

# **Intel and Its Neighbors – Air Quality Aspects**

## **Executive Summary**

### **The Settlement Agreement**

In May 2014, Neighbors for Clean Air (NCA) and the Northwest Environmental Defense Center (NEDC) signed a Settlement Agreement with Intel resolving issues raised concerning air pollution emissions from Intel's Aloha and Ronler Acres campuses. The Agreement required Intel to: (i) prepare, in conjunction with NCA and NEDC, an inventory of Intel's emissions of pollutants into the air that may be a concern to the community; (ii) conduct a health risk assessment (HRA) of the pollutants Intel emits to the air; (iii) enhance Intel's stack emissions monitoring program as appropriate; (vi) fund an independent consultant to help NCA and NEDC review and comment on the emissions inventory, testing and risk assessment, and; (v) provide resources to fund ambient air quality monitoring.

### **The Good Neighbor Agreement**

As part of the Agreement, Intel, NCA and NEDC also negotiated a Good Neighbor Agreement (GNA), a cooperative agreement in the form of a binding contract. The GNA was signed in December 2015 and replaced the Settlement Agreement. In addition to implementing the requirements of the Settlement Agreement noted above, the goals of the GNA are to: (i) provide the NCA, NEDC and the public with accurate information about Intel's Oregon operations, including emissions, impacts, and reductions; (ii) reduce emissions from Intel's Aloha and Ronler Acres campuses; (iii) ensure the air quality permits issued to Intel by the Oregon Department of Environmental Quality (ODEQ) are consistent with and include elements of the GNA; and (iv) encourage open communications and understanding between Intel and its neighbors in Washington County. The GNA requires that NCA, NEDC and Intel work together to develop a plan for community ambient air quality monitoring, with Intel supporting the effort by \$150,000 to fund the monitoring.

### **Air Quality Advisory Committee (AQAC)**

An Air Quality Advisory Committee (AQAC) was constituted to implement the requirements of the GNA. Consisting of members of the public and Intel, the AQAC has met quarterly since creation of the AQAC. All of the activities of the AQAC are documented at its website [www.oraqac.com](http://www.oraqac.com). The GNA is provided in its entirety at this website.

The tasks under the Settlement Agreement have now been completed.

### **Emissions Inventory**

An emission inventory for all air pollutant emissions from each of the various activities and sources at Intel's Aloha and Ronler Acres facilities was completed. A third-party consultant, Dr. Ranajit (Ron) Sahu, was hired to assist the AQAC in the effort. Dr. Sahu was granted access to confidential materials by Intel in order to assure that the emission inventory was complete and reflected not just Intel's actual emissions but its maximum permitted emissions under its Type 4 ODEQ air permit issued in 2016. This permit includes the anticipated expansion of the Ronler Acres facility announced in the last few months.

### **Health Risk Assessment**

The emissions inventory was directly used in conducting the HRA. The HRA is a standard methodology in air pollution practice. Using the emissions inventory and representative meteorological data for the area, an EPA-approved air dispersion model (AERMOD) was used to predict the concentrations of various pollutants that are or can be emitted from Intel's facilities under permitted maximum conditions. These predicted maximum concentrations at various "receptor" locations within a 10-km radius of Intel's facilities were then converted to estimates of maximum incremental cancer and non-cancer risks using the Hotspot Analysis Reporting Program (HARP) model, which is a computer program developed by the California Office of Environmental Health Hazard Assessment (OEHHA) and the California Air Resources Board (CARB). In calculating these risks, current HRA practice dictates that conservative (i.e., health-protective) assumptions on exposure, such as a continuous 70-year exposure duration, be made. The HRA considered various exposure pathways such as inhalation, consumption of home-grown produce, consumption of home-grown milk, chicken and eggs, dermal absorption, soil ingestion and mother's milk.

