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Please see attached file for my comments.

Comments to MPCA Regarding its Draft Metropolitan Waste Management Plan and its Disturbing Lack of Scientific Risk Assessment

- Doug Gurian-Sherman, Ph.D., Minneapolis, MN

My comments focus on some of the most important aspects of the draft report: The lack of scientific findings about waste management and some of the serious implications of that absence. The scientific basis for Minnesota Pollution Control Agency (MPCA) policy recommendations must be part of the foundation of MPCA's positions. Without providing the science behind its decisions, the report's recommendations seek to lock the Twin Cities metro area into a waste management plan for 20 years by bureaucratic fiat. This would have substantial harmful implications for public health and the environment, including climate change and environmental justice. This process flies in the face of basic democratic principles of an open and democratic government. It is contrary to good science and risk assessment.

The available science, despite limitations, strongly supports closing the Hennepin Energy Recovery Center (HERC) as soon as possible to protect public health and the environment from *unnecessary* harm. Therefore, given its severe failures, the report must be drastically revised to include detailed and thorough scientific risk assessment research and new recommendations:

- 1) MPCA must reverse its position and recommend closing HERC, which is supported by risk science research. The science literature and available monitoring data show that incineration, even when using pollution control equipment, is harmful to nearby residents. Regardless of MPCA's policy recommendations the revised report must show, using a thorough and unbiased assessment of available science, why the MPCA makes its recommendations concerning the Hennepin Energy Recovery Center (HERC) trash incinerator and other parts of the waste hierarchy.
- 2) The current draft ignores environmental justice (EJ) because MPCA's policy recommendations merely state EJ principles but do not provide any risk assessment that takes those principles into account. As such MPCA's comments about EJ are entirely hollow and devoid of substance. Communities already overburdened by high levels of pollutants from other sources should not be subjected to pollution from incineration.
- 3) Current risk assessment does not support MPCA's extreme interpretation of the waste hierarchy. MPCA must explain, using science, why it supports an interpretation of the waste hierarchy of the 1980 Waste Management Act that would require HERC not only to remain open, but also run at full capacity while landfill waste is reduced, contrary to protecting public health.
- 4) MPCA must explain why it believes that anyone should take its supposed commitment to either environmental justice, climate change mitigation, or prevention of environmental harm seriously when its goals to implement widely agreed upon best waste management practices (reduce, reuse, recycle) are so anemic. This is despite much more ambitious goals and accomplishments by other jurisdictions in the US and elsewhere which demonstrate that much more ambitious goals can be accomplished.
- 5) If MPCA is not willing to recommend closing HERC as soon as possible, it should empower an independent scientific body, using US EPA's Scientific Advisory Board and Scientific Advisory

Panels as a model, to evaluate the risk science concerning the HERC. This must be in meaningful conjunction with the most affected communities, to make binding recommendations about the HERC's fate. Community members most affected by HERC must be members of the panel and involved in the panel selection process to ensure that unbiased members are chosen and to support community trust.

6) In the meantime, MPCA must recommend to the State Legislature that the waste hierarchy be revised to acknowledge that both incineration and landfills are harmful, and both should be phased out to the extent possible in favor of a more ambitious implementation of the widely accepted best practices of the current waste hierarchy—reduce, reuse, and recycle. Landfill reduction should not have priority over incinerator closure. And since it is possible to close HERC, MPCA should recommend that this be done as soon as possible.

Given the need to write a new report, MPCA must open a new comment period, which should be for 120 days to allow adequate public participation.

The draft report is selective in a misrepresentative way regarding which parts of relevant statutes are emphasized or ignored, as well as its extreme interpretation of current legislation. This includes ignoring legislative opportunities and requirements for reporting to the legislature. The current lack of any substantive application of MPCA's environmental justice responsibilities amounts to an insult to environmental justice communities and residents near the HERC site and to all people in the State. This amounts to a kind of *de facto* structural racism that Minnesota has rightly become infamous for nationally.

MPCA should also not attempt to evade its current responsibilities concerning waste management, public health and environmental justice while working on cumulative risk regulations under recent State legislation, which may take several years and meanwhile lock Minneapolis residents into continuing harm. The harmful realities on the ground do not wait for unfeeling bureaucracies' glacial-paced advancements. Although robust cumulative risk assessment, better analysis, and better monitoring is needed and likely to show that harm to nearby residents is greater than older risk assessments, these are not necessary to establish harm that supports closing HERC.

