

## Comments from Joe Miller, Oregon PSR, re: Draft HIA on Metro's WTE Incineration Proposal 5/31/17

May 31, 2017

Rob Smoot  
Senior Engineer  
Metro Property and Environmental Services

Dear Rob and HIA Stakeholders,

Below and attached as a PDF find my written comments as requested re HDR and Ollson's draft HIA (characterized as a Rapid HIA in various places in the document). I found the HIA revealing in a number of ways:

1. Both models used to assess greenhouse gas (GHG) outputs concluded that "landfilling has lower GHG emissions than WTE, primarily due to the credit for carbon stored in the landfills" (iii). It's also noteworthy that landfill carbon storage was included in the GHG analysis "at the direction of Metro, [and] based on discussions with the Oregon DEQ" (v).

2. Many observations could be made about the comparisons made between the WTE and generic landfill options. I'll make just five:

2.1 I'll start by noting that the comparison isn't really WTE vs. landfilling, but rather, between WTE + landfilling vs. landfilling by itself. The HIA notes that incineration reduces the volume of the original waste by approximately 90%, and the mass of the waste by 70-80% (p. 14) or 70-75% (p. 64). Thus, for every 4 tons of waste incinerated, approximately one ton of incinerator ash is created and must be landfilled. [More about incinerator ash later.]

2.2 The HIA concludes that two health determinants have major negative (---) health impacts for both the WTE vs. landfilling options: Accidents & Malfunctions (especially fires), and Seismic Activity. Since the real comparison is between WTE + landfilling vs. landfilling by itself, the WTE + landfilling option has to be associated with much greater threats, since accidents, malfunctions, fires, and seismic events can potentially occur at two facilities (Covanta Marion and Coffin Butte Landfill) in the first option, versus one (the generic landfill) in the other. Seismic threats are also greater in the WTE + landfilling option, because both are much closer than the generic landfill to the subduction Juan de Fuca Plate, and to the off-shore Cascadian Subduction Zone.

2.3 The only health determinants judged to have a major positive (++++) effect for the WTE option were Employment and Working Conditions. These same determinants were not scored for the generic landfill, nor were any specific data requests made to the three landfills on which the generic landfill was based: Columbia Ridge near Arlington, Roosevelt Ridge near Roosevelt, WA, and Finley Buttes near Boardman.

2.4 Since virtually no information is included in the HIA on the employment and local/regional growth implications of the generic landfill option, below find selected perspectives on Waste Management's Columbia Ridge Landfill from an article that appeared in the East Oregonian newspaper in February of this year. [I'll note that I'm no fan of landfills, and have presented testimony against multiple Waste Management, Inc. proposals in Oregon, and when I resided in Indiana.] The article describes the landfill as employing "roughly 5 percent of the county's population," "as being one of the county's most valuable assets," and as generating fees to Gilliam County of "between \$2 million and \$3 million each year." The article also notes that:

In "the late 1980s, Metro found itself in a bind with the St. Johns Landfill in Portland filling up and nowhere else to turn for landfill space. Waste Management, which had already built a hazardous waste disposal site south of Arlington, proposed a second dump in Gilliam County. ... But in order for Waste Management to invest in a new facility, it needed a major commitment from Metro, which promised 90 percent of its solid waste to Columbia Ridge for 20 years. The contract was later extended to 30 years." [1]

2.5 Given Metro's past contract extension to 30 years (as described above), the comment about the WTE option in Table 30 (p. 86) takes on added significance: "It is expected that the expanded Covanta WTE Facility would require a contract between 20 and 30 years."

3. Many comments could be made about the sections of the draft HIA that address air emissions. I'll focus on six:

3.1 The HIA indicates that "the scientific literature on air quality modeling and potential health impacts has demonstrated that the maximum point of impingement of emission impact tends to be within one mile of such facilities" [i.e., modern WTE facilities] (p. 35), and that "the highest modeled ground level concentrations of contaminants typically occur within one mile of the stack" (p. 44). While this may be true for the point of maximal impingement and concentration, isn't the real issue the distance that air pollutants that have significant environmental and health related consequences travel? Given the height of the Covanta Marion stack, the pressure under which pollutants exit the stack, and other factors, it seems likely that significant levels of pollutants travel further than one mile.

3.2 One group of pollutants, the nitrogen oxides (NO<sub>x</sub>), is definitely transported considerable distances by the prevailing winds. Covanta Marion's average emissions were only 13-14% below the DEQ permit limit in 2011 through 2015, and only 4% below the more stringent and lower federal limit in 2011 through 2015. High levels of NO<sub>x</sub> impair respiratory and circulatory health, and contribute to ground-level ozone (smog), acid rain, water quality deterioration, and global warming. Because NO<sub>x</sub> is continuously monitored, there can be no doubt that the levels measured are representative of daily and yearly emissions under normal operating conditions.

