Community Environmental Working Group Accomplishments (August 2004 – June 2006) "Striving for Continuous Environmental Improvements at Intel"

1. **Task Force Recommendation:** *Intel should formalize the monthly meetings it has been holding into a Community Environmental Working Group with membership from a cross-section of the community, including its strongest critics, to: 1) provide visibility into facility operations; 2) disseminate information on Intel environmental performance; and 3) enable members to have an effective voice in shaping environmental decisions.* (See information under #3 recommendation.)

2. **Task Force Recommendation:** *This is a two-part recommendation. First, Intel should coordinate/sponsor a monthly forum to update CRCAW, SWOP and the community on their operations and environmental performance. Second, Intel should use the forum to listen to the individual concerns and work to resolve them to the best of their ability.* (See information under #3 recommendation.)

3. **Task Force Recommendation:** *I believe that CRCAW and SWOP have provided a valuable service by continuing to "look over Intel's shoulder". I would like to see that process institutionalized so that there is a continued community presence in Intel's decision-making process.*

   The Community Environmental Working Group held its first meeting in November 2004 and to date has met 19 times. John Bartlit, New Mexico Citizens for Clean Air and Water, chairs the Working Group. Other members include Hugh Church, American Lung Association; Lane Kirkpatrick, Corrales resident; Edward Pineda, Rio Rancho; Gordon Ross, Pueblo los Cerros; and Mike Williams, New Mexico Citizens for Clean Air and Water. CRCAW, SWOP and other critics of Intel have been invited to join the Working Group but have declined the invitation until they see proof that the Working Group is making a difference.

   The Working Group is committed to making continuous environmental improvements, including the reduction of Intel's chemical emissions and improving community dialogue. Membership is open to anyone who wants to help achieve the group's mission. Meetings are held on the third Wednesday of each month, from 5-7 p.m. at Your Place or Mine Catering, Country Club Plaza, 3301 Southern Blvd., Suite 500, Rio Rancho. The public is invited to attend the meetings and are urged to participate throughout the meeting.

   Community updates and notification of future Working Group meetings are published each month in the Rio Rancho Journal and the Albuquerque Journal Westside. When an earlier deadline can be met, the updates are also published in the Corrales Comment. Intel pays the cost of the monthly advertisements. Meeting agendas and summaries are also posted on Intel's neighborhood relations website at http://www.intel.com/community/newmexico/cewg.htmhttp://www.intel.com/community/newmexico/cewg.htm. Notices and meeting agendas are emailed to area residents and participants in the Corrales Air Quality Task Force.

   The Working Group is currently focusing on the following:
   1. Continuous improvements related to air emissions, rather than health studies.
   2. The unanimous recommendations of the Corrales Air Quality Task Force.
   3. Other recommendations from the task force, community and Working Group members.

4. **Task Force Recommendation:** *Intel should involve the community in determining dates and times for Intel stack sampling and allow community members to observe the testing. This enhanced*

visibility will provide greater assurance that the testing is not biased and is representative of stack emissions. (See information under #5 recommendation.)

5. **Task Force Recommendation:** *Intel should work with the Community Environmental Working Group to establish a continuous performance monitoring system for the site boilers, thermal oxidizers, and scrubbers. The information from the monitoring should be made available to the public.*

Working Group members observed the 3rd Quarter 2004 scrubber and stack testing which included a tour of the Fab sub-floor, main floor and roof. During the tour, members created a list of questions and topics to be explored at future meetings. At the request of the Working Group, Intel has invited local residents to observe the testing and the New Mexico Environmental Department conducted a surprise inspection of Intel. Also, Intel has extended an open invitation to Working Group members and public to tour its facilities to monitor manufacturing operations during the testing periods. This invitation has been emailed to the distribution list.

After observing the testing and reviewing the testing/monitoring requirements in the permit, the Working Group has not explored any additional testing. The Working Group continues to explore the public's lack of trust which leads to doubts of the value of all stack testing and oversight by Intel or the state. Quarterly stack testing schedules are distributed at Working Group meetings to keep the community informed of the testing that has been scheduled and completed.

