March 8, 2024

Submitted electronically to nwraqpermits@deq.oregon.gov

Oregon Department of Environmental Quality
Attn: Northwest Region Air Quality Permit Coordinator
700 NE Multnomah Street, Suite 600
Portland, OR 97232

Re: Public Comment regarding Proposed Air Quality Permit No. 34-2681-ST-02 for the Intel Corporation facilities in Washington County

Dear Oregon Department of Environmental Quality:

Oregon Department of Environmental Quality ("DEQ") proposes to issue an Air Contaminant Discharge Permit ("ACDP") (hereinafter "Draft Permit") to the Intel Corporation ("applicant"), combining two permitting actions.[1] The Draft Permit will facilitate Intel's increased production of semiconductor products at two facilities in Washington County: the Ronler Acres campus in Hillsboro, and the Aloha campus in Aloha. The proposed Permit will allow for a significant increase in production capacity. However, with this expansion comes a substantial increase in emissions.[2] Intel's requested Plant Site Emissions Limits ("PSELs") include increases as follows: approximately 27 tons per year ("tpy") for Particulate Matter ("PM"), 27 tpy in PM_{10}, 29 tpy in $PM_{2.5}$, 369 tpy in Carbon Monoxide ("CO"), 216 tpy in Nitrogen Oxides ("NO_x"), 173 tpy of Volatile Organic Compounds ("VOCs"), and 906,560 tpy of greenhouse gases ("GHGs").[3] While commenters are appreciative of opportunities to engage with Intel and DEQ, it is imperative that DEQ utilize its authority to increase monitoring and emission verification requirements in order to ensure that increases in Intel's production does not come at the expense of public health, environmental quality, or commitment to Oregon's climate goals. Indeed, Commenters believe DEQ may not issue this ACDP without increased source testing, monitoring obligations, and emissions verification systems integrated into the final Permit.

The Northwest Environmental Defense Center, Neighbors for Clean Air, Green Energy Institute at Lewis & Clark Law School, Oregon Environmental Council, Beyond Toxics, Verde, Oregon League of Conservation Voters, Oregon Physicians for Social Responsibility, 1000 Friends of Oregon, Save Helvetia and the Sierra Club (collectively, "Commenters") submit these comments urging DEQ to take a closer look at Intel's projected emissions and provided modeling, and to impose more stringent monitoring and verification requirements necessary to ensure compliance with state and federal law. Below you will find a substantive discussion of the Draft Permit submitted by Commenters, as well as Technical Comments prepared by

[1] Oregon Department of Environmental Quality, Air Contaminant Discharge Permit Draft No. 34-2681-ST-02 (hereinafter "Draft Permit").
[2] DEQ, Air Contaminant Discharge Permit- Major New Source Review, Review Report for Intel Corporation (hereinafter "Review Report") at 5.
[3] Review Report at 5.

Commenters' Air Quality Consultant expert, Dr. Ranajit (Ron) Sahu.[4] His comments are incorporated herein, referenced throughout, and attached as Exhibit 1.

Commenters have significant interests in protecting air quality throughout the state, as well as ensuring that DEQ meets Oregon's commitments to climate resiliency and public health. Commenters have members and supporters who work, visit, recreate, or live near the Intel sites at issue. Commenters also have members throughout the state that are deeply concerned with the integrity of Cleaner Air Oregon ("CAO") and the Climate Protection Program ("CPP"). Commenters are concerned that this Permit, if not strengthened, will have considerable adverse impacts on the air quality of the region, as well as the entire state of Oregon. As a major emitter of various pollutants, and a source of hazardous air pollutants, the facility will adversely impact the air quality of the local air shed, the health of the surrounding community and environment, the global climate, and will thwart progress towards reaching the goals of the CPP and CAO.

Commenters point out, as an initial matter, that minimizing emissions from semiconductor production is imperative to uphold a commitment to a just transition. As the global demand for semiconductors surges, so does the environmental and public health impact of their production. The semiconductor manufacturing process is characterized by high-energy consumption, use of hazardous materials, and significant greenhouse gas emissions. A just transition necessitates addressing these emissions at the front end to mitigate the impacts that are disproportionately borne by surrounding, and oftentimes frontline, communities. It is simply not enough to solely divest from fossil fuels without paying credence to the disproportionate impacts that historical consumption has thrust upon marginalized communities. While commenters recognize that semiconductors play a crucial role in transitioning towards a green economy, as well as provide promising economic opportunities for the state, this process must prioritize equitable opportunities that protect the health and well-being of communities. A just transition is one that redresses past harms, creates new relationships of power and prioritizes uplifting communities that have historically borne the brunt of environmental degradation. To facilitate a just transition—one that aligns with Oregon's own policies—DEQ must ensure that Intel's emissions are stringently minimized, monitored, and verified. Broadly speaking, if DEQ is not equipped to ensure production does not increase at the expense of Oregon's communities and environment, it is not equipped to reap the benefits of this expansion. Commenters urge DEQ to analyze next steps in a manner that prioritizes principals of a just transition, to ensure that communities and environmental quality are placed at the forefront.

It is important to note that Intel has poured resources into this permitting process. This is seen in the use of the Receipts Authority and the rapid development of the Permit. More concerning, however, is how Intel has utilized its leverage to bar meaningful and accessible review of emissions data and modeling analysis. Intel also failed to provide a reasonable explanation of how emissions and air quality impacts were calculated and substantiated for the purposes of compliance with state and federal law. This has substantially hindered the public's ability to engage with and verify the provided materials. Further, with its considerable economic influence and technical expertise, Intel often holds significant leverage in negotiations with

[4] Dr. Ranajit Sahu, Technical Comments on DEQ's Proposed Permit No. 34-2681-ST-02, R-03 Issued to Intel Corporation, Aloha Campus (Application No. 034907/034188) (hereinafter "Exhibit 1").

regulatory bodies and engagement with the public when it comes to developing emissions standards and limits. This level of autonomy comes at the expense of meaningful public engagement, as well as public trust in the regulatory process. Such a scenario underscores the importance of robust regulatory oversight to ensure that corporations like Intel adhere to stringent environmental quality and public health standards and prioritize the well-being of communities affected by its operations. These commitments will also help Intel reach its own climate articulated climate goals. As such, Commenters strongly urge DEQ to ensure that proper emissions verification and monitoring procedures are in place before this Permit is issued.