3.3 Re the issues of soil quality and the bioaccumulation of that occurs in soil and water when air pollutants fall to the ground, the HIA cites (p. 71) a Literature Review done by HDR (listed in the references as HDR, 2017, Literature Review) "of a number of soil sampling and risk assessment programs that have been conducted on European WTE facilities that have been operational for some time." HDR particularly focuses on the work of Dr. Jose Domingo in Spain on European WTE's "for well over a decade," work that HDR indicates "has consistently reported that levels of PCDD/Fs, PCB, and metals do not significantly accumulate in soil samples surrounding modern WTE facilities." I'd like much more information on the details of Domingo's research, the WTE's he has studied, the meaning of the phrase "modern" WTE facilities. etc. If nothing else, little time would have passed in "modern" WTE facilities for the results of their air emissions to bioaccumulate in the soil.

3.4 Staying with the issues of soil quality and bioaccumulation, the following excerpt from the testimony of incinerator expert Dr. Jorge Emmanuel, consultant to many countries and international agencies and organizations, describes the effects and persistence of just one group of pollutants -- dioxins and furans:

"Incinerators produce the most toxic compound known in science, namely, 2,3,7,8-tetrachloro-dibenzo-p-dioxin and other similar compounds which I will simply call "dioxins." Dioxins are toxic at very low levels and are known to cause cancers (specifically chronic lymphocytic leukemia, soft tissue sarcoma, non-Hodgkin's lymphoma, prostate cancer, as well as cancers of the lungs, larynx and trachea). They also cause birth defects, alter the reproductive systems of fetuses, impact the IQ of children, suppress the immune system, decrease fertility, cause ovarian dysfunction, and reduce the sizes of male genitalia. They are highly persistent in the environment, so any dioxins produced today will remain for up to 150 years if on top of the soil, more than 500 years if in bodies of water, and up to 1000 years if the dioxins are covered by a few centimeters of soil surface." [2]

3.5 As noted in the HIA (pp. 14 & 52), while the emission levels of NO<sub>x</sub> and other criteria pollutants are monitored by continuous emissions monitoring systems (CEMS), the emission levels of other pollutants such as mercury, lead, cadmium, hydrochloric acid, and dioxin/furan are tested only annually in stack tests. Staying with the focus above on only one group of pollutants -- dioxins and furans -- the following excerpt from the Energy Justice Network provides a compelling illustration of the inadequacies of such annual stack testing, and of the dramatically different results that are likely to be reported if long-term AMESA (Adsorption Method for Sampling of Dioxins and Furans) continuous sampling were employed:

"Dioxin emissions monitors were tested and verified by EPA in June 2006. ... Some of these are actually real-time monitors, while other are semi-real-time or are long-term samplers. Long-term sampling allows for a complete picture by collecting the sample for periods of up to 30 days. This makes it possible to take 12 samples per year, collecting a complete picture of actual dioxin emissions. Research from the UK found that

AMESA's continuous sampling shows higher dioxin emissions than typical stack tests, and research from Belgium shows that the difference can be 30-50 times higher. This is largely because annual stack tests are not done when dioxin emissions are known to be the highest, during start-up, shut-down, and malfunction times, when air emissions permit limits do not even apply and no monitoring is usually done. Dioxin formation is highly temperature-sensitive, which is why it's important not only to have continuous monitoring to show the real emissions levels, but to have real-time feedback to operators so that they can adjust the operating conditions to minimize dioxin formation.

EPA's dioxin CEMs factsheet states: "Long-term continuous samplers collect samples over time periods up to several weeks to obtain a cumulative record of source emissions and provide evidence of emission levels. Real or semi-real-time continuous monitors, with a frequency of measurement at real time or up to an hour, provide quick feed back to the plant operator by measuring dioxin emission levels on-site." AMESA is one of two long-term samplers EPA has tested and verified. IDX Technologies has a laser-based real-time dioxin monitor that EPA has tested and verified." [3]

3.6 An additional dramatic illustration of the inadequacies of annual stack tests is provided by the discovery last May that one of the two boilers at the recently approved Covanta built and operated Durham York Energy Centre (DYEC) in Clarington, Ontario, Canada was emitting dioxins and furans at more than 12 times its permit limits. [4,5]

The massive emissions exceedence was only detected because of commitments citizens had previously secured from officials to conduct stack tests on a twice a year basis, rather than the usual once a year basis. There's no way, however, to know what the emissions of dioxins and furans were in the months prior to May, and whether they were at, below, or above the more than 12 times the limit level.

4. Given the HIA's frequent references to the Durham York Energy Centre (DYEC) WTE facility, additional information on DYEC and its performance to date are appropriate.

