November 18, 2019

Oregon Department of Environmental Quality
Western Region Air Quality Program
Attn: Gary Andes
4026 Fairview Industrial Dr. SE
Salem, OR 97302

Re: Covanta Marion, Inc's Proposed Title V Air Quality Permit Renewal

Mr. Andes and the Western Region Air Quality Program Staff:

Oregon Physicians for Social Responsibility ("Oregon PSR") and the undersigned organizations respectfully submit these comments in response to the Oregon Department of Environmental Quality ("DEQ") call for public comment on Covanta Marion Inc's ("Covanta") Proposed Air Quality Permit Renewal.

Guided by the values and expertise of medicine and public health, Oregon PSR works to protect human life from the gravest threats to health and survival. We are an organization of over 2,000 health professionals and public health advocates across the state working collaboratively with community partners to educate and advocate for societal and policy change that protects human health at the local, state, national and international level.

In addition, the following organizations have also signed onto these comments and will be represented jointly as "Oregon PSR" in the body of these comments: PCUN

(Pineros y Campesinos Unidos del Noroeste), OPAL Environmental Justice Oregon, OPAL Environmental Justice Oregon, 350 Salem OR, 350 PDX, Neighbors for Clean Air, and the Global Alliance for Incinerator Alternatives (GAIA).

Scientific and policy review indicates that the Covanta Marion, Inc. waste-to-energy municipal trash incinerator, represents a substantial short and long term risk to the public health. Oregon Physicians for Social Responsibility (Oregon PSR) notes further that the facility has been operating without a current air quality permit since April 2017. A great deal of uncertainty exists regarding the emission, deposition and adverse effects of toxins associated with Covanta. A more comprehensive evaluation of Covanta Marion toxic emissions is expected through the Cleaner Air Oregon process in 2020. Therefore, Oregon PSR recommends that the Oregon Department of Environmental Quality (DEQ):

- Deny Covanta's air quality permit unless and until a credible and comprehensive evaluation demonstrates that the facility does not represent a significant public health risk to the host community and is not a net contributor to greenhouse gas emissions (GHG) as compared to alternatives for waste disposal and energy generation.

- Conduct an evaluation by disinterested third party evaluators that includes minimally:
  - A study of ambient air, water, and soil quality for all of the criterion air pollutants and significant hazardous air pollutants associated with incinerators.
  - A comprehensive Health Risk Assessment (HRA) for exposed populations within a 10 km radius, to include an evaluation of vulnerable populations
  - Dispersion modeling to establish how far pollutants are likely to spread into the environment.
  - A greenhouse gas lifecycle analysis for Covanta and alternatives, including landfill and zero waste options.

- Conduct a public hearing about Covanta Marion in the local community.

Oregon PSR bases these recommendations on the following findings:

- Toxic Emissions: Covanta Marion is one of the top 20 polluters in Oregon, emitting dozens of toxins known to be detrimental to human health and the environment.

- Aging Facility: Facilities built before 1995, like Covanta, emit more toxins over time and US Environmental Protection Agency (EPA) rules permit aging facilities to emit higher levels of toxins.
- Greenhouse Gas Emissions: Substantial scientific evidence exists that waste incinerators are net contributors to GHG emissions in excess of options for both trash disposal and energy generation.
- Emissions Monitoring: Stack emissions are inadequately monitored and actual concentrations of toxins in ambient air, water or soil quality have never been measured.
- Environmental Protection Agency Standards: EPA rules governing municipal waste incinerators are not based on best available technology, do not regulate a host of known toxins, and fail to take into account other factors such as simultaneous toxic exposures.
- Environmental Justice: A comprehensive Health Risk Assessment (HRA) of the host community has never been performed, nor has the community been allowed any meaningful input. Evidence suggests that significant at-risk populations reside in the vicinity of the incinerator.
- Regulatory Failure: A substantial history exists of regulatory failure at DEQ including reliance on proprietary interests to conduct performance monitoring rather than disinterested third party entities.
- Adverse Health Effects: Known effects of toxins emitted include carcinogenesis, poor pregnancy and childhood development outcomes, and impairment of lung, cardiovascular, liver, kidney, neurological and endocrine function.