It is not clear why MPCA believes that it can write a report devoid of risk assessment science, even though such science is fundamental to supporting its recommendations. The most generous interpretation is that MPCA did not believe that this was necessary or desired by the public. But MPCA cannot claim to follow science in its decision making while ignoring it when it comes to this report, the HERC and other incinerators, and the waste management hierarchy. Regardless of whether MPCA considers it legally supportable to provide such an inadequate report, it has an opportunity to do what is right. As such, regardless of its possible past reasons, it has a moral, environmental, scientific, public health, and environmental justice responsibility to rectify this now.

Now that MPCA has been made aware of the huge inadequacies of its draft report, it has no excuse but to correct the harmful precedents it sets. If it follows its current path, it will rightly lose credibility and further harm public confidence in democracy and thereby harm all of us beyond the issues of waste management. This will reflect badly on the Minnesota Executive Branch and government more generally.

For the reasons laid out above, the report is fundamentally flawed, and must be extensively re-written if the agency is to be taken seriously as a science based and democratic institution concerned about public health and the environment and environmental justice, which are issues of the utmost importance to people of the State of MN. It is the moral and legal imperative of the agency and the authors of this report to act in the best interest of the State's citizens. Anything else is an abrogation of its responsibilities. The following points summarize the flaws in the report that must be revisited:

1) MPCA Provides no Scientific Basis for Keeping HERC Open, Despite Harm it is Causing to the Health of Minneapolis and Other Minnesota Residents and the Environment

The Minnesota Waste Management Act, MN Section 155A.02(a) and (b), in its declaration of policy purposes names both protecting public health and the environment.ⁱ In section (b) this is prior to describing the law's waste hierarchy. To protect public health and the environment, the sciences of risk assessment must be applied to determine, to the extent possible, the potential or actual harm from the various methods of managing or reducing waste. Sciences such as toxicology and epidemiology are primary accepted means of performing these assessments, and there is peer-reviewed science literature on these topics pertaining to waste management.

Furthermore, there is preliminary risk assessment using US Environmental Protection Agency's COBRA tool that determines at least several deaths are likely due to the operation of HERC.ⁱⁱ As the reference notes, while the COBRA tool assesses statewide mortality, it is likely that the *rate* of harm would be much higher in the HERC's local vicinity than statewide. MPCA contradicts its mandate to protect the public health when it supports the continued operation of the HERC.

Furthermore, HERC produces large amounts of ash enriched with highly toxic and persistent substances that include, but are not limited to, extremely toxic dioxins and furans which are created *de novo* through the combustion process when chlorine is present and PFAS compounds which usually are not monitored. Ash also contains toxic heavy metals. Ash from municipal incinerators often amounts to roughly 20-30 percent of the original waste. But even if lower amounts are produced, ash makes up a substantial portion of the original waste that was incinerated and is a toxic legacy of incineration beyond that of the waste prior to incineration. Section 115.02(a) lists priorities for waste management, beginning with reducing the amount of toxic waste *generated*. HERC is one of the largest generators of dioxins and furans in the state, yet MPCA seems completely accepting of this. It is also important to note that pollution control equipment at HERC does not eliminate these toxins, but only captures a portion of them. That which does not end up in the nearby community via air emissions which are still considerable, ends up disposed of in landfills. MPCA has expressed concern with selective "legacy" environmental issues concerning landfills yet seems unconcerned with toxic ash even though it is disposed of in those landfills. MPCA's proposals largely ignore this toxic waste and the statutory requirement to reduce the generation of toxic waste.¹

¹ MN Section 115A.02(a).

This is also despite the legal requirement in the Waste Management Act to reduce both the toxicity and quantity of incinerator waste to the maximum extent feasible and prudent.² Running the HERC and other incinerators at full capacity for the next 20 years, as the MPCA insists, contradicts this mandate and is therefore contrary to the intent of the legislation. The most effective way to reduce this ash is to reduce the amount of waste incinerated and close HERC and other incinerators. Where there are contradictions, confusion, or tensions between the several laws involving waste management, MPCA must use its statutory responsibility to recommend legislative changes to follow the science. It must use that mandate to rectify the harmful policy of maximizing incinerator loads. And it must recommend revision of the waste hierarchy that from a public health, environmental justice, and environmental perspectives is currently defective. In short, it must say that municipal incineration is not a positive way to reduce waste and is in fact harmful.

