

Health Risk Assessment

What is the Health Risk Assessment?

As part of the Settlement Agreement signed by Intel, the Neighbors for Clean Air (NCA) and the Northwest Environmental Defense Center (NEDC), Intel hired a third-party consultant to conduct a Health Risk Assessment (HRA) to evaluate the potential health impacts of Intel's air emissions. The consultant performed the HRA according to California's Risk Assessment Program protocol. NCA and NEDC selected the California regulatory program because it represents one of the most stringent risk assessment programs in the United States, and there is currently no comparable risk assessment program in Oregon.

The results of the Health Risk Assessment show that Intel's aggregate present and future emissions are below the risk threshold levels established in the Settlement Agreement. Each step and the results of the HRA were informed and reviewed by an expert hired by NCA and NEDC.

How was the Health Risk Assessment performed?

There were three steps in performing the Health Risk Assessment:

1. **Create an Emissions Inventory:** The Emissions Inventory was created by using inputs from stack testing, production data and chemical usage models to calculate emission rates. The emission rates represent the quantity of a particular chemical that Intel could potentially emit if the company operates at the maximum levels anticipated by Intel's Type 4 Air Permit, issued in 2016. Emission rates are determined for each chemical evaluated as part of the Risk Assessment. The sum of all of the emission rates is referred to as the Emissions Inventory.
2. **Perform an Air Dispersion Modeling Analysis:** The air dispersion modeling analysis was conducted using the Environmental Protection Agency's AERMOD dispersion model using the Emissions Inventory, Intel source information (stack heights, exhaust temperatures and velocities, building sizes, etc.), and local metrological and topographic data. With this information, AERMOD estimated ground level concentrations that were used in the Hotspot Analysis Reporting Program (HARP) model.
3. **Assess the Risk Characterization:** Risk characterization was performed using HARP, which is a computer program developed by the California Office of Environmental Health Hazard Assessment (OEHHA) and the California Air Resources Board, in consultation with California air agency representatives. The HARP model characterized the aggregate risk posed by all of Intel's emissions at residential and sensitive receptors instead of evaluating each pollutant separately. This includes carcinogenic risks, chronic non-carcinogenic health effects, and acute non-carcinogenic health effects. The results of the HARP analysis were compared to established risk threshold levels stated in the Settlement Agreement, which are consistent with those established in California's risk assessment program.

What did the Health Risk Assessment find?

Intel's aggregate present and future emissions are below the risk threshold levels stated in the Settlement Agreement, which are consistent with those established in California's risk assessment program. The results of the Health Risk Assessment are summarized in the table below.

Table ES-1. Summary of Health Risk Assessment Impacts^a and Comparison to the Threshold Levels

Receptor Type	Maximum Increase in Cancer Risk (in one million)	Maximum Chronic Hazard Index	Maximum Acute Hazard Index
Residential	9.1	0.5	0.3
Sensitive	4.3	0.3	0.2
Threshold Level	25	3.0	3.0
Above Threshold Level?	NO	NO	NO

How were the receptors determined?

The receptor grid includes both residential and sensitive receptors in a 10 kilometer radius from each campus, consistent with the Health Risk Assessment protocol.

In order to ensure adequate coverage over all possible residential areas, residential receptors were placed using a systematic grid pattern, with a tight receptor grid close to the facilities and a wider receptor grid further away. The receptors cover the area where residences are located, but do not necessarily correspond to individual residences.

The sensitive receptors correspond to specific locations in the following categories: Elder care facilities (including residential, assisted living and nursing facilities), hospitals, schools and daycare centers.

How did the Health Risk Assessment determine exposure levels?

The exposure levels were determined by the South Coast Air Quality Management District (SCAQMD) guidance. Because the risk model makes intentionally conservative assumptions, it errs on the side of overstating actual risk to a resident. For example, risk assessment modeling for residential receptors assumes a continuous lifetime exposure for 70 years, meaning a resident remains in one spot for the entire 70 years. This is an extremely conservative assumption because most people change places of residence during their lifetime and do not remain at home all day for a 70 year period. In addition, the Health Risk Assessment modeled aggregate present and future emissions from Intel, meaning what Intel could potentially emit if the company operates at the maximum levels anticipated by Intel's Type 4 Air Permit. In other words, the HRA considers the maximum potential emissions and not necessarily today's actual emissions, which are typically lower than this value.

What exposure pathways did the Health Risk Assessment consider?

The Health Risk Assessment evaluated exposure for the receptors through inhalation, consumption of home-grown produce, consumption of home-grown milk, chicken and eggs, dermal absorption, soil ingestion and mother's milk. These pathways of exposure were assessed using California's Office of Environmental Health Hazard Assessment (OEHHA) requirements.

Did the Health Risk Assessment include proprietary substances?

All of the chemicals emitted by Intel and included in the California risk assessment program were evaluated, regardless of whether they were part of a proprietary substance.

Did the Health Risk Assessment include all possible synergistic effects of the air toxins emitted by Intel?

The California risk assessment program does not address synergistic effects, but it does analyze the aggregate impacts of all chemical emissions included in the Health Risk Assessment across multiple exposure pathways.