The above findings raise considerable uncertainty regarding the short and long term safety of the Covanta Marion facility and support the view that the facility violates principles of environmental justice and is a major contributor to global warming. Fortunately alternatives exist to incineration. Landfills themselves present environmental concerns. Zero waste options should be more aggressively pursued.

Oregon PSR recognizes that shut down of Covanta Marion would result in the loss of up to 38 jobs, which is itself a public health threat to the community. According to an investigation commissioned by Metro, these are union jobs (Operating Engineers), with average pay and benefits well above the average for the Salem area. (Ollson Environmental Health Management, 2017) Furthermore, according to Covanta Marion, job satisfaction is reportedly high, turnover low, and accident rates well below the national average.

Covanta Marion is yet another example of how polluting industries hold jobs hostage in order to continue befouling the environment and push our communities

closer to climate catastrophe. Neither the market nor the state is prepared to step in and ensure that these workers will transition to equally good jobs without economic loss and with minimal disruption. Oregon policymakers shirk their responsibility to our communities by failing to plan for a just transition for workers like those at Covanta Marion, as the mandate grows to shut down polluting operations that contribute to global warming. Oregon PSR believes we need a Green New Deal in Oregon.

Toxic Emissions

Covanta Marion is a waste-to energy municipal trash incinerator which also incinerates hazardous medical waste. The energy generated through incineration is sold back to Portland General Electric. Trash incineration is an incredibly toxic process which discharges into the environment a witch's brew of pollutants, (Department of Environmental Quality, 2019) including all six of the US Environmental Protection Agency (EPA) designated "criterion air pollutants": carbon monoxide, lead, nitrogen dioxide, ozone, particulate matter, and sulfur dioxide. (US Environmental Protection Agency, n.d.) Criterion air pollutants are both common and possess known toxic effects on human health and the environment, including crops, wildlife, vegetation, and the built environment. Some large but unknown number of EPA designated "hazardous air pollutants" are also emitted, including: volatile organic compounds, acid gases, heavy metals, and dioxins/furans, all of which are hazardous to human health.

Toxins are released into the environment through the stacks, but are also present in the combustion residue. This includes the bottom ash and the heavily contaminated fly ash, which are trucked to a landfill for disposal. According to the EPA the amount of ash generated ranges from 15 to 25% by weight of the total waste processed. (US Environmental Protection Agency, n.d.) It is a fallacy to assume that toxins are simply burned away. They are not. One way or another they are deposited into our environment. Worse, the incineration process actually creates pollutants not already present in the trash by burning organic material with various chemicals or plastics. These include the highly toxic and persistent dioxins and furans.

Pollutants from combustion find their way into our agricultural products, our drinking water, and other foods, like fish and shellfish. Many of the pollutants can persist in the environment for years or decades and can spread or be distributed over a wide area through bodies of water, wildlife migration, distribution of agricultural products and other processes. (Committee on Health Effects of Waste Incineration, 2000) Some of these toxins bioaccumulate, which means that neither humans nor animals can rid their bodies of the toxins and they build up over time in bones or internal organs.

The adverse health effects of these toxins are numerous and include cancer, growth and development problems, and deleterious effects on every single bodily organ

and system. (See below for a comprehensive assessment of adverse health effects and further references.)

DEQ has designated Covanta Marion as one of the twenty most toxic industries in the state and has scheduled Covanta for a more comprehensive assessment in 2020 under Cleaner Air Oregon mandates. By comparison, not one landfill in Oregon is among the top 40 polluters in Oregon. (Department of Environmental Quality, 2019)

(For more on the compromised process of Cleaner Air Oregon see below under Regulatory Failure.)