Working Group members pursued the following key questions with Intel staff.

- Are the monitoring equipment and methods accurate and reliable? Do the monitors analyze for all necessary components?
- Do the monitoring results represent typical plant operations and how do we know?
- What are the impacts of equipment failures, upsets and downtime, and how often do they occur? Are emission abatement control equipment upsets and downtimes excessive, and what can be done to reduce them?
- What fugitive emissions are being monitored?
- What is the variability in emissions average over an actual hour vs. emissions averaged over a day, month or year, and how is this known?

Following the presentation, Working Group members drew the following conclusions.

- Isopropyl alcohol (IPA) is emitted through the general factory exhaust and does not go through any abatement process and accounts for 38% of all VOC emissions. The majority of the IPA which is untreated comes from the cleaning of production equipment in the factory. To reduce emissions, IPA is being used more efficiently, using less to do the same cleaning.
- Most of the abatement equipment downtime is for preventative maintenance.
- It does not appear there are wide variations in emissions but there are changes in weather surrounding the site that result in variability of dispersion.

Isopropyl Alcohol

Although IPA has a low toxicity, some residents have expressed concern about potential synergistic effects of alcohols and acetone. Working Group members suggested that Intel look for ways to reduce the IPA emissions. In response, Intel formed an IPA team which is making procedural changes to reduce the amount of IPA being used during equipment cleaning in its Rio Rancho Fabs.

Other suggestions provided by Working Group members include a passive filtration system such as charcoal and control of emissions from general factory exhaust system. This suggestion is still being investigated. The group also asked if factory exhaust could be monitored with FTIR for 24 hours to determine the rate of IPA actually being emitted.

Preventative Maintenance

During the November 2004 meeting, members:

- Focused on the downtimes for the scrubbers and thermal oxidizers that remove chemicals from Intel's air emissions (most downtimes are for doing scheduled maintenance and others are for operating problems).
- Considered the chemical emissions during downtimes, which are a small portion of the company's yearly total emissions
- Identified ways to reduce the downtimes and thus the unabated emissions during those times.

The working group suggested Intel pursue a 24-hour maintenance schedule instead of the 8-hour schedule which results in equipment being off-line during the night when air dispersion is lower. Following the suggestion of the group, Intel has compressed the preventative maintenance schedule for the oxidizers cutting the downtime by more than 70% - 342.6 hours in 2004 and 100.6 hours in 2005. The average downtime for preventative maintenance was reduced from about 49 hours to 17 hours. John Bartlit, chair, attended a luncheon to thank the technicians for implementing the group's idea.
The charts below report 1,757 pounds or .88 tons of unabated VOC emissions have been cut due to the maintenance schedule changes implemented in 2005.

Report Tracking Number	Equipment Involved	Date System Down	Date System Restarted	Total time in bypass (hrs)	Estimated VOC emissions (lbs)
EHS-04-1.004	F11S RTO	3/9/2004	3/11/2004	57.2	413.2
EHS-04-1.013	F11W RTO	4/27/2004	4/29/2004	62.2	620.3
EHS-04-1.018	Fab 7 RTO	5/11/2004	5/12/2004	38.8	15.6
EHS-04-1.028	F11X Bridge RTO	9/6/2004	9/7/2004	39.75	66.0
EHS-04-1.029	F11X FAB RTO	9/20/2004	9/21/2004	39.1	278
EHS-04-1.030	F11S RTO	10/18/2004	10/20/2004	43.3	312.8
EHS-04-1.033	F11W RTO	11/2/2004	11/4/2004	62.2	635.7
2004 Average:				48.9	N/A
2004 Total:				342.6	2,341.6