In summary, for MPCA to justify its policy recommendations, it must produce a thorough assessment of the risks associated with those recommendations. Yet, as noted, there is no science presented in the draft report.³ Appendix D, which the report refers to for its science assessment and MPCA's preference of incineration over landfills, presents no science and does not even mention public health. It also repeatedly notes that there is inadequate data to compare risk between landfills and incineration. Without such risk assessment, MPCA's recommendations are nothing but the unsupported opinion of the authors and the agency.

Additionally, *risk assessment science depends on transparency*. This is revealed through the centrality of the peer-reviewed literature process in all science fields, as well as other public venues such as meetings and conferences. Such transparency is especially important for regulatory agencies that are supposed to represent the public's interests in a democracy. The lack of communication of any risk assessment science, let alone a thorough risk assessment in the draft report, flies in the face of the responsibility of a supposedly science-based agency. And it harms the agency's legitimacy and public trust. In the case of this draft report, this is doubly harmful because the HERC is in and surrounded by environmental justice communities that are burdened by centuries of prejudice and harm, including from sources of pollution. Therefore, even if MPCA believes that it has science support for its recommendations, the lack of transparency of this hypothetical information makes it useless for fulfilling the agency's responsibilities.

It is important to note that MPCA has a responsibility to present a thorough risk assessment even though there are apparent legal requirements in Minnesota to continue to run municipal incinerators. This is because, as noted above, the only way to establish policies that obey Section 115.02 concerning protecting public health and the environment is through a thorough presentation of the risk assessment science, and there is nothing in the waste management act or the law requiring MPCA to report to the State legislature that prevents or discourages such an assessment. Therefore, both science, section 115.02, and the moral and ethical responsibilities of MPCA require that it establish its recommendations through risk assessment science.

² MN Section 115A.97 Special Waste; Incinerator Ash, Subd 1. See also MN Section 473.149 Subd 2d.

³ There is one link in Appendix D purporting to provide some of this, but it is apparently not functional, and based on the descriptive text accompanying that link, it appears to refer to limited science.

MPCA must present a full science-based assessment to support its policy recommendations, not merely pick and choose research that supports its conclusions. It must cite the studies performed by or for MPCA and in the science literature and explain how they support or contradict MPCA's recommendations. It must present peer-reviewed studies that may exist that contradict MPCA's positions, as any good science does. Importantly, it must also present accepted statistical analyses of variability and uncertainty in the data and research it uses.

A key part of the data MPCA must produce concerns monitoring of pollutants. HERC is known to be the largest or near largest stationary source of several criterion pollutants such as nitrogen oxides, sulfur dioxide, particulates such as PM 2.5, carbon monoxide, hydrochloric acid and toxins such as dioxins, furans and heavy metals in the Twin Cities metro area and the state. How, when and where measurements of these pollutants are made is critically important. If not done in a way that accurately determines emissions and their concentration and amounts in the environment, reported emissions may be substantially inaccurate and thereby misrepresent the harm to residents and the environment.

2) The MPCA Draft Report States the Importance of Environmental Justice (EJ) But Does Nothing to Show How It is Addressing EJ in Its Report.

The draft report describes in general terms what environmental justice is, and its importance, especially in Appendix B, but does nothing to address this important concern. It presents no risk assessment science research or data showing how it is addressing legitimate and well documented EJ concerns for the communities immediately surrounding the HERC. This makes a mockery of the supposed concern of MPCA for EJ and contradicts the State's concern about rectifying EJ issues.

In case MPCA intends to deflect legitimate resident concerns by defaulting to its cumulative impact rulemaking, that ongoing process in response to recent State legislation is no excuse for delaying appropriate action concerning HERC, which would amount to ignoring the realities on the ground to the continuing harm of Minneapolis and County residents. MPCA is tasked with producing its waste management report now, not after its cumulative impact rulemaking. And its current draft report would lock communities into continuing harm for at least six years, until the next report, or 20 years as recommended in the current report.

It is of particular importance for MPCA to show not only data on pollutants from HERC, but also to evaluate them in the context of the already high environmental and social and health burdens of the communities in the HERC's immediate vicinity. This necessitates robust *cumulative* risk assessment to the extent possible.

