



Escon Tool & Manufacturing, Inc.

Location: During 1995, Escon was located at 201 Trade Street, San Marcos, CA 92069. In 1998, the facility relocated to 1375 Specialty Drive, Vista, CA 92083.

Facility Contact: Aubrey Vanderbyl

Facility Description: Manufacturing of electronic enclosures and precision sheet metal products.

Health Risk Assessment Summary

Year: 1995
Cancer Risk: 41 in a million
Chronic Index: 0.8
Acute Index: 3.12

Pollutants of Concern

Cancer Risk: Hexavalent chromium ([ARB compound summary](#), [EPA hazard summary](#))
Acute Non-cancer Risk: Nickel (endpoint = immune system)
([ARB compound summary](#), [EPA hazard summary](#))

Air Toxics
'Hot Spots'
Program

1995 Health Risk Assessment Summary for Escon Tool and Manufacturing, Inc. Facility

201 Trade Street, San Marcos, California

1.0 Executive Summary

This AB2588 Health Risk Assessment (HRA) summary has been prepared for the Escon Tool and Manufacturing, Inc. manufacturing facility located at 201 Trade Street, San Marcos, California (SDAPCD ID # 88172A). The HRA is based on the approved, updated 1995 emission inventory report. The information presented in the HRA shows that the health risks associated with the toxic emissions from the Escon facility present a potential health risk to the exposed population and, according to District guidelines, public notification is required.

The HRA has been prepared in accordance with the Air Toxics "Hot Spots" Information and Assessment Act of 1987 (AB 2588), utilizing the guidelines developed by the California Air Pollution Control Officers Association (CAPCOA) and the San Diego Air Pollution Control District (SDAPCD). These guidelines require the following five types of health risk evaluation:

1. Identification of the increased excess lifetime individual cancer risk due to exposure to chemicals being emitted by the facility;
2. Identification of the potential chronic health effects from exposure to airborne materials which do not cause cancer;
3. Identification of the potential acute health effects from brief (1-hour) exposures to maximum concentrations;
4. Identification of the location of maximum potential exposure for residents and offsite workers, and also the location of nearby sensitive receptor sites, such as daycare centers, schools, and nursing homes;
5. Identification of population excess cancer burden.

1.1 Technical Assessment

As shown in Figure 1, the Escon Tool and Manufacturing, Inc. facility (Escon) is located in the incorporated portion of the City of San Marcos on the south side of State Route 78 at the intersection of Trade and Enterprise Streets approximately 0.8 km (0.5 miles) east of intersection of Twin Oaks Valley Road and Route 78 and approximately 3 miles west of the intersection of Interstate 15 and Route 78. The facility is located in an industrial park and is directly north of the eastern end of the new California State University San Marcos Campus. It is bounded on all sides primarily by industrial and commercial facilities except that a single residence is located directly across Enterprise Street from Escon. The next nearest residential areas are approximately 0.2 km (0.16 miles) to the west and 0.45 km (0.3 miles) to the east.

The U.S. EPA's "Industrial Source Complex Short Term 3 Air Dispersion Model" (ISCST3; Version 97363) was used to estimate ambient air concentrations. These concentrations were then used to derive a conservative (i.e., health protective) estimate of: 1) the increased probability of an individual developing cancer (individual carcinogenic risk) due to continuous exposure over a 70-year lifetime, and 2) the potential for adverse health effects other than cancer. The CAPCOA multisource, multipollutant, multipathway risk assessment model developed by Applied Modeling, Inc. and the Santa Barbara County APCD, known as Assessment of Chemical Exposure for AB 2588 (ACE 2588), Version 93288, was used to estimate cancer risk and the potential for adverse health effects other than cancer from inhalation and non-inhalation exposure pathways.

Both gaseous and particulate compounds are emitted by the Escon facility. Once in the atmosphere, these compounds may degrade in the presence of sunlight, undergo complex chemical reactions, or undergo physical transformations to elemental forms. Particulates will ultimately settle to the ground due to gravity. Precipitation may wash emitted compounds (both gaseous and particulate) from the atmosphere and deposit these compounds on the ground. Once deposited, pollutants may be physically or chemically transformed.

Human exposure to emitted compounds results from inhalation of compounds, skin contact, and the ingestion of soil, water, and food that may have come into contact with emitted compounds. Exposure through several routes (such as inhalation and ingestion) is termed multipathway. Pathways other than inhalation must be evaluated in the HRA when compounds are emitted, such as metals, that have a multipathway exposure component. Multipathway compounds are emitted by sources at Escon, and for this reason a multipathway assessment has been performed.

