**Summary of Refined Air Dispersion Modeling Using ISC3
of Formaldehyde from Composite Wood Product Exposure Scenarios**

Scenario 1 – Warehouse-size home repair store

Assumed:
a) composite wood products typically in stock, including bundles of particleboard, medium density fiberboard, hardwood plywood, and cabinet case goods;
b) emission factors from Battelle report (1996);
c) emissions total of 139,159 µg/hr (see attached);
d) emissions are all near large, roll-up door 4 meters high, 7 meters wide;
e) truck access and parking lot outside door, with closest resident 30 meters away.

Used ISC3 air dispersion model in volume-source mode:
a) meteorological data from Burbank, Fresno, Oakland, Pasadena, and San Diego;
b) modeled annual average air concentration 30 meters downwind;
c) annual average concentration of HCHO ranged from 0.012 to 0.022 µg/m^3 .

Risk estimate:
This concentration corresponds to a risk of excess cancer cases of about 0.7 to 1.3 in 10 million (using the OEHHA [2005] unit risk factor of 6.0 x 10^{-6} per µg/m^3).

Scenario 2 – Bundles of particleboard stacked outside under a pole barn

Assumed:
a) 36 bundles of particleboard stacked 24 feet long, 12 feet wide, 8 feet high;
b) each bundle is composed of 32 to 64 boards, depending on thickness;
c) each bundle measures 8 feet long, 4 feet wide, 2 feet high and emits 3,652 µg/hr, based on emission factors from Battelle report (1996);
d) emissions total of 131,472 µg/hr;
e) pole barn is open on all sides and protects the wood from rain;
f) pole barn is 30 meters from closest resident.

Used ISC3 air dispersion model in volume-source mode:
a) meteorological data from Burbank, Fresno, Oakland, Pasadena, and San Diego;
b) modeled annual average air concentration 30 meters downwind;
c) annual average concentration of HCHO ranged from 0.020 to 0.043 µg/m^3 .

Risk estimate:
This concentration corresponds to a risk of excess cancer cases of about 1.2 to 2.6 in 10 million (using the OEHHA [2005] unit risk factor of 6.0 x 10^{-6} per µg/m^3).

References

Battelle. (1996). Determination of Formaldehyde and Toluene Diisocyanate Emissions from Indoor Residential Sources. Final report to Air Resources Board, Contract No. 93-315, Battelle, Columbus, Ohio, Nov. 1996.

OEHHA. (2005). Air Toxics Hot Spots Program Risk Assessment Guidelines. Part II. Technical Support Document for Describing Available Cancer Potency Factors. Office of Environmental Health Hazard Assessment, California EPA, Sacramento, CA.