DISCUSSION

It is the public policy of the State of Oregon "[t]o restore and maintain the quality of the air resources of the state in a condition as free from air pollution as is practicable, consistent with the overall public welfare of the state." ORS 468A.010(1)(a). The purpose of Oregon's air pollution laws is "to safeguard the air resources of the state by controlling, abating and preventing air pollution under a program which shall be consistent with the declaration of policy in this section." Given the significant increases in criteria pollutants, GHGs, and Hazardous Air Pollutants ("HAPs"), DEQ must require more stringent monitoring to ensure proper verification of Intel's emissions, to both ensure compliance with state and federal law, and ensure that communities and the environment are protected to the maximum extent practicable. This is especially so in light of Intel's plans to operate in a fundamentally different manner moving forward.

Historically, Intel has used these facilities to produce semiconductor chips for its own products. However, Intel has announced that it plans to operate as a "foundry" in the future, producing chips for its own products, as well as for other companies.[5] The ACDP presumes that processes and corresponding emissions for contract manufacturing will be substantially similar. However, this presumption must be supported and verified. This is so because market demands and consumer needs may result in different "recipes" and steps in the manufacturing processes, which could produce emissions variances. This drastic shift in operational plans is not adequately reflected in the Draft Permit's conditions. Indeed, the Permit grants Intel substantial latitude to modify its operations, including the ability to make modifications to manufacturing processes, without prior notification to DEQ.[6] This latitude, if not properly monitored, could lend itself to operational changes that jeopardize compliance with the federal Clean Air Act programs.

This deficiency can be remedied by imposing, in the Permit, more comprehensive monitoring obligations to ensure that Intel does in fact comply with the proposed Permit's PSELs, and all relevant NAAQS, under all future market-driven operational changes. With Oregon's state policy, as well as Intel's future operational changes in mind, Commenters urge DEQ to impose more stringent monitoring and verification processes for the reasons outlined below. Commenters also point out that Intel seeks to substantially increase emissions of a number of its criteria pollutants in a manner that is presumably proportionate to its increases in

[5] *See, e.g.*, https://www.bizjournals.com/portland/news/2024/02/21/intel-foundry-microsoft.html

[6] Draft Permit at 8.

production.[7] However, its HAPs emissions do not increase from the previous permit. Commenters have been unable to access information to substantiate how it is possible to facilitate such an increase of criteria pollutants with no increase in HAPs emissions. Accordingly, Commenters urge DEQ to verify these PSELs both for accuracy, but also to ensure that the Applicant is properly classified as an area or minor source, rather than a major source of HAPs.

Table Sahu-1: Intel's PSEL Breakdown and Major Sources Contributing to Respective PSELs

RA and Aloha PSEL Summary (tpy)	NOx		CO		VOC		PM	PM10	PM2.5		Fluorides		HAPs	
Boilers	19.69	4.8%	58.64	9.8%	8.55	2.4%	3.89	3.89	3.89	6.6%	-		0.14	0.7%
EGENs	52.46	12.7%	4.28	0.7%	0.96	0.3%	0.48	0.48	0.48	0.8%	-		0.35	1.7%
RCTOs	80.73	19.6%	106.28	17.8%	150.01	42.8%	19.05	19.05	19.05	32.2%	0.002	0.0%	0.13	0.6%
EXSC Scrubbers	192.68	46.7%	327.92	54.8%	36.92	10.5%	28.11	27.17	25.65	43.3%	12.13	97.0%	17.47	84.6%
EXAM Scrubbers	43.45	10.5%	81.51	13.6%	86.51	24.7%	13.55	8.54	8.27	14.0%	0.04	0.3%	0.04	0.2%
PSSS Scrubbers	-		-		-		0.71	0.44	0	0.0%	-		-	
Fugitive VOCs	-		-		65.82	18.8%	-	-	-		-		-	
Heaters	10.41	2.5%	17.13	2.9%	0.57	0.2%	0.26	0.26	0.26	0.4%	-		0.02	0.1%
TMXW	12.23	3.0%	1.1	0.2%	0.2	0.1%	0.09	0.09	0.09	0.2%	-		0.004	0.0%
Lime Silos	-		-		-		0.44	0.44	0.44	0.7%	-		-	
Cooling Towers	-		-		-		8.81	7.19	0.03	0.1%	-		-	
Aggregate Insignificant Activities	1	0.2%	1	0.2%	1	0.3%	1	1	1	1.7%	0.3	2.4%	2.5	12.1%
Paved Road Emissions	-		-		-		0.75	0.15	0.04	0.1%	-		-	
Total	**412.64**		**597.86**		**350.54**		**77.16**	**68.71**	**59.21**		**12.5**		**20.65**	
Current PSEL	197		229		178		41	35	31		6		24	
Requested PSEL	413		598		351		68	62	60		12.5		24	
% Increase Requested	*110%*		*161%*		*97%*		*66%*	*77%*	*94%*		*108%*		*0%*	
		89.5%		96.1%		78.0%				89.5%		97.0%		84.6%

Table 1: The yellow highlighted items, for each pollutant, show the major contributors to that pollutant, with the sums of just the yellow-highlighted contributions tallied in the last row.[8]

1. The information provided fails to provide a reasonable basis for many assumptions

An applicant is required to submit "all information necessary to perform any analysis or make any determination required under" the air quality analysis rules.[9] Assumptions used in Intel's modeling, which form the basis of PSELs and an ultimate determination of Clean Air Act ("CAA") compliance, must be submitted to DEQ. However, DEQ accepted many of the Intel's assumptions without questioning their basis. The ability of DEQ, the public, and Dr. Sahu to assess these assumptions has been further limited by Intel's consistent claims of business confidentiality.[10] Ultimately, the fundamental assumptions that formed the emissions estimates have not been made available to the public, and Intel routinely rejected inquiries for clarity on the technical assumptions that form the basis for emissions calculations.