Report Tracking Number	Equipment Involved	Date System Down	Date System Restarted	Total time in bypass (hrs)	Estimated VOC emissions (lbs)
EHS-05-1.005	Fab 11W RTO	4/28/2005	4/28/2005	17.2	175.8
EHS-05-1.007	Fab 11S RTO	5/4/2005	5/4/2005	14.7	106.2
EHS-05-1.020	Fab 11X Bridge	9/7/2005	9/7/2005	15.6	25.9
EHS-05-1.022	Fab 11X Fab RTO	9/20/2005	9/21/2005	23.2	165.7
EHS-05-1.024	Fab 11S RTO	10/19/2005	10/19/2005	15.4	111.0
EHS-05-1.026	Fab 11W RTO	11/1/2005	11/4/2005	14.5	146.7
2005 Average:				16.8	N/A
2005 Total:				100.6	584.6

Scheduling Maintenance
Based on an idea developed by the Working Group, Intel will work to avoid down times during the months when air dispersion is restricted (no burn season). The change will reduce the impact of unabated emissions on the surrounding communities. The "no burn" season for the Albuquerque area is October through February.

The working group has explored the feasibility of redundant thermal oxiders but has not made any suggestions to Intel. However, as said, the planned downtime of the oxidizers has been reduced by more than 70%.

6. **Task Force Recommendation:** *Intel should ask local emergency response agencies such as Rio Rancho Department of Public Safety, Corrales Fire Department, or the City of Albuquerque Fire Department to review Intel's protective systems and procedures and officially report to the community.*

In December 2004, the Working Group invited emergency responders to participate in a panel discussion on Intel's emergency and protective systems. Panelist included:

- Rick DeWeese, Assistant NM Site Emergency Manager, Intel
- Jeff Anderson, Fire Chief, Rio Rancho Dept of Public Safety
- Anthony Martinez, Corrales Fire Department
- Jess Lewis, Deputy Chief, Fire Operations, Sandoval County Fire Department

The panelists reported on the planning and ongoing coordination between their agencies and local Intel staff. The responders stated Intel is not one of our major worries. The emergency response program has been tested in full-scale drills and real events.

Following the discussion, Working Group identified the following opportunities for improvement. These items remain on the group's future topic list.

- Better public information about the emergency response programs
- Better public notification in an emergency
- Improved wind data and prediction of the movement of chemical emissions in an emergency

During the meeting, the Corrales Fire Department requested additional coordination with Intel. Although Corrales is not a first responder but would provide support, Intel staff provided detail briefings and site tours with the fire department. The coordination with Corrales continues and Intel donated $10,000 to the community for additional fire department training.

7. **Task Force Recommendation:** *Require Intel to notify its neighbors and NMED in advance of maintenance and other down times for abatement equipment.*

Intel notifies NMED of the planned and unplanned down times of the abatement equipment. A record of this notification and estimate of the unabated emissions is included in the monthly EHS report that is distributed to Working Group members and the public.

Although Intel has a telephone information line where residents can receive information about current and future site activities, the Working Group explored additional, more flexible methods of communicating with the community.

At the request of the group, Intel pursued the development of a New Mexico Intel website to provide more detailed information. Due to corporate web page protocols, the working group is unable to establish an independent website and was required to continue using the existing CEWG web page. The group continues to look for improvements to the communication with the community.

8. **Task Force Recommendation:** *NMED needs to carefully monitor excess emission events at Intel and analyze their potential effect on the nearby community.*

Due to Working Group requests for additional information, Intel developed a monthly EHS Activity Report. This report includes: plant status; monitoring; inspections/meetings; site events; information

requested by or provided to regulatory agencies and complaints received. In addition, quarterly emission reports are distributed to the group and public.

