

**Bay Area Air Quality Management District
Risk Screening Assessment, A#8338
County of Solano, P#1995
November 7, 2003**

This document describes the basis for the health risk screening assessment prepared for the County of Solano, located at 501 Delaware Street in Fairfield, California. This facility would like to operate a natural gas-fired electric engine. In order to do this, the facility must obtain 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, benzene, 1,3-butadiene, formaldehyde, and polycyclic aromatic hydrocarbons (PAHs), which are considered toxic air contaminants (TACs), will be emitted during the operation of the natural gas-fired engine. BAAQMD staff evaluated the possible impact of these TAC emissions that will occur during routine operation of the natural gas-fired electric engine. The TAC impact is expressed in terms of the increased risk of contracting cancer by individuals who live or work near the proposed natural gas-fired electric engine.

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
1,3-Butadiene	48.8
Acetaldehyde	205.3
Acrolein	193.5
Benzene	116.3
Formaldehyde	1,508.5
Benz(a)anthracene	0.021
Benzo(a)pyrene	0.0083
Benzo(b)fluoranthene	0.017
Benzo(k)fluoranthene	0.0074
Chrysene	0.022
Dibenz(a,h)anthracene	0.0009
Indeno(1,2,3-cd)pyrene	0.012

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

The potential cancer risks were calculated using standard risk assessment methodology. For residents, it was assumed that exposures would be continuous for 24 hours per day, 7 days per week for 70-years. For offsite workers, exposure was assumed to occur 8 hours per day, 240 days per year for 46 years. For students, exposure was assumed to occur 180 days per year over a 9-year period. Students were also assumed to have a higher breathing rate than residents. The cancer risk is based in part 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.

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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 of the natural gas fired electric engine would result in a maximum increased cancer risk of 2.2 chances in a million and a hazard index of 0.6 for offsite workers. For nearby residences, the increased maximum cancer risk is 0.48 chances in a million, and the hazard index is 0.08. For the students at Armijo High School, the increased maximum cancer risk is 0.0093 chances in a million and the hazard index is 0.03. 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	Increased Maximum Cancer Risk	Hazard Index
Residential	0.48 chances in a million	0.08
Occupational	2.2 chances in a million	0.6
Armijo High School	0.0093 chances in a million	0.03

School addresses: Armijo High School
 824 Washington Street
 Fairfield, CA