15.65 14.64 13.71 12.85 12.06 11.39 10.72 10.10 9.57
20.36 20.52 20.38 20.17 19.57 18.83 18.02 17.28 16.39 15.61 14.75 13.92 13.14 12.40 11.70 11.12 10.51 9.94 9.41
17.36 17.52 17.51 17.50 17.45 16.76 16.28 15.67 15.13 14.46 13.79 13.13 12.49 11.86 11.33 10.76 10.22 9.71 9.22
15.11 15.24 15.25 15.31 15.12 14.97 14.61 14.20 13.84 13.35 12.84 12.32 11.80 11.35 10.85 10.35 9.88 9.42 8.99
13.51 13.55 13.66 13.58 13.46 13.40 13.17 13.00 12.67 12.40 12.01 11.60 11.18 10.76 10.34 9.92 9.50 9.10 8.72

Irma Salinas

From: Brian Lusher
Sent: Thursday, March 15, 2007 8:48 AM
To: Irma Salinas
Subject: Final Air Toxics Inventory

Air Toxics Emissions Eastshore...

Annual Average Firing Rate 72.08 MMBtu/hr

Short Term Max Firing Rate 72.8 MMBtu/hr

Ammonia Slip Now 10 ppm

Diesel Engine 50 hours

Please Finalize the Health Risk Screening Analysis with this data.

Thanks,

Brian K Lusher
Air Quality Engineer II
Engineering Division
Bay Area Air Quality Management District

Phone (415) 749-4623
Fax (415) 749-5030

BEFORE THE ENERGY RESOURCES CONSERVATION AND DEVELOPMENT COMMISSION OF THE STATE OF CALIFORNIA

APPLICATION FOR CERTIFICATION FOR THE EASTSHORE ENERGY CENTER IN CITY OF HAYWARD BY TIERRA ENERGY

Docket No. 06-AFC-6

PROOF OF SERVICE
(Revised 10/12/2007)

INSTRUCTIONS: All parties shall either (1) send an original signed document plus 12 copies or (2) mail one original signed copy AND e-mail the document to the address for the Docket as shown below, AND (3) all parties shall also send a printed or electronic copy of the document, which includes a proof of service declaration to each of the individuals on the proof of service list shown below:

CALIFORNIA ENERGY COMMISSION
Attn: Docket No. 06-AFC-6
1516 Ninth Street, MS-4
Sacramento, CA 95814-5512
docket@energy.state.ca.us

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DECLARATION OF SERVICE

I, Maria Sergoyan, declare that on October 23, 2007, I deposited copies of the attached Final Determination of Compliance (FDOC) for the proposed Eastshore Energy Center (EEC) in the United States mail at Sacramento, California with first-class postage thereon fully prepaid and addressed to those identified on the Proof of Service list above.

OR

Transmission via electronic mail was consistent with the requirements of the California Code of Regulations, title 20, sections 1209, 1209.5, and 1210. All electronic copies were sent to all those identified on the Proof of Service list above.

I declare under penalty of perjury that the foregoing is true and correct.

Maria Sergoyan