Cumulative risk assessment must include potential harm from chronic exposure to multiple pollutants and other stressors such as infectious and chronic disease, and their interactions. There is evidence that such interactions may substantially increase risk above what would be determined by listing harm from pollutants individually, or even simply adding their individual harm. This is because such harm may be expressed non-linearly as a function of increasing exposure or may exceed thresholds whereby harm may increase exponentially only at higher levels of cumulative exposure.ⁱⁱⁱ Some pollutants may lower thresholds for other pollutants, and there may also be synergistic effects between pollutants (there may

also be antagonistic effects between pollutants). These harmful synergistic effects may occur at exposure levels below accepted regulatory toxicity levels.^{iv} This is especially important in areas, such as near the HERC, that already have high environmental burdens since cumulative effects are more likely in these circumstances.

Therefore, MPCA should state whether and how it is using cumulative risk assessment, or whether it is merely determining the individual harms from pollutants or summing those individual harms.

Some have suggested that because high levels from mobile sources such as cars and trucks already exist in the district where the HERC is found, the pollution from HERC and its harm to the public should be ignored. But in addition to ignoring the findings of cumulative risk science, this uses the racist history of the intentional placement of highways and other major roadways and industrial facilities in BIPOC communities. In effect, it uses historic racism as a way of trying to dismiss harm to these communities.

What some mistakenly characterize as *acceptable* low levels of mortality or morbidity caused by the HERC under current inadequate risk assessment, without the consent or agreement of the most affected residents, devalues the lives of the majority BIPOC and poor residents living closest to the HERC.

Instead, EJ demands that the exact opposite response should be taken. It emphasizes the responsibility of MPCA to do everything possible, such as closing the HERC, to reduce harm to these communities. The callous response of MPCA and its leadership in dismissing harm to health from HERC is in effect, therefore, an expression of *de facto* structural racism. If MPCA claims not to have considered this perspective in its draft report, it now has no excuse for ignoring it.

Increasing evidence supports cumulative risk assessment as more accurate than determining only separate risks from individual pollutants, which is the way risk has been assessed historically. But cumulative risk assessment is also very complex because of the large number of combinations of pollutants and other stressors that are involved. Cumulative risk assessment is in the relatively early stages of development. For this reason, *complete* cumulative risk assessments cannot yet be done. This does not absolve agencies like MPCA from doing as much as they can, however. How should the limitations on the current ability to do thorough cumulative risk assessment be considered?

Given the historic harm to EJ communities, the State has a particularly high responsibility to err on the side of protection, where technical limitations and uncertainty occurs. This strongly suggests that a ***precautionary approach*** should be taken concerning EJ communities. The need for precaution was also noted in a recent systematic review of epidemiological studies of municipal incinerators that found numerous associations between them and elevated harm to nearby residents. That research also noted that while newer incinerators with state-of-the-art pollution control equipment may have lower emissions of pollutants, it cannot be claimed that they are safe and a precautionary approach to protect the public should be taken.^v

Precaution is strongly supported by the reasonable likelihood of synergistic and other non-linear toxicity effects between pollutants. These considerations mean that current acceptable exposure levels may substantially underestimate harm. It should be noted that standards for Minnesota solid waste facilities

“...shall be *at least as stringent* as the guidelines, regulations, and standards of the federal Environmental Protection Agency” [emphasis added].⁴ In other words, the legislature has stated that MPCA can recommend policies that exceed US EPA exposure standards. And given the known harms, high pollutant exposure in EJ communities of Minneapolis, and uncertainties concerning cumulative risk, MPCA has both the authority and ethical responsibility to follow a precautionary approach and recommend the closing of the HERC and other municipal incinerators as soon as possible.

This also means that harm that has already been identified is unacceptable. There is no acceptable justification for keeping the HERC open. The State rightly no longer considers waste incineration to be renewable energy. Incineration is not a positive climate heating solution, harms public health and the environment, and there are other much better solutions for waste management.

MPCA should acknowledge that cumulative harm could easily be greater than what assessments based on individual pollutants suggest. Instead of promoting policies that act only on the clearly inadequate and limited risks from individual non-interacting pollutants, which is known to be inaccurate, MPCA should propose policies that would protect against potential cumulative harm. It should value public health, the environment, and EJ above whatever minor benefits it believes incineration provides, and for which better solutions exist in any case. The alternative of waiting years or decades for more definitive data, which may be accompanied by considerably higher mortality and morbidity than current risk assessment would show, would be highly irresponsible. We have more than enough historical examples of governments ignoring early warnings of harm from toxic substance to the great detriment of society that there can be no excuse to ignore a precautionary approach to risk assessment in the case of the HERC.^{vi} Additionally, taking a precautionary approach to HERC would also be a way to address the fact that MPCA is in the process of rulemaking on cumulative impacts by allowing uncertainty in the current process to work in favor of protecting public health rather than against it. It also means that HERC must be closed as soon as possible.