Given the repeated claims of business confidentiality, it is unclear how Intel reached its emissions calculations. The public is left to wonder how the applicant or DEQ arrived at their conclusions and if those conclusions are supported. This lack of information and justification is problematic, as the assumptions behind Intel's emissions estimates ultimately form the basis for DEQ's determination that the permitted activity will not cause or contribute to the violation of

[7] *See* Exhibit 1 at 2.

[8] This table is also included in Exhibit 1 at page 4.

[9] OAR 340-225-0030(2).

[10] *See, e.g.*, Exhibit 1 at page 3.

National Ambient Air Quality Standards ("NAAQS") or a Prevention of Significant Deterioration ("PDS") increment. Further, this failure to provide essential information to DEQ and the public is contrary to the requirements of OAR 340-225-0030 and public policies that are to facilitate meaningful public involvement in the permitting process. The confidential interests of Intel can still be met, while ensuring that Intel's emissions projections are accurate through the integration of substantial verification measures. In light of the aforementioned deficiencies in Intel's provided information, additional monitoring and verification measures are necessary before the Permit may be issued.

2. DEQ Improperly Bifurcated Cleaner Air Oregon, Climate Protection Program, and Clean Air Act Processes

Cleaner Air Oregon

The Draft Permit contains little to no analysis of the types of air toxics or HAPs that will be emitted during manufacturing processes.[11] Commenters' discussions with Intel surrounding air toxics and emissions inventories to substantiate HAPs PSELs have been largely circular: Intel claims that it will verify compliance with obligations pertaining to air toxics emissions when it goes through the Cleaner Air Oregon Process. This is inappropriate for two reasons: First, Intel and DEQ cannot rely on a state program—CAO—that has not happened yet in order to demonstrate compliance with federal obligations regarding toxic air pollutant emissions. Second, while CAO inventories are eventually integrated into a Title V permit, they are not binding on the permittee until the permittee has been called into the CAO program. This has yet to happen, and the process takes multiple years to complete. Intel cannot rely on a process that is so far in the future to satisfy obligations as they pertain to hazardous air pollutants. With these considerations in mind, Intel cannot collapse future CAO obligations with its existing obligations under the Clean Air Act.

Climate Protection Program

Intel proposes to increase its GHG emissions by 906,560 tons per year, more than doubling the emissions from these facilities. This has major implications for the decarbonization goals of the state of Oregon and for Intel's own stated goal of achieving net-zero greenhouse gas emissions by 2040.[12] The doubling of emissions requires deeper scrutiny from DEQ, particularly as the stated GHG control measures in the permit refer only to current processes and Intel's plans for the facilities include operating as a "foundry" with potential different processes.

The intent of the CPP is to "to reduce greenhouse gas emissions from sources in Oregon, achieve co-benefits from reduced emissions of other air contaminants, and enhance public welfare for Oregon communities, particularly environmental justice communities

[11] *See also*, Exhibit 1 at 3.

[12] Intel Newsroom. April 13, 2022. Intel Commits to Net-Zero Greenhouse Gas Emissions in its Global Operations by 2040. https://www.intel.com/content/www/us/en/newsroom/news/net-zero-greenhouse-gas-emissions-operations.html#gs.542wuj

disproportionately burdened by the effects of climate change and air contamination."[13] While the Oregon Court of Appeals invalidated the rule on a procedural technicality in December 2023,[14] DEQ announced its intention to take the shortest path to reinstating the program by initiating a new rulemaking process,[15] to be completed by the end of the year. There is nothing to suggest that the replacement rules will look different from the CPP.

The CPP rules make Intel's manufacturing facilities covered stationary sources,[16] subject to a Best Available Emissions Reduction ("BAER") assessment within nine months of notice from DEQ. Given DEQ's intention to reinstate the CPP program as quickly as possible, Intel should proceed as though it is subject to the CPP and look to the language of the program for guidance to facilitate a more thorough examination of its GHG emissions and ways to reduce them. Undertaking this process now will help Intel make progress toward its net-zero goals and avoid a duplication of efforts when the reinstated CPP rules take effect. This thorough examination should include future processes that may be included in "foundry" operations as much as possible.

One of the important requirements of the original CPP rules is the "[i]dentification and description of **all** available fuels, processes, equipment, technology, systems, actions, and other strategies, methods, and techniques for reducing covered emissions . . . ."[17] Intel has identified only two feasible Best Available Control Technology ("BACT") methods to reduce GHG emissions from boiler and RCTO operations in this permit application: use of low-carbon fuel and utilization of design and operational efficiency consistent with the manufacturer's specifications.[18] For reduction of GHG emissions from wet scrubbers, Intel identified two technically feasible methods: process chemical optimization and chemical substitution.[19] Intel's analysis provided one technically feasible method for emergency generator and pump operations: use of design and operational energy efficiency consistent with the manufacturer's specifications.[20]

Notably, the permit application states that these are all actions that Intel currently takes; **no new efforts to reduce GHG emissions are being proposed.** Given the significant increase in GHG emissions proposed in this permit application and the fact that these facilities will be subject to the final rules of the CPP, the goal of which is to reduce GHG emissions over time, Intel should be looking beyond its established measures for methods to reduce GHG emissions. Intel has touted that it is making progress toward its net-zero goals through a variety of

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[13] OAR 340-271-0010(3) (invalidated by Northwest Natural Gas Co. v. Environ. Qual. Comm'n, 329 Or. App. 648 (2023)).

[14] Northwest Natural Gas Co. v. Environ. Qual. Comm'n, 329 Or. App. 648 (2023).

[15] State of Oregon Newsroom, *DEQ moves to re-establish the Climate Protection Program in wake of recent court ruling,* (Jan. 22, 2024), https://www.oregon.gov/newsroom/Pages/NewsDetail.aspx?newsid=215174

[16] OAR 340-271-0110(5)(a)(A).

[17] OAR 340-271-0310(2)(c) (emphasis added).

[18] Review Report at 32, Condition 78.d, *see also,* Review Report at 36, Condition 80f.