Continuous exposure is computed using a conservative assumption: the individual is assumed to remain at the site of exposure 24 hours per day, 365 days per year, for 70 years. This exposure duration is often termed worst case and is applied to a residential receptor. The exposure duration for an off-site worker is typically assumed to be 8 hours per day, 240 days per year, for a 46-year work life.

According to SDAPCD guidelines all risk assessments shall encompass the area, known as the "Zone of Study", subject to an incremental individual cancer risk from inhalation exposure of five-in-a-million or greater ($\geq 5 \times 10^{-6}$) and for non-carcinogens, the analysis shall bound the area subject to a total health hazard index (THI) (acute or chronic) of greater than or equal to one-half (0.5).

To determine the area impacted by the emissions from the Escon facility a total of 650 receptor points were used in the analysis. A regular grid (24 x 21) of 504 receptors, with a spacing of 300 meters and covering an area of 6.9 km by 6.0 km was combined with a second finer scale 5 x 5 grid with a spacing of 100m centered over the facility, which were used for isopleth plotting to define both the extent of the impacts and the close-in details. A third regular grid (9 x 9) of 81 receptors with a spacing of 50 meters and covering an area of 400 meters by 400 meters was centered over the facility was combined with a set of 4 receptor points that define the facility property boundary, and 1 receptor at the location of the nearest resident were used to define the point of maximum impact (PMI) and the maximally exposed individual (MEI - resident and worker). The health risk was calculated for 29 sensitive receptors and at the centroid of the 6 census tracts that are adjacent to or within the Zone of Study.

1.2 Estimated Worst Case Excess Lifetime Cancer Risk

The total (multipathway) excess individual lifetime cancer risk for continuous exposure was plotted on a detailed map of the area surrounding Escon. The results show that the excess cancer risk exceeds 10×10^{-6} (a probability of 10 in a million) over a region that extends about 750 m from the facility as shown in Figure 1-2. (An isopleth is a line that connects a series of points of constant value.)

The worst-case excess individual lifetime cancer risk is an estimate of the incremental probability of cancer over a lifetime as a result of exposure to Escon emissions. Actual excess cancer risks are likely to be much smaller.

SDAPCD guidelines for preparing HRAs for the AB2588 Act require that maps show areas where excess cancer risk exceeds 10×10^{-6} or acute or chronic THIs exceed 1.0. The hypothetical individual that would experience the highest increased cancer, non-cancer chronic and non-cancer acute risk would be located at the point of maximum impact (PMI). The PMI for cancer risk is at the south-east corner of the plant boundary within the isopleth shown in Figure 1.