3) MPCA’s Extreme Interpretation of the Waste Hierarchy, demanding that the HERC run at Full Capacity Through at Least 2042, is Not Supported by Any Science in the Report and is Therefore Based on Mere Conjecture as Reported.

Taking an entirely one-sided approach by insisting that HERC run at full capacity even as landfill use is reduced must logically and morally be supported by similarly one-sided risk assessment. Yet there is nothing resembling this. Furthermore, Appendix D of the draft report repeatedly states that there is not adequate data for comparing the risks of landfills and incineration. Given that, MPCA seems almost obsessed about forcing municipalities to continue to run incinerators at full capacity to the detriment of its residents.

Despite statutory requirements to follow this course, MPCA has another option. In fact, the statute that requires this report to the legislature also *requires MPCA to recommend statutory changes to the legislature as needed*.⁵ If MPCA followed the risk science they would acknowledge that incinerators are harmful, as are landfills. HERC causes harm to nearby residents, produces greenhouse gasses and toxic

⁴ MN Section 473.149 Subd 1.

⁵ MN Section 473.149 Subd 6.

and harmful emissions, and produces toxic ash that is then disposed of in landfills. Its energy production must be replaced by truly renewable sources. Therefore, MPCA must, based on risk science, recommend that the State legislature amend the Waste Management Act to acknowledge that both incineration and current landfills are harmful, and both should be reduced and eliminated to the extent possible.

4) MPCA's Supposed Commitment to Mitigating Climate Change or Avoiding Legacy Environmental Problems Cannot be Taken Seriously Based on its Draft Report.

MPCA must recommend a much more ambitious effort to reduce, reuse and recycle to reduce landfills and close harmful incinerators. Instead MPCA set a pathetic goal of a 5% increase in recycling in 20 years. This clearly shows that MPCA is not serious about climate change, protecting public health, the environment, or environmental justice.⁶

MPCA is rightly concerned about legacy methane emissions from landfills, but again, this could and must be largely remedied by more aggressive composting or anerobic digestion of organics and reduction of food waste which are the source of these emissions, and for which current programs set a good example that could be greatly expanded.

Additionally, the toxic ash they produce is a legacy harm for long after an incinerator is closed, as noted above, as is pollution of soil surround the HERC site, but which MPCA seems to ignore, contrary to legal reporting requirements.

5) MPCA Should Empower a Science Advisory Committee, Similar to Those Routinely Used by US EPA to Advise it on Challenging Issues

Although it is clear based on the arguments and information discussed above that the HERC must be closed as soon as possible to protect both the public health and the environment from unnecessary harm, MPCA has argued based on no presented science that it should not only remain open, but function at its highest capacity for at least the next 20 years. The major disagreement between the communities most harmed by HERC and the MPCA make this issue ripe for advice from a reputable source from the science community.⁷

The US Environmental Protection Agency's (EPA) Scientific Advisory Board and Scientific Advisory Committees are intended for similar situations.^{vii} That model also has built in important conflict-of-interest prevention provisions, such as not allowing in most cases experts that have a self-interest in

⁶ As did it MPCA's permitting of the Line 3 pipeline, which greatly increases greenhouse gas emissions by extending and expanding tar sands oil production and delivery, destruction of habitat including large aquifer disruptions, ignoring of treaty rights, and likely subjecting the state to future destructive oil spills based on the terrible record of the pipeline owner, Enbridge, and pipelines generally.

⁷ The science is an important aspect of this decision making, but the agency of the communities most affected by the harm from HERC is even more important. A thorough science assessment could also help those communities in their own decision making.

parties to the issue, such as receiving funding from them. MPCA should request any needed authority to convene such as body from the state legislature as needed.

However, the EPA's process has several limitations concerning environmental justice. First, it contains only science (including social science) experts and does not include people from the most affected communities.⁸ This should be remedied. Second, the community members should have decision-making authority in all aspects of the process, including the selection of committee members and should participate in all meetings and participate in authoring a report.

If MPCA continues down its current path of forcing the HERC to remain open through its heavy-handed and unilateral process, against an already overburdened community's wishes, it will further harm public trust in the government and increase social tensions in addition to continuing to harm the community.

6) In the Meantime, MPCA Should Recommend to the State Legislature that the Waste Hierarchy Must be Revised, and a New Public Comment Period Opened.