[19] *Id*. at 38, 81.f

[20] *Id*. at. 40 and 41, 82.g

initiatives, including collaboration across their supply chain.[21] This seems to indicate that it has or will have more options to reduce emissions than the methods that it currently uses. DEQ should require Intel to investigate other options before approving this Permit.

It is imperative that DEQ require compliance with the goals and objectives of CAO and the CPP prior to issuing the Permit. In doing so, Intel and DEQ will avoid duplicative inquiries later down the road while also having the opportunity to assure proactive compliance with Oregon's public health and climate policies.

3. Intel has failed to demonstrate compliance with NAAQS and NESHAPS

The airshed impacted by this permitting process is in attainment. However, Intel's own projected emissions are close to the relevant air quality standards, warranting further verification and review. Both emissions limits—for criteria pollutants, as well as HAPs—are close enough to their respective thresholds that DEQ must impose more stringent regulations. These emissions levels should be closely analyzed and scrutinized. As such, close verification of emissions levels is necessary to make sure that the air shed remains in attainment.

NAAQS

New Source Review ("NSR") programming under the CAA helps to attain and maintain the National Ambient Air Quality Standards by preventing degradation of air quality for those airsheds which are considered to be in attainment with NAAQs. Major sources emitting criteria pollutants in an attainment area are regulated under the Prevention of Significant Deterioration ("PSD") program.[22] Per PSD requirements, a source is required to perform air quality modeling to demonstrate that the facility will not cause or contribute to an exceedance of any applicable NAAQS or air quality increment[23] and install BACT.[24] Pursuant to OAR 340-224-0070, a modified source subject to PSD review must demonstrate that the ambient impacts with the construction and operation of the proposed source, combined with other applicable emissions increases and decreases from existing sources, will not cause or contribute to a violation of any NAAQS or air quality PSD increment. However, Intel's analysis is flawed, and cannot support conclusions required by OAR 340-224-0070(3)(a)(C).

In its own analysis, Intel's NAAQs modeling reveals that multiple criteria pollutants are substantially close to the National Ambient Air Quality Standards.[25] Of particular concern are the PSELs for NO_x (NO_2) and $PM_{2.5}$.[26] For NOx, the NAAQS is 188 ug/m^3. Intel's modeling using EPA Method 163.54 projects a total emissions of 163.54 ug/m^3 while the Monte Carlo Method

[21] Intel Newsroom, *Our Progress Toward Net-Zero Greenhouse Gas Emissions*, (Apr. 18, 2023), https://www.intel.com/content/www/us/en/newsroom/opinion/progress-toward-net-zero-greenhouse-gas-emissions.html

[22] 42 U.S.C. §§ 7470-7479.

[23] EPA, *New Source Review Workshop Manual*, p. C.1 (Oct. 1990 draft); *See* 40 C.F.R. § 52.21(k).

[24] 42 U.S.C. § 7475(a), 7479(3).

[25] Review Report at 56. *See also*, Exhibit 1 at 6.

[26] *Id.*

projects an emissions rate of 170.89 ug/m^3. Commenters point out that Intel's own analysis does not seem to include background emissions rates. This is fundamentally flawed because PSD analysis requires that baseline, existing ambient concentration levels be determined.[27] It is unclear why there are no background rates in the modeling. This is especially troubling considering how close Intel's proposed individual emissions will be to the NAAQS. Given Intel's emissions rates, coupled with the lack of background analysis in the model, DEQ should heavily scrutinize this model and undertake further inquiry as to whether or not Intel's operations will comply with NAAQS for NOx.[28]

Similar deficiencies exist in the $PM_{2.5}$ modeling. While this model does include background analysis, Intel's total proposed $PM_{2.5}$ emissions are close enough to federal limits to warrant further scrutiny. Intel's total annual $PM_{2.5}$ emissions of 8.35 ug/m^3 is nearly 70% of the NAAQS. The EPA has proposed that the annual $PM_{2.5}$ concentration be lowered to a range between 9-10 ug/m^3. Going further, $PM_{2.5}$ monitoring information shows that Washington County actually exceeded the federal fine particulate matter standards in 2011 and 2013.[29] While the area did not surpass the three-year average to trigger a nonattainment designation, the area remains at risk of continuing to exceed the $PM_{2.5}$ standard in the future.[30] Indeed, the potential to violate NAAQS and trigger a nonattainment designation prompted Intel to contribute $250,000 to Washington County's wood stove exchange program.[31] After six years, 606 wood stove exchanges have prevented over 311 tons of particulate matter, pollutants, and gases from entering the airshed.[32] Intel's increased particulate matter emissions frustrate the progress of the wood stove program. The existing thin margin for compliance, the active efforts to maintain attainment for particulate matter criteria, coupled with the aforementioned uncertainties that form the basis of these models underscore that Intel's materials are not sufficient to ensure compliance with state and federal air quality standards.[33] Because Intel has not submitted information necessary for DEQ to make the determination that proposed operations will comply with all NAAQS, DEQ may not issue the ACDP as written.

HAPs

DEQ should scrutinize and verify Intel's purported HAP emission estimates. The CAA regulates the emission of HAPs from stationary sources under the National Emission Standards for Hazardous Air Pollutants ("NESHAPs") program.[34] The CAA defines HAPs as any air pollutant listed under § 112(b) of the CAA.[35] A HAP is a pollutant that is not covered by

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[27] 42 U.S.C. § 7479(4).

[28] Dr. Sahu provides further technical discussion on this matter in Exhibit 1 at 5-7.

[29] DEQ, *Particulate Pollution in Washington County*, at 1, https://www.oregon.gov/deq/FilterDocs/HIllsboroPM2point5QA.pdf

[30] *Id.*

[31] Washington County, Oregon, *Wood Stove Exchange: Year Six Report* (June 2022), *https://www.washingtoncountyor.gov/commdev/documents/wse-year-6-report/download?inline*

[32] *Id.* at 14.

[33] *See also*, Exhibit 1 at 7.

[34] 42 U.S.C. § 7412(a)(6).

[35] 42 U.S.C. § 7412(a)(6).