9. **Task Force Recommendation:** *Intel should reaffirm their commitment to actively look into conversion to the new clean process (Super Critical CO2) as soon as possible, as a promise to the community to reduce both their emissions and their use of water.*

To better understand the state of the SCCO2 technology, the Working Group hosted an expert panel discussion in October 2005. Approximately 50 residents, working group members and Intel staff attended the meeting. Panelists were:

- Craig Taylor, Los Alamos National Laboratory
- Richard Reidy, University of North Texas
- Gunilla Jacobson, Stanford University

According to the three national experts, supercritical CO2, a new technology which may reduce water and chemical use, is not ready to use in the computer chip industry. Key problems the experts cited were:

- unavailability of tools to manufacture chips using the new technology
- questions of chemical compatibility with other processes
- higher costs than current cleaning methods, a little more or perhaps three times more

All the experts believed the problems can be solved and the technology could be used when chip makers retool to make wafers described as "32-nanometer" in the future. Intel continues to fund and participate in the development of the SCCO2 and other technologies which will reduce water and chemical use during the manufacturing process.

The remaining accomplishments are in addition to the task force recommendations listed above.

10. **$6.7 million Environmental Improvement Project**

In 2004, a $6.7 million environmental improvement project was begun to upgrade Intel's emission control equipment and provide additional redundancy to existing systems. These improvements include:

- Installation of 3 additional ammonia scrubbers and support systems as redundancy for the existing ammonia scrubbers so that emissions can be rerouted and treated during planned maintenance activities.
- Installation of a second acid gas scrubber on the Central Utilities Building to provide redundancy for the existing scrubber.
- Upgrades to existing scrubbers and thermal oxidizers to reduce unscheduled downtime.

11. **Review of Intel's Risk Assessment Update**

Members of the Working Group were given draft copies of the risk assessment for their review. Also, representatives from ERM provided an overview of the assessment and answered members' questions. More than 100 comments and questions were submitted by the Working Group. Many of the group's comments resulted in changes to the final risk assessment report.

The Working Group also requested that Intel provide copies of the assessment on CD. Intel reported this task was not included on the original scope of work and ERM had concluded its contractual commitments. Also, many of the documents are not in electronic form and cannot be easily transferred to a CD. Staff stated they would provide hard copies to anyone who would like a copy and would consider requiring the contractor to provide CDs of future updates.

12. **Emission Factor Updates**

Critics continue to oppose Intel's use of emission factors to calculate emissions. To better understand emission factors, the Working Group requested a detailed presentation on how the factors are calculated and tested. Presentations were made to the group in 2005 and 2006 detailing the history, use, and testing of emission factors, at Intel and nationwide under the auspices of the US Environmental Protection Agency. To date, the group has not provided any new ideas to Intel regarding emission factors.

The public can find more information on emission factors on the EPA website: http://www.epa.gov/oar/oaqps/efactors.htmlhttp://www.epa.gov/oar/oaqps/efactors.html.

13. **Cooling Towers Improvement Project and Odor Team**

The Working Group has reviewed past and current complaints regarding odors. Intel reported the establishment of an Odor Team which conducts regular tours of the site to identify odors. The team has occasionally smelled musty and moldy odors coming from the cooling towers.

Intel pursued with the group, a plan for sampling the cooling towers to identify potential sources of odors on the site. Several improvement projects are also underway including a filtration system, new equipment which monitors bacteria and adds biocides in smaller amounts only when needed and a pH control system. Members asked Intel to consider evaporation from the sump which would result in a lower plume.

Because NMED forwards odor complaints without location to ensure privacy, the working group suggested the creation of a quadrant map of Rio Rancho and Corrales which could be used by NMED to give general location of the complaint. Intel created the map and NMED has agreed to use the map to identify location of complaints.

14. **Environmental Quality Statement**

After a presentation on Intel's corporate values, the Community Advisory Panel talked about the lack of a value specific to the environment. The CAP charged the Working Group with creating a potential environmental value statement to be sent to Intel.

After considering several options, the Working Group agreed to suggest the following new quality value - continuously enhance environmental quality and diminish adverse impacts. In addition, the group suggested a change to the Corporate EHS policy statement, and the incorporation of meaningful two-way communication with the community.

The ideas have been given to the Intel team currently updating the environmental policy statement.