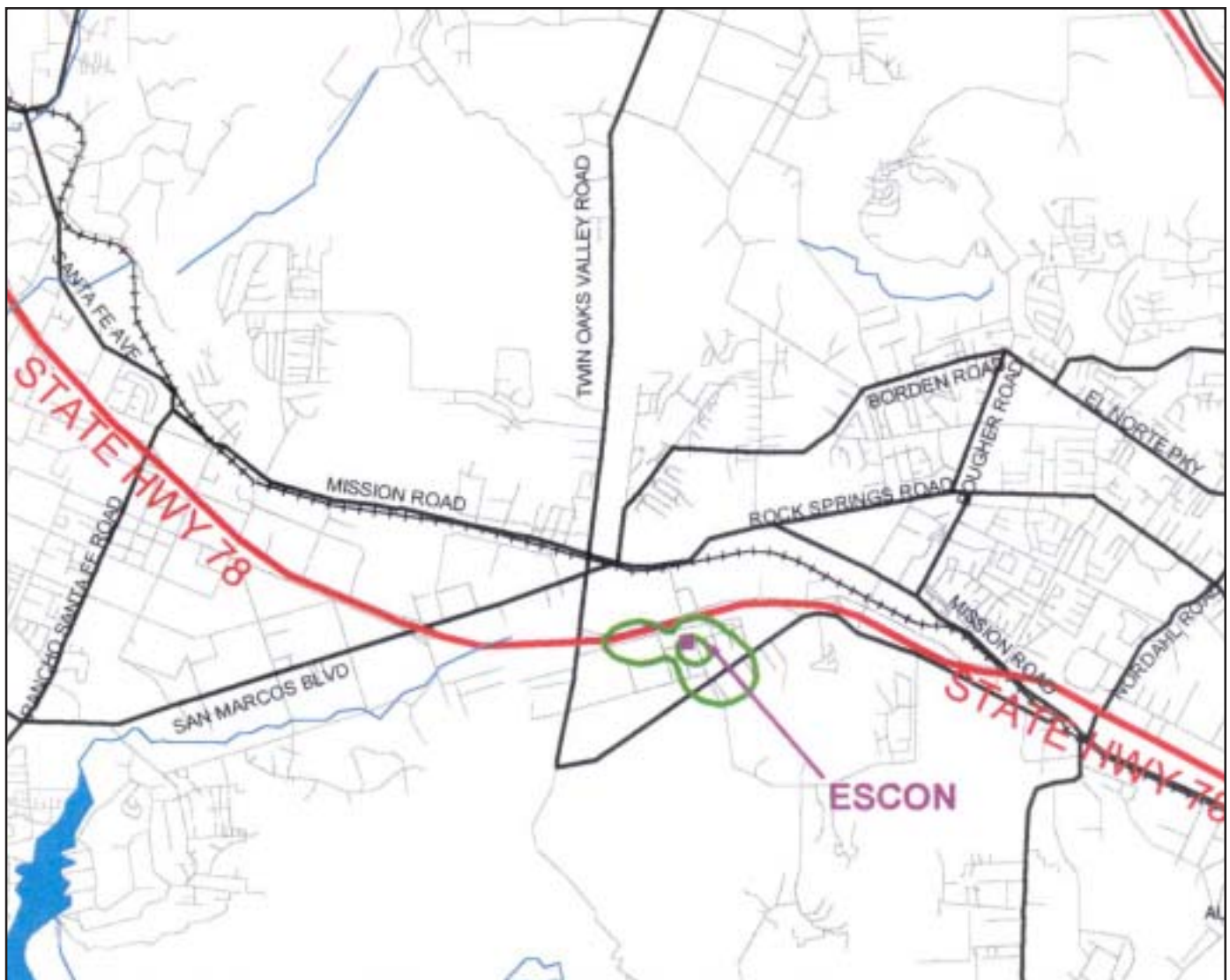


Figure 1 – 70-year Multipathway Cancer Risk – 10 & 50 in a Million Isopleths

The maximum exposed individual (MEI) location for a resident, or MEIR, would be at an actual location where people reside or could reside for 70 years. Primary exposure pathways include inhalation, ingestion of soils, dermal contact with soils, and ingestion of mother's milk as an infant. Exposure durations for residential receptors are very conservatively assumed to be continuous, meaning 24 hours per day, 365 days per year, over a 70-year lifetime. The MEIR is located at the residence located directly across Enterprise Street from the facility. The excess cancer risk at this location is 3.94×10^{-5} (39 per million).

The MEI for a worker, or MEIW, would be located in an area currently zoned or used for commercial or industrial purposes. Exposure pathways include inhalation, soil ingestion, and dermal contact. Exposure durations for workers are typically 8 hours per day, 240 days per year, for 46 years. The cancer risk in commercial/industrial areas is based on resident exposures and have been adjusted by a factor of 0.216 to account only for reduced exposure to workers relative to residents (46 years versus 70 years, 8 hours versus the 16 hours of operation, and 240 days versus 365 days per year). The PMI occurs at the south-east corner of the facility property line and the excess cancer risk at this location is 1.88×10^{-4} (188 per million). The MEIW exposure adjusted cancer risk at this location is 4.06×10^{-5} (41 per million).

The MEI location of the sensitive receptors (MEISR) is typically evaluated assuming the same exposure period as a resident. The MEISR excess cancer risk is 2.04×10^{-6} .

1.3 Excess Cancer Burden

The excess cancer burden is an estimate of the possible increased number of cancer cases in the population surrounding the Escon facility as a result of exposure to carcinogenic compounds emitted by the facility. The cancer burden is the product of the calculated individual risk from the exposure pathways multiplied by the exposed population. A cancer burden of one (1.0) means there is a potential increase of one cancer case for the entire population being exposed. CAPCOA (1993) suggests that an excess cancer burden from a facility of less than one can be considered insignificant.

A very conservative estimate of the cancer burden associated with the emissions from the Escon facility was calculated for this HRA. The estimated excess cancer burden for the combined resident and worker population exposed to the emissions from the Escon facility is 0.019. The cancer burden approximately one-fiftieth of the significance threshold of 1.0.

1.4 Acute and Chronic Non-Cancer Health Effects

A total health hazard index (THI) has been calculated to evaluate the potential for adverse health effects other than cancer from Escon emissions. A THI is defined for each toxicological endpoint (for example, immune or respiratory systems or liver) and is calculated as the sum of the ratios of compound concentrations (modeled health-protective concentration) divided by their respective reference exposure levels (RELs), for all compounds that effect the toxicological endpoint.

The THI for the point of maximum impact (PMI) and the maximum exposed individual worker (MEIW) occur for the same receptors for the acute and the chronic non-cancer effects. The PMI and MEIW chronic respiratory THI is 0.80 and occurs at the South-East corner property boundary receptor. The PMI and MEIW acute respiratory system THI is 3.12 and occurs at the adjoining work site just East of Escon.