NAAQs and which "causes or contributes to air pollution that may reasonably be anticipated to result in an increase in mortality or an increase in serious, irreversible or incapacitating illness."[36] The CAA defines a "major source" as "any stationary source or group of stationary sources" that "emits or has the potential to emit considering controls in the aggregate, 10 tons per year or more of any hazardous air pollutant or 25 tons per year or more of any combination of hazardous air pollutants."[37] A minor source or "area source" is a stationary source that emits less than 10 tpy of any individual HAP or less than 25 tpy of all combined HAPs.[38] This distinction is key because major sources of HAPs are required to "maximum achievable control technology" standards ("MACT"), which are more stringent than the minor source counterpart of "generally available control technologies" ("GACT"), the latter of which is less stringent.[39]

Intel's claim to be a minor source for HAPs, which has been largely unsubstantiated, is troubling for three key reasons. First, as articulated above,[40] it is unclear how Intel can substantially increase production *and* emissions of criteria pollutants, without increasing their emissions of HAPs. Absent justification and further verification, DEQ should not accept this conclusion without scrutiny. Second, Intel is only 1 tpy short of being considered a major source, which would implicate more stringent MACT standards.[41] DEQ should not accept such a substantial deviation in regulatory obligations without critical analysis, as it is contrary to state and federal law. Third, the majority of HAP emissions stem from the use of EXSC Scrubbers.[42] Commenters point out that the EXSC Wet Scrubber Conditions contemplate an event of "excess emissions"[43] from these HAP emitting scrubbers. Commenters can imagine a situation where Intel is emitting more than its HAP PSELs and only implementing GACT, which is not sufficient to protect human health. Taking these conditions into consideration, coupled with the fact that Intel claims to only be 1 tpy below the "major source" threshold for combined HAPs, and 1.1 tpy short of an individual HAP,[44] DEQ must verify the HAP emissions claims through bolstered source testing and continuous monitoring obligations.

4. Obligations of the NO_x pilot program should be bolstered

Commenters acknowledge that Intel is engaging in a voluntary pilot to test a NO_x emissions reduction program. However, it is unclear what happens to PSELS if the pilot program fails, as condition 6.b.v of the Draft Permit contemplates a reality that the program may be abandoned.[45] Recognizing that Intel's proposed NO_x concentrations are already significantly

[36] *U.S. v. Walsh,* 783 F.Supp. 546, 552 (W.D. Wash. 1991).

[37] 42 U.S.C. § 7412(a)(1).

[38] 42 U.S.C. § 7412(a)(2).

[39] 42 U.S.C. § 7412(d)(2).

[40] *See* discussion *supra* p. 3.

[41] Commenters also point out that the projected levels for Hydrogen Fluoride, a HAP, are projected at 8.9 tpy, just 1.1 tpy short of the major source threshold for an individual pollutant.

[42] Review Report at 14, see also Exhibit 1 at 4.

[43] Draft Permit at 35 Condition 51.c, 51.d; *see also Id.* at 73 Condition 98

[44] Review Report at 59.

[45] Draft Permit at 5: "Intel is proposing to install and pilot test a new NO_X emissions reduction system…. The proposed system is a "first of kind" system and has not been pilot tested before. If the pilot test is

close to ambient air quality standards, it is unclear how compliance with NAAQS is guaranteed in the event that the pilot fails. Moreover, the language of the Permit gives Intel incredible latitude to abandon the pilot. NO_x emissions pose significant risks to air quality and can exacerbate respiratory issues of surrounding communities. In order for Intel to significantly expand its production in an equitable manner, it is imperative that it is held accountable to fulfill its commitments to pilot initiatives. In light of Intel's considerable contributions to the existing ambient air backgrounds for NO_x, DEQ must ensure that PSELs are accurate even in the event of pilot project failure. Further, DEQ should utilize this opportunity to require stronger measures that will ensure compliance with state and federal law, as well as Oregon's policies to facilitate a just transition and build climate resiliency.

CONCLUSION

For the aforementioned reasons, Commenters have significant questions regarding Intel's PSELs, its modeling analysis, and how Intel's presumptions are sufficient to ensure compliance with state and federal law. DEQ can remedy these defects and ensure that adverse impacts to air quality are avoided by bolstering monitoring and emissions verification obligations. First, DEQ should require continuous monitoring where technically feasible for pollutants, including NOx, CO, VOC, and PM2.5. Second, this data should be made publicly available, and should be accessible so that entities can verify PSEL compliance, and ensure that the actual emissions comply with federal air quality standards. Finally, DEQ should critically evaluate Intel's modeling to ensure that the models do in fact provide a reasonable basis to ensure compliance with air quality standards.

Thank you for your time and consideration.

Sincerely,

Mary Stites, Northwest Environmental Defense Center

Carra Sahler, Green Energy Institute at Lewis & Clark Law School

Mary Peveto, Neighbors for Clean Air

Xitlali Torres, Verde

Sam Diaz, 1000 Friends of Oregon

Jamie Pang, Oregon Environmental Council

Julia DeGraw, Oregon League of Conservation Voters

Lisa Arkin, Beyond Toxics

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successful, Intel may install it on additional exhausts at the facilities covered by the proposed Permit. If unsuccessful, it will be abandoned."

Samantha Hernandez, Oregon Physicians for Social Responsibility

Damon Motz-Storey, Sierra Club Oregon Chapter

Faun Hosey, Robert Bailey, Allen Amabisca, Linda de Boer, Save Helvatia

Exhibit 1

Technical Comments on DEQ's Proposed Permit No. 34-2681-ST-02, R-05 Issued to Intel Corporation, Aloha Campus (Application No. 034907/034188)

by

Dr. Ranajit (Ron) Sahu, Consultant[1]

These comments address some of the more significant technical issues in relation to the proposed Air Contaminant Discharge Permit (ACDP)/Major New Source Review, proposed to be issued by the Oregon DEQ to Intel for modifications at its Ronler Acres and Aloha campuses. These comments do not provide a comprehensive list of all technical deficiencies, including several that have been discussed with DEQ over the last many months.