4.1 Since Metro and the HIA cite the DYEC incinerator as a state-of-the-art incinerator and as a model for the type of expansion envisioned at Covanta Marion, it's worth noting that the \$295 million, 140,000 tons capacity per year WTE plant began commercial operation in January, 2016 a year behind schedule, \$21 million over budget, producing 2.5 % more ash than originally specified, with both boilers initially failing but later passing tests for dioxins and furans in late 2015, and (as noted above) with one boiler emitting more than 12 times the levels of dioxins and furans for an unknown period of time until the massive exceedence was detected five months after the facility started commercial operation. [6]

4.2 It's also worth noting that in December, 2016, a fire occurred on the DYEC roof caused by steam emissions following an unexplained shutdown of the facility, and two other fires occurred in October of 2016, and January of 2017. [7,8]

4.3 Also very noteworthy is the fact that in early 2017, both boilers -- not yet a year old -

- spent a combined 90 days shut down for repairs to address corrosion of tubes within the boilers. [9]

5. Several comments are warranted about incinerator ash, especially fly ash, and the differences in the way it is treated at Covanta Marion and DYEC.

5.1 Re incinerator ash, as noted by emeritus environmental chemistry and toxicology professor Paul Connett:

"Incineration releases many toxic metals from otherwise fairly stable matrices. At worst these metals (lead, cadmium, mercury, chromium etc) go into the air, at best they are captured in the fly ash in the air pollution control devices (APC). But it is a truism to state that the better the APC the more toxic the ash becomes. ... For every four tons of trash burned you get at least one ton of ash: 90% is called bottom ash (that is the ash collected under the furnace) and 10% is the very toxic fly ash." [10]

5.2 The difference in the treatment of toxic fly ash at Covanta Marion and at the Durham York Energy Centre (DYEC) in Clarington, Ontario is revealing. As noted in the HIA (pp. 14 & 64), at Covanta Marion bottom ash and fly ash are collected and combined on the same conveyor system, and the combined ash (minus recovered ferrous and non-ferrous metals) is then transported to Coffin Butte Landfill and used as alternate daily cover.

5.3 While the above system is common in the U.S., toxic fly ash from boiler processes and air pollution control (APC) devices is treated very differently at DYEC, and kept separate and first stabilized in cement before being landfilled. More specifically, at DYEC fly ash and APC residue go first to a Residue Storage Building where they are mixed with a pozzolanic material, Portland cement and water, and then repeatedly cured, broken up, and moved through a series of up to 7 bunkers, spending up to 3 days at each bunker (a maximum of 21 days), until testing yields a non-hazardous characterization, and the ash is then landfilled. [11]

5.4 The HIA (p. 65) notes that "given that only MSW will be accepted from Metro, the composition of the ash is expected to be consistent with ash currently generated at the facility." Given Metro's excellent actions to reduce food waste in MSW, however, including its recently approved anaerobic digestion and energy recovery facility franchise ordinance for SORT Bioenergy in Wilsonville [12], the overall percentage of plastics and other non-food waste in the MSW stream can be expected to increase in the future. Incinerating MSW containing greater proportional percentages of plastics and other non-food waste will increase air emissions of pollutants, and increase levels of pollutants in fly and bottom ash. Landfilling MSW comprised of reduced percentages of food waste, and increased proportional percentages of plastics and other wastes, however, will reduce methane generation, and result in greater storage of the carbon contained within plastics and other wastes derived from fossil fuels.

Thanks for reading and considering my comments.

Best,

Joe Miller PhD  
Representing Oregon Physicians for Social Responsibility

[1] <http://www.eastoregonian.com/eo/local-news/20170202/arlington-landfill-working-to-keep-portlands-trash>

[2] <https://noharm-asia.org/articles/news/asia/intl-environmental-expert-warns-dangers-lifting-incineration-ban-ph>

[3] <http://www.ejnet.org/toxics/cems/>

[4] <https://www.durhamregion.com/news-story/6692836-covanta-fails-latest-test-at-courtice-incinerator/>

[5] <https://www.thestar.com/news/gta/2016/06/14/durham-grapples-with-incinerators-alarming-emissions.html>

[6] <http://www.psr.org/chapters/oregon/assets/pdfs/miller-testimony-metro-durham-wastetoenergy-7-21-16.pdf>

[7] <http://oshawaexpress.ca/incinerator-shutdown-cause-unknown/>

[8] <http://oshawaexpress.ca/small-fire-at-incinerator/>

[9] <http://oshawaexpress.ca/incinerator-back-up-and-running/>

[10] <http://www.no-burn.org/why-incineration-is-a-very-bad-idea-in-the-twenty-first-century/>

[11] [https://www.durhamyorkwaste.ca/Assets/Documents/FacilityManagement/Ash/Ash\\_Sampling\\_and\\_Testing\\_Protocol.pdf](https://www.durhamyorkwaste.ca/Assets/Documents/FacilityManagement/Ash/Ash_Sampling_and_Testing_Protocol.pdf)

[12] [http://www.oregonmetro.gov/sites/default/files/SORT\\_F-173-17\\_staffrpt.pdf](http://www.oregonmetro.gov/sites/default/files/SORT_F-173-17_staffrpt.pdf)