Aging Facility

In May of 2019 Covanta testified before the Oregon State Senate Rules Committee in a failed bid to become eligible for Renewable Energy Credits (REC). The Covanta representative testified that: "The facility is of an age that it needs maintenance and improvements which are planned over the next several years. These investments are necessary for the continued operation of the plant and the REC revenue is essential to pay for this work. To complete this essential work without REC revenue, Covanta would need to more than double the cost of disposal services it provides to Marion County…. [or] the facility would close." (Covanta, 2019)

Covanta Marion, which went online in 1987, represents an older generation of waste-to-energy facilities, which are known to emit more toxins over time. However, in lieu of shut-down or upgrading, aging waste incinerators, like Covanta, can continue to operate legally under EPA rules, which simply hold aging facilities to lower standards. Emissions at Covanta are subject to EPA standards for "existing" (operational prior to 1995) facilities, which are far lower than those for new facilities. (US Environmental Protection Agency, 2006). This is in contrast to standards in the European Union, which are based on the best available technology and apply to all facilities, existing or new. (European Commission, 2014)

According to Covanta's own numbers, emissions at the facility have met or exceeded EPA standards for existing incinerators and in some cases, for new facilities. But this should not reassure the public. As emissions increase for the facility, which they will, the lower standards can be applied and the plant can continue to operate legally. Because of this, Covanta has no incentive to invest in expensive upgrades without public subsidy.

In fact, for the current permit, allowable limits for particulate matter have been increased, based on the fact that emissions at the plant have increased. (Department of Environmental Quality, 2019) With this permit, Covanta would be allowed to emit higher volumes of particulate matter, cadmium, lead, hydrogen chloride, dioxins/furans, and nitrogen oxides than a comparable facility built after 1995. The health impacts of these

air contaminants have serious impacts on human health that are detailed in this document under “Adverse Health Effects.” It should be noted that no safe levels exist of exposure to particulate matter (Di, 2017) or to lead (World Health Organization, 2019).

Greenhouse Gas Emissions

Whether trash incinerators are bigger contributors to greenhouse gas (GHG) emissions in comparison to landfills or to energy production from coal, oil, and gas has generated considerable scientific controversy. As recently as 2016, the EPA claimed that burning trash will “reduce the amount of [GHG emissions] in the atmosphere compared to landfilling.” (Maize, 2016)

Covanta, likewise, testified in May of 2019 that waste-to-energy facilities “reduce GHG emissions by avoiding landfill methane, displacing fossil-fuel fired electricity, and recovering metals for recycling … Scientists from the National Renewable Energy Lab, or NREL, concluded ‘Life cycle assessment studies published in the literature have generally been consistent in suggesting that MSW combustion is a better alternative to landfill disposal in terms of net energy impacts and CO2-equivalent GHG emissions.’” (Covanta , 2019)

The NREL paper referred to in their testimony, however, was quite explicitly *not* about aging facilities like Covanta. It reads: “Compared to WTE [waste-to-energy] facilities of the 1970s and 80s, WTE is now a refined, clean, well-managed application for energy production.” (Funk, Kip, et al, 2013) Covanta’s testimony, then, cannot be viewed as other than an attempt to obfuscate.

Yet another and even more significant problem exists in Covanta’s assertion that trash incinerators generate fewer greenhouse gases than landfill options. To evaluate GHG emissions one must conduct a complex calculation called a lifecycle assessment or analysis (LCA). For trash incineration this means counting not just stack emissions, but all greenhouse gases generated, from how the waste is collected and transported, what is recycled and how, and the final disposition of the ash. A lifecycle analysis is necessarily site-specific. Until recently, lifecycle analyses for trash incinerators have been based on a GHG accounting method which has been scientifically debunked.

Both landfills and incinerators generate biogenic GHG emissions through burning of biomass (lawn clippings, wood, food waste, etc.) and anthropogenic emissions through burning human-made products, chiefly plastic. The trash incineration industry and the EPA had long claimed that biogenic GHG emissions from incinerators were carbon neutral, meaning that this share of emissions was entirely offset by natural regenerative processes (like regrowth of trees). Since biogenic GHG makes up about half the total GHG emissions from incinerators, this assumption tilted the calculus substantially in favor of incineration. The National Renewable Energy Lab report cited

by Covanta in their testimony referenced above used a methodology (MSW-DST) which *excludes* the impact of biogenic GHG emissions. (Funk, Kip et al., 2013)

However, in their review of dozens of scientific papers, reports, and EPA documents, the Energy Justice Network demonstrated amply that the science does not support a calculus that excludes biogenic emissions. (Ewall, 