These comments are based on my review of the publicly available materials, including the permit application, the modeling report, the redacted emissions inventory, as well as DEQ's proposed permit and review report, various discussions with DEQ staff, as well as a site visit and discussions with Intel staff at the RA/Aloha campus. While noting the deficiencies below, which I believe should be addressed in order to make the final permit stronger that what DEQ has proposed, I wanted to express my sincere appreciation to both Intel and the DEQ for the opportunities to have multiple discussions over the last several months.

Introduction

In order to avoid duplication, I will not repeat introductory material in connection with this proposed permit that is readily available in the permit application as well as DEQ's Review Report accompanying this proposed action. However, it is worth noting that the changes that Intel has proposed are substantial and, as a result, the increase in the emissions of various pollutants that will result from the proposed modification are also substantial. I excerpt below Table 4-1 from the permit application. The "difference" column shows the increase in pollutants (in tons/year) as a result of the proposed modifications. While the table below confirms that New Source Review will be triggered for all of the pollutants below, I will focus my comments on the increases in NO_x and $PM_{2.5}$ emissions, as examples, for reasons that I explain later in these comments.

[1] Resume available, if requested.

Table 4-1 Facility Emission Rates (tpy)

Pollutant	Totals[a]	Netting Basis	Difference	SER
PM	78	0	68	25
PM_{10}	69	0	62	15
$PM_{2.5}$	60	0	60	10
CO	598	229	369	100
NO_x as Ozone Precursor	413	197	216	40
NO_x as NO_2 criteria pollutant	413	197	216	40
NO_x as $PM_{2.5}$ Precursor	413	197	216	40
SO_2	36	14	22	40
SO_2 as $PM_{2.5}$ Precursor	36	14	22	40
VOC	351	139	212	40
VOC as Ozone Precursor	351	139	212	40
Fluorides	13	0.5	11.7	3
GHG (CO_2e)[b]	1,722,804	227,000	1,495,804	75,000

[a] Reflects the sum of the emissions (including categorically insignificant activites), rounded up to the nearest whole number (see Table 3-1). Categorically insignificant activity emissions are not included for PSEL computation, but they are included for the determination of PSD applicability (OAR 340-222-0035(5)).

[b] GHG CO2e is in Short Tons

General Comments

1. Intel, as a company, has officially announced that it will operate fundamentally differently in the future (i.e., after the proposed modifications) than in the past. While in the past, Intel has used the RA/Aloha facilities to manufacture semiconductor chips for its own products, Intel has announced that in the future it will function as a "foundry" and make chips not just for its own products but also as a contract manufacturer for other companies.[2]

The relevance of this fundamental change in business purpose and orientation as far as the ACDP is concerned is the fact that, while the permit application makes no mention of this change and simply presumes that future emissions profiles will be similar to those in the past, that presumption needs to be supported and validated. It is not clear, for example, that, operating as a foundry, Intel may need to use different "recipes" and steps in the manufacturing processes, dictated by customer needs, which could be different that Intel's own recipes. Since process emissions and pollutants, as well as emissions from air pollution controls, are fundamentally generated from the use of

[2] See, for example, https://www.bizjournals.com/portland/news/2024/02/21/intel-foundry-microsoft.html

chemicals in the manufacturing processes, changes in the chemical types and mix that can occur, will affect emissions.

There is no reason to therefore simply ignore, as the proposed permitting action has done, this basic change in Intel's business purpose, as the DEQ has done to date. DEQ should forthrightly acknowledge this and discuss the implications and/or limitations of its proposed permit, and how it should therefore strengthen the proposed permit, such as via more comprehensive monitoring than what is currently proposed.

2. The proposed permit only addresses criteria pollutants and greenhouse gas emissions. It does not address the many different types of air toxics or hazardous air pollutants (HAP) that will also be emitted as a result of the modification. Other than noting, without support, what such HAP emissions will be in the future, there is no further analysis of the implications of these HAP emissions as far as risks to the public.

DEQ has noted that Intel is expected to be "called in" to address its HAP emissions and resulting risks under the separate Cleaner Air Oregon program. However, the timing of this CAO process is not certain or defined at this time.

It is a mistake to artificially bifurcate, for bureaucratic reasons (i.e., the CAO program is separate from the ACDP program), permitting decisions for some pollutants (i.e., criteria and GHGs) in the current action and defer analysis and action on the HAPs till a later, uncertain, date. The nature and sources of emissions and emission factors that underlie HAP emissions (and their deficiencies), are also related to, and affect emissions of criteria and GHG pollutants. To the extent that HAP emissions may need to be reduced to reduce risks, additional process changes and/or the need to add additional air pollution controls, are best addressed comprehensively, and not on a piecemeal basis.

Specific Comments

3. As a result of Intel's claims regarding business confidentiality, the fundamental bases of the emissions estimates summarized in the excerpted table above are not publicly available. While Intel attempted to address this via one-on-one discussions about the bases of the emissions calculations, and how they relate to the underlying processes at Intel's operations, it should be made clear that Intel could not and did not provide any clarity for the technical assumptions that underlie its emissions calculations. Its use of certain emission factors (i.e., mass of pollutants per unit of production) remain opaque even after all of the discussions – both to the public and to DEQ. DEQ participated in the one-on-one discussions and asked for the same level of clarity about emission factors and Intel could not or chose not to provide that clarity.

It is clear that the DEQ has based its proposed permit on what is presented in the permit application, without any ability to understand the basis for the emissions presented. The emissions are therefore unsupported.

There is only one logical recourse as a result. That is to include substantial verification – i.e., emissions measurements and testing – such that, mindful of the confidentiality needs of Intel, the public can still verify the actual levels of pollutants that are emitted at Intel's plant.

Table Sahu-1 below, taken from Intel's own emissions detail sheet, shows the PSEL summaries for NO_x, CO, VOC, $PM_{2.5}$, Fluorides, and HAPs, from the various sources of these pollutants, along with the percentages of the total (for each pollutant) contributed by various sources.