Calculated incremental risks were compared to acceptable thresholds in the Settlement Agreement, which were based on the South Coast Air Quality Management District (SCAQMD)'s Rule 1402 requirements – in place since 1994, and considered to be one of the most robust approaches for such voluntary risk assessments in the country. The Rule 1402 paradigm was used because there was no currently comparable program in Oregon. Each step of the HRA process was overseen by Dr. Sahu. The predicted risks from Intel's emissions were all deemed to be below the Rule 1402 thresholds: the maximum incremental cancer risk for residential receptors was 9.1 in a million and that for sensitive receptors was 4.3 in a million – both below the Rule 1401 threshold of 25 in a million. The maximum chronic non-cancer hazard index for residential and sensitive receptors, respectively, were 0.5 and 0.3 – both below the Rule 1402 threshold of 3.0. And, the maximum acute non-cancer hazard index for residential and sensitive receptors, respectively, were 0.3 and 0.2 – both below the Rule 1402 threshold of 3.0. All of the details of the HRA including the emission rates of the various pollutants (i.e., the emissions inventory), the meteorological data used, and the selection of receptors, including sensitive receptors, are provided in the HRA report located at the AQAC website, [www.oraqac.com](http://www.oraqac.com).

### **Hillsboro Ambient Air Monitoring Project (HAMP)**

After the completion of the HRA, the ambient air monitoring project (the Hillsboro Ambient Air Monitoring Project, HAMP) was initiated. The goal of the monitoring project was to measure, directly, in ambient air surrounding the Intel facilities, the concentrations of various air pollutants that are emitted from Intel's facilities. As such, four monitors were located where the previous HRA (and associated dispersion modeling) had indicated the likelihood of maximum impacts, consistent with prevailing winds (generally from the north/north west), as well as cross winds. The primary monitor locations were at Rosebay Park and Central Park. Secondary monitors were located at Orange Lot and Liberty High School. In addition, an urban background monitor was located at Hare Field. Air Sciences, Inc., a Portland, Oregon, firm was selected to conduct the air monitoring, which was completed between January 31 – July 31, 2018. Oversight was provided by Dr. Sahu, on behalf of the AQAC.

Details of the monitoring project, including monitoring locations, data collection, metrological input, testing equipment, data collection thresholds and limitations, sampling methods, chain of custody, and quality control processes are located in the Quality Assurance Project Plan (QAPP). The results of the

monitoring project are provided in a monitoring report. Both the QAPP and the final report are located at the AQAC website, [www.oraqac.com](http://www.oraqac.com).

The monitoring program was designed to measure multiple pollutants at multiple locations over the course of multiple months although the pollutants monitored were a subset of the chemicals included in the HRA, selected based on their risk potential – i.e., those that posed the highest risks. While the primary task of the HAMP was to measure specific pollutants associated with Intel’s manufacturing operations, by its nature, ambient monitoring will also capture pollutants from all sources at the monitoring location, including transportation sources and contributions from other sources as dispersed by prevailing winds. Thus, results of ambient monitoring are not directly comparable to the results of dispersion modeling from just Intel’s sources at their maximum permitted rates. And, since any estimation of risks from the results of ambient monitoring could contain contributions from all sources and not just from Intel’s operations, converting measurement concentrations to risk was not attempted.

In order to provide context to the individual monitoring data points, meteorological parameters such as wind speed and wind direction on the monitoring days were obtained from the Hillsboro Airport. In addition, a meteorological station was also provided at the Liberty High School location.

The results of the ambient monitoring program indicate that results were below acceptable standards for pollutants such as fine particulate matter (PM<sub>2.5</sub>), ammonia, and hydrogen fluoride. For all other compounds monitored, where robust comparison standards are not available – such as for isopropyl alcohol, a common solvent, used extensively at Intel; or metals that are contained as part of the dust or fine particulate matter – the results were generally low and in many instances below detection limits.

The results of the HAMP should provide reassurance to Intel’s neighbors that the overall impact of Intel’s air emissions on the surrounding area is minor.