15. **Improved Community Dialogue**

Working group chair, John Bartlit, was quoted in Intel's Global Citizenship Report on the importance of community dialogue. The group also explored how to improve the distribution and understanding of evenhanded environmental communications all around. No ideas have been identified to date but the importance of community dialogue and how to distribute information to the community remains a priority of the group. Developing an effective two-way exchange of information between the community and Intel remains a priority.

16. **Water and Wastewater**

Working group members are also interested in Intel's water use and discharge. The group invited Stuart Reeder, City of Albuquerque Publicly Owned Treatment Works, to report on the oversight of Intel's wastewater which is sent to the POTW. Mr. Reeder stated that Intel has only had one violation in 1998 for not submitting a report on time and the Company meets or exceeds all water quality requirements.

Intel presented information on the site's past, present and future water use. Information was provided on conservation and reuse projects in place or in development to reduce the amount of water used. The group has also invited the State Engineers Office to attend a future meeting to talk about water quantity. No ideas for continuous improvement have been provided at this time.

In February 2006, the Working Group held a joint meeting with Intel's Community Advisory Panel for a presentation on Intel's participation in the Rio Rancho Water Reuse Project. The project will enhance the City's wastewater infrastructure and treatment enabling Intel to use more reuse water instead of groundwater.

17. **Other Improvements**

Bulk Silane – Intel pursued the potential of changing to a bulk delivery system of Silane instead of the current smaller canisters to supply increased demand. After the presentation, the group agreed the bulk system seemed to be more safe but requested additional information prior to the installation of the new system. After the working group presentation, the transition to the bulk system was put on hold since chemical demand did not change.

Methanol - Improvements to methanol abatement process have increased removal of emissions from 60% to 96%. This change means methanol emissions are reduced to one-tenth the previous amount (that is, 4% emitted, instead of 40%).

Weather Tower - A working group member expressed concern about the location of structures near the weather tower. After a review, Intel agreed to move the shipping/storage containers back 100 meters as requested by the CEWG. The current location of tower was analyzed by the third-party operator who felt the location was the best possible on the site.

PM 2.5 – The Working Group requested information on the PM 2.5 regulations. Intel stated there are no current state regulations. The group will continue to monitor the Western Air Partnership study on PM 2.5 and have requested information on how the California sites address PM 2.5. The EPA is currently making new recommendations for PM 2.5 limits.

Permit revision for new Fab 7 – The new test facility in the old Fab 7 was initially going to require installation of new generators and the impact to the permit was discussed with the Working Group. Since then, it was determined no new generators were needed. Intel will continue to inform the working group of any changes due to the new activities in Fab 7.

Silica – The Working Group has researched concerns from the critics about the form and hazard of silica that is produced by Intel. The group is continuing to explore this issue.

Plant Production – Critics suspect Intel alters its planned production at times to minimize air emissions when emission testing is occurring on site. Working Group members invited the Intel manufacturing manager to tell the members how the fabs operate and the potential for changing emissions on demand. Mr. Rashap stated that to cool down the plant to cut emissions would take 1-2 days to stop production and 12-18 hours to restart, resulting in a 3-4 day impact on chip output. The large dollar loss from such a change would hurt Intel's business interests. Intel extended an invitation to interested individuals within the community to tour the Intel facilities and observe the manufacturing operations in progress during emission testing.

Future Topics

Working Group members will continue to seek continuous improvements in Intel's environmental performance and the two-way exchange of information with the community. The following is a list of topics the group will be working on during the next several months. Some of the improvement projects are in process and others are new issues to be explored.

Progress Yet to be Made:

- Two task force recommendations are still under consideration.
- Emission Spikes
- Odor Reduction – Cooling Tower Improvements
- Permitted emission levels
- Water use
- Improved public dialogue
- Coordination with NMED
- Fugitives

Future Updates:

- Request update on Supercritical CO2 in Summer of 2007
- Potential EPA regulation changes regarding particulate emissions
- Update to air quality model used by emergency responders

Update only if changes or additional progress made:

- Isopropyl Alcohol
- Pesticide Use