This revision must acknowledge that both incineration and landfills are harmful, and both should be phased out to the extent possible in favor of a more ambitious implementation of the widely accepted best practices of the current waste hierarchy. Landfill reduction should not have priority over incinerator closure. And since it is possible to close HERC, MPCA should recommend that this be done as soon as possible.

Given the need for what amounts to a new report MPCA must open a new public comment period of 120 days after a new draft is finished.

Conclusions

Data and current models, despite likely underreporting of emissions and harm, already show that HERC is harming residents. Instead of finding that this data should support shutting down HERC to protect an already overburdened community from avoidable and unnecessary harm, MPCA argues that this evidence supports keeping HERC open and running at maximum capacity. MPCA should be doing everything in its power to reverse the historic harms to the most affected communities based on the environmental justice that it says it supports, rather than trying to use those very harms, such as high emissions from mobile sources of pollution, to justify keeping HERC open. MPCA's callous interpretation of its responsibilities and the data makes a mockery of its rhetorical support of environmental justice. Instead, it continues a form of structural racism that must be reversed.

Instead of performing in a scientific manner, as the agency often claims is central to its mission, it presents no science in its draft report to support its harmful conclusions and policy recommendations. This relegates the current draft report to mere bureaucratic fiat, not science.

⁸ A process of addressing difficult science issues by the National Academies of Sciences often contains a member of the broader public interest community, but this is weak public representation and should be considerably strengthened since affected community members bring knowledge and concerns that are unlikely to be adequately represented by others.

To remedy this, MPCA should recommend closing HERC as soon as possible and propose a much more ambitious program to achieve a high level of reduction, reuse, and recycling of waste. The current weak policy proposals for these widely agreed upon best management practices reveal that MPCA is not serious about protecting public health, the environment, or environmental justice.

MPCA must also endeavor to use the best cumulative risk assessment research available, and given the limitations, use a precautionary approach to protect the public. Deferring to future regulations, if that is the agency's predilection, would lock residents near HERC into years of unnecessary harm.

MPCA, given the highly contentious nature of the issues, should also empower a Scientific Advisory Committee of outside experts free of conflicts of interest, and with the empowered and meaningful participation of affected community members, to determine the best science regarding risk assessment for waste management processes.

MPCA also has the opportunity and responsibility to recommend to the State Legislature new legislation if needed. The Waste Management Act sorely needs revision to modify its current unscientific waste hierarchy to acknowledge that incineration and landfills are both harmful, and that incineration is not preferred over landfills. Both need to be reduced and eliminated, but in the case of incineration, it is currently possible to close HERC and therefore this must be done.

If MPCA is not willing to take these steps, it will continue down a path of lost credibility to all our detriment.

Endnotes

ⁱ Minnesota Statutes Chapter 115A. Waste Management. <https://www.revisor.mn.gov/statutes/cite/115A>

ⁱⁱ Cumulative Burden Analysis fact Sheet for Zip Codes 55407 and 55411. PSE. March 2023. <https://static1.squarespace.com/static/5fb58e0bd182a42ba80eabdd/t/649c93e555e7cd74d3737dfd/1687983078093/2023-03+Factsheet+Cum+Burden+Zips+55407%2C55411+-+Final%2CShared+%28%29.pdf>

ⁱⁱⁱ Billionnette, C. et al. (2012) Estimating the Health Effects of Exposure to Multi-Pollutant Mixture. *Ann. Epidemiol.* 22(2):126-141. <https://www.sciencedirect.com/science/article/abs/pii/S1047279711003425>

^{iv} Lagunas-Rangel, F. A., et al. (2022). Role of the synergistic interactions of environmental pollutants in the development of cancer. *GeoHealth*, 6, e2021GH000552. <https://doi.org/10.1029/2021GH000552>

^v Tait, P.W. et al. (2020) The Health Impacts of Waste Incineration: A Systematic Review. *Aust. NZ J. Public Health* 44: 40-48. <https://www.sciencedirect.com/science/article/pii/S132602002300732X>

^{vi} Harremoes, P. et al. (2001) Late Lessons from Early Warnings: The Precautionary Principle 1896-2000. European Environment Agency, Environmental Issues Report Number 22.

^{vii} About the Scientific Advisory Board (SAB) and the SAB Staff Office. <https://www.epa.gov/aboutepa/about-science-advisory-board-sab-and-sab-staff-office>