Bay Area Air Quality Management District
Risk Screening Assessment, A# 6453
The City of Fairfield, P# 1606
March 6, 2003

This document describes the basis for the health risk screening assessment prepared for the City of Fairfield, 1000 Webster Street in Fairfield, California. This facility wishes to operate a natural gas fired internal combustion engine generator. In order to do this, the facility must get a permit from the Bay Area Air Quality Management District (BAAQMD). The BAAQMD, as a routine part of the evaluation of a permit application, prepared this screening risk assessment.

Acetaldehyde, acrolein, ammonia, benzene, 1,3-butadiene, carbon tetrachloride, chlorobenzene, chloroform, 1,1-Dichloroethane, 1,2-Dichloroethane, ethylbenzene, ethylene dibromide, formaldehyde, methanol, methylene chloride, naphthalene, polycyclic aromatic hydrocarbons, styrene, 1,1,2,2-tetrachloroethane, toluene 1,1,2-trichloroethane, vinyl chloride and xylene which are considered toxic air contaminants (TAC), will be emitted during the operation of the turbines. BAAQMD staff evaluates the possible impact of these TAC emissions that will occur during routine operation of the turbines. The TAC impact is expressed in terms of the increased risk of contracting cancer by individuals who live or work near the proposed turbines.

The estimated increase in each of the TAC emissions, in pounds per year, that can be expected from this source are summarized in the following table:

Toxic Air Contaminant	Annual Average Emissions, lb/yr
Acetaldehyde	185
Acrolein	56.7
Ammonia	983
Benzene	9.71
1,3 - Butadiene	5.89
Carbon tetrachloride	0.41
Chlorobenzene	0.34
Chloroform	0.32
1,1 - Dichloroethane	0.26
1,2 - Dichloroethane	0.26
Ethylbenzene	0.44
Ethylene dibromide	0.49
Formaldehyde	777
Methanol	55.2
Methylene chloride	0.44
Naphthalene	0.82
PAH's (all 6 as benzo[a]pyrene)	0.053
Styrene	0.26
1,1,2,2 - Tetrachloroethane	0.88
Toluene	9.01
1,1,2 - Trichloroethane	0.35
Vinyl chloride	0.16
Xylene	4.06

Ambient air concentrations of the TAC were predicted using the ISCST3 air dispersion computer model. This model uses information about the facility and the emission rates of toxic air contaminants to estimate what concentrations would be expected in the air at various locations around the site. The estimated concentrations of TAC are used to calculate the possible cancer and noncancer health risk that might be expected to arise from these exposures.

The potential cancer risk was calculated using standard risk assessment methodology. For residents, they include the assumptions that exposures are continuous for 24 hours per day, 7 days per week for 70-years. For students, the assumptions include higher breathing rates for children and that exposures are for 10 hours per day, 180 days per year over a 9-year period. The cancer risk is based on the "best estimates" of plausible cancer potencies as determined by the California Office of Environmental Health Hazard Assessment (OEHHA). The actual cancer risk, which cannot be determined, may approach zero. This type of analysis is considered to be health-protective.

The potential for noncancer health effects is evaluated by comparing the long-term exposure level to a Reference Exposure Level (REL). A REL is a concentration level at or below which no adverse health effects are anticipated. RELs are designed to protect sensitive individuals within the population. Comparisons to RELs are made by determining the hazard index, which is the ratio of the estimated exposure level to the REL.

The proposed operation would result in a maximum increased cancer risk of 5 chances in a million and a hazard index of 0.9 for nearby residences. For the students at We R Family School, the increased maximum cancer risk is 0.004 chances in a million and the hazard index is 0.003. For the students at Fairfield Montessori School, the increased maximum cancer risk is 0.006 chances in a million and the hazard index is 0.004. For the students at Community Day School, the increased maximum cancer risk is 0.006 chances in a million and the hazard index is 0.004. For the students at Fairfield Suisun Adult School, the increased maximum cancer risk is 0.006 chances in a million and the hazard index is 0.004. These health risk values, presented in the table below, meet the criteria for acceptable levels established in the BAAQMD's Risk Management Policy.

Health Risk Results		
Receptor	Maximum Increased Cancer Risk	Hazard Index
Residential	5 chances in a million	0.9
We R Family School	0.004 chances in a million	0.003
Fairfield Montessori School	0.006 chances in a million	0.004
Community Day School	0.006 chances in a million	0.004
Fairfield Suisun Adult School	0.006 chances in a million	0.004