Table Sahu-1: Intel's PSEL Breakdown and Major Sources Contributing to Respective PSELs

RA and Aloha PSEL Summary (tpy)	NOx		CO		VOC		PM	PM10	PM2.5		Fluorides		HAPs	
Boilers	19.69	4.8%	58.64	9.8%	8.55	2.4%	3.89	3.89	3.89	6.6%	-		0.14	0.7%
EGENs	52.46	12.7%	4.28	0.7%	0.96	0.3%	0.48	0.48	0.48	0.8%	-		0.35	1.7%
RCTOs	80.73	19.6%	106.28	17.8%	150.01	42.8%	19.05	19.05	19.05	32.2%	0.002	0.0%	0.13	0.6%
EXSC Scrubbers	192.68	46.7%	327.92	54.8%	36.92	10.5%	28.11	27.17	25.65	43.3%	12.13	97.0%	17.47	84.6%
EXAM Scrubbers	43.45	10.5%	81.51	13.6%	86.51	24.7%	13.55	8.54	8.27	14.0%	0.04	0.3%	0.04	0.2%
PSSS Scrubbers	-		-		-		0.71	0.44	0	0.0%	-		-	
Fugitive VOCs	-		-		65.82	18.8%	-	-	-		-		-	
Heaters	10.41	2.5%	17.13	2.9%	0.57	0.2%	0.26	0.26	0.26	0.4%	-		0.02	0.1%
TMXW	12.23	3.0%	1.1	0.2%	0.2	0.1%	0.09	0.09	0.09	0.2%	-		0.004	0.0%
Lime Silos	-		-		-		0.44	0.44	0.44	0.7%	-		-	
Cooling Towers	-		-		-		8.81	7.19	0.03	0.1%	-		-	
Aggregate Insignificant Activities	1	0.2%	1	0.2%	1	0.3%	1	1	1	1.7%	0.3	2.4%	2.5	12.1%
Paved Road Emissions	-		-		-		0.75	0.15	0.04	0.1%	-		-	
Total	**412.64**		**597.86**		**350.54**		**77.16**	**68.71**	**59.21**		**12.5**		**20.65**	
Current PSEL	197		229		178		41	35	31		6		24	
Requested PSEL	413		598		351		68	62	60		12.5		24	
% Increase Requested	*110%*		*161%*		*97%*		*66%*	*77%*	*94%*		*108%*		*0%*	
		89.5%		96.1%		78.0%				89.5%		97.0%		84.6%

The yellow highlighted items, for each pollutant, show the major contributors to that pollutant, with the sums of just the yellow-highlighted contributions tallied in the last row. Thus, 89.5% of the NO_x PSEL is from just four source types – the EGENs (emergency generators), at 12.7%; the RCTOs (Rotor Concentrator Thermal Oxidizers, a type of VOC destruction device), at 19.6%; the EXSC (acid scrubbers), at 46.7%; and the EXAM (ammonia scrubbers), at 10.5%. Of these, just the EXSC scrubbers account for almost 193 tons/year of NO_x.

Table Sahu-1 confirms that the majority of each pollutant is emitted by a small number of sources. Sahu-1 also shows two items in orange highlighting – these reflect the high contribution of fugitive emissions to the VOC PSEL and the high contribution of aggregate insignificant activities to the HAP PSEL. While the latter may simply be an artifact (based on unsupported assumptions that aggregate insignificant HAPs are 2.5 tons/year, the fugitive VOCs are substantial.

The purpose of Table Sahu-1 is to prioritize those source/pollutant combinations that need extra scrutiny, both from an emissions estimation as well as verification purpose. Since, as noted prior, Intel cannot or will not provide support for its emissions estimates, based on confidentiality, it is

only logical that the proposed permit focus on verification (i.e., testing, monitoring, etc.) to provide assurances that the emissions estimated are not erroneous.

While in a perfect scenario, all sources would be monitored for all pollutants, on a continuous basis, I recognize that that is impractical. Therefore, Table Sahu-1 provide a roadmap to monitor just the yellow-highlighted sources for each pollutant.

Specifically, the monitoring should be based on the following hierarchy: (i) first, if continuous monitoring (i.e., CEMS) is technically feasible – as is the case for NO_x, CO, VOC, and filterable $PM_{2.5}$, that should be the first choice – for each (or a representative number of) emission point(s) associated with the yellow-highlighted line items and (ii) next, only if CEMS are not feasible, such as for condensable $PM_{2.5}$, fluorides, HAPs – then periodic testing should be required at each or a representative number of emission points under representative process conditions.[3] For the orange-highlighted items, DEQ should require a better estimate for the HAP place-holder and DEQ should require Intel to support its fugitive VOC estimate either by periodic testing or mass-balance or some other approach that is technically sound.

Sadly, the proposed permit does not contain anywhere close to the type of testing/verification that is minimally appropriate, given the complete lack of basis/support/transparency for the PSEL values shown in excerpted Table 4-1 shown earlier or Table Sahu-1 above.

4. The need for robust monitoring is made clear by the example of the 193 tons/year of NO_x PSEL from the EXSC scrubbers. Till this application was provided, the DEQ had no idea that the EXSC scrubbers were NO_x sources to begin with. That was based on the assumption that these scrubbers are air pollution control devices to remove primarily VOCs (and also certain particulates) using an acidic scrubbant liquid. They are not combustion devices and therefore ordinarily would produce no NO_x. It became clear, in discussions with Intel, that the NO_x is present in the exhaust gases routed to these EXSC scrubbers and that NO_x originates from hundreds of individual point-of-use abatement devices (combustion devices) scattered throughout Intel's operations. To date, Intel has not provided any further details about these hundreds of devices, their NO_x emissions calculation methodology, or any other process details. Thus, the public (and DEQ) have no idea how the 193 tons/year of NO_x PSEL from the EXSC scrubbers was developed, other than to simply accept Intel's representation that that is the case.