The MEIR acute respiratory and chronic respiratory impacts THIs (occur are the nearest resident receptor location located across Enterprise Street from Escon) are 1.61 and 0.16, respectively. The maximum exposed individual sensitive receptor (MEISR) acute respiratory and chronic respiratory THI impacts occur at location of Sensitive Receptor #9 and are 0.29 and 0.0056, respectively.

The isopleths of the acute respiratory system THI are shown in Figure 2. The results show that the acute respiratory system THI exceeds 1.0 over a region that extends only about 200 m from the facility.

No receptor locations had a chronic THI greater than 1.0.

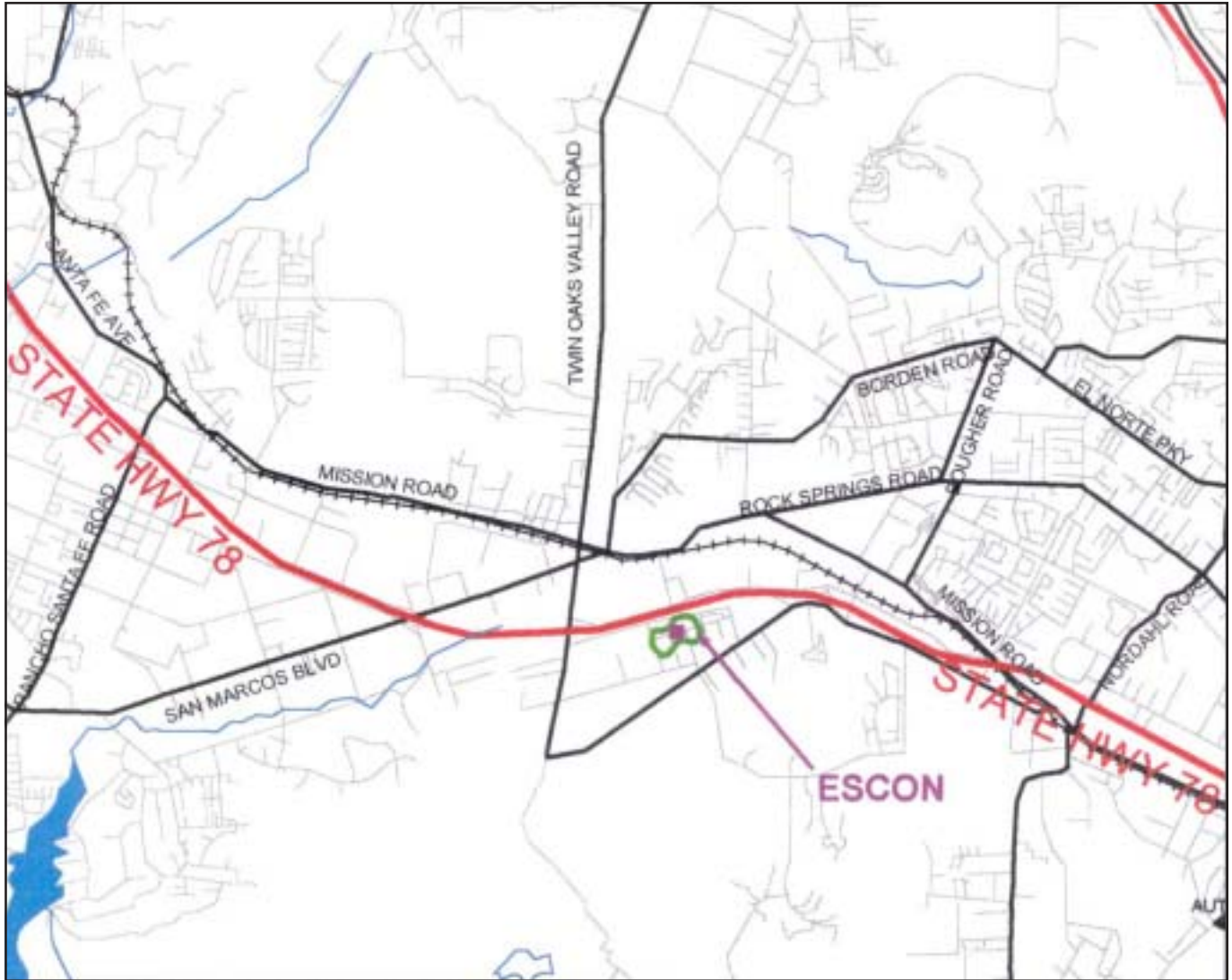


Figure 2 – Non-cancer Acute Respiratory THI – 1.0 THI Isopleth