This is untenable, and is a prime example of why DEQ needs to require Intel to install NO_x CEMS at the exhaust of each EXSC scrubber (or groups of such exhausts, where they are commonly

[3] Given Intel's penchant for secrecy, establishing representativeness of underlying process conditions (i.e., the sources and origin of the pollutants from the manufacturing processes themselves) is a fraught exercise – and not reliable. This is not to accuse Intel of any nefarious intent, but to simply recognize the fact that the public (and DEQ) simply has no idea if the underlying process is running in a representative or normal fashion during a scheduled periodic stack test. For this reason, the use of CEMS is essential, and stack testing is only a last resort if CEMS are simply not technically feasible.

routed to the atmosphere). These CEMS data should be publicly available and, over time, can provide clarity on the appropriateness of the now-hidden NO_x emission factors Intel has used in developing its emissions estimate. The NO_x CEMS will also provide data on the variability of the NO_x emissions over time, from the EXSC scrubbers – something that cannot be ascertained by doing periodic stack testing, under process conditions that Intel alone controls, with no transparency about the representativeness of any test conditions.

5. I have noted previously that NO_x and $PM_{2.5}$ are especially important. The reason for this is clear when one reviews the results of air dispersion modeling provided by Intel itself. Below, I have excerpted (except the notes following the table), Table 18 from the modeling report, with a couple of red-box highlights.

Table 18
Intel Facility Sources (New+Existing) Modeling Results

Pollutant	Averaging Period	Modeled Concentration (µg/m³)	Background (µg/m³)	Total (µg/m³)	National Ambient Air Quality Standards (µg/m³)
NO_2	1-hr 5-yr Avg of 98th%	EPA Method 163.54 [a]	-	163.54	188
	1-hr 5-yr Avg of 98th%	Monte Carlo 170.89 [b]	-	170.89	188
	Annual Max	13.25	35.6	48.85	100
SO_2	1-hr 5-yr Avg of 99th%	39.97	7.0	46.97	196
	24-hr Avg	18.38	4.7	23.08	1,300
	Annual Max	3.83	1.1	4.93	80
PM-10	24-hour H6H	7.78	39.0	46.78	150
PM-2.5[c]	24-hr 5-yr Avg of 98th%	4.50	20.7	25.38	35
	5-yr Avg of Ann Conc's	1.73	6.6	8.35	12.0

First, it is clear that for NO_x (NO_2), the results of the modeling show that depending on the approach used, the total NO_x (i.e., 163.54 – 170.89 ug/m^3) is remarkably close to the NAAQS of 188 ug/m^3 (i.e., even the lower part of the range is 87% of the NAAQS). Similarly, for $PM_{2.5}$, the annual total $PM_{2.5}$ concentration of 8.35 ug/m^3 is already almost 70% of the NAAQS. In fact, EPA

has proposed that the annual $PM_{2.5}$ NAAQS be lowered to a range of between 9-10 ug/m^3.[4] If the revised NAAQS is set at 10 ug/m^3, the total $PM_{2.5}$ annual value, per Intel's own analysis will be 83.5% of the new NAAQS. If the revised NAAQS is set at 9 ug/m^3, Intel's total $PM_{2.5}$ impact will be almost 93% of the new NAAQS. These thin margins for potentially exceeding the NO_x (1-hour) and $PM_{2.5}$ (annual) NAAQS warrant extra care and consideration, beginning with not just the emissions estimates (alluded to previously) but also additional verification.

To that end, first, I reiterate that, since Intel refuses to provide any support for its emissions estimates, DEQ has to include far more robust source monitoring (i.e., CEMS for NO_x and filterable $PM_{2.5}$, plus frequent stack testing for condensable $PM_{2.5}$) – for all NO_x and $PM_{2.5}$ sources.

Second, specifically for NO_x, Intel has conducted a Monte-Carlo analysis for its engine (EGEN) emissions, which as Table Sahu-1 shows do, collectively, contribute substantially (at 12.7% of the NO_x PSEL). But that Monte Carlo analysis makes a number of assumptions about engine (or engine group) operating hours, and times – with no support. Yet, since most of these engines already exist, DEQ should provide factual data from historic engine operations (and modified by expected future changes, if needed) to support this analysis. It has not done so.

Third, and glaringly, DEQ is aware that Intel's cumulative analysis (required since Intel's own impacts exceed regulatory thresholds) of its NO_x emissions, by taking into account other NO_x emitters present nearby, does not include additional emergency engines, which have been permitted but have not yet begin operation (or had begun operation when the modeling was conducted in 2022). Since these engines will be operating by 2026, when Intel's proposed modifications occur, there is no rational basis, whatsoever, to exclude these additional, known sources of NO_x emissions – especially given the already thin margin for NAAQS compliance.

Fourth, Intel's $PM_{2.5}$ emissions estimates are not only weak as a result of Intel's claim of confidentiality, but, in addition, due to dubious assumptions. As an example, Intel simply uses an emission factor for PM (and its fractions) for combustion based on prior DEQ approval, but no one (including DEQ) could confirm if that emission factor is accurate or not. I ask the DEQ to specifically address the accuracy (and the basis) of the combustion PM (and $PM_{2.5}$) emission factor since Intel has relied on DEQ's approved factor.[5] As another example, Intel assumes, with no basis at all, that the speciation (i.e., size fractions) of PM, including $PM_{2.5}$ from its EXSC scrubbers is the same as that from cooling towers. While there is a single technical paper that forms the basis

[4] https://www.epa.gov/pm-pollution/proposed-decision-reconsideration-national-ambient-air-quality-standards-particulate

[5] I note that the emission factor that Intel uses might in fact be only for filterable $PM_{2.5}$ and exclude all condensable $PM_{2.5}$, but it is not clear. I ask DEQ to provide a transparent record on this.

of the cooling tower $PM_{2.5}$ fraction, there is no technical basis that the same technical paper can also support the $PM_{2.5}$ fraction from the EXSC scrubbers.

Collectively, I have pointed to examples of significant issues with the NO_x and $PM_{2.5}$ emissions that DEQ needs to address, given the small margin for NAAQS non-compliance of these two pollutants.

6. In an attempt to address the potential NAAQS non-compliance, the proposed permit suggest some ambient monitoring. While ambient monitoring can provide useful data, DEQ should explain how its proposed ambient monitoring (at just a few locations), can provide reliable data to discern potential NAAQS violations, at least for NO_x and $PM_{2.5}$, given their small margins to not exceed their respective NAAQS, now and in the future (for $PM_{2.5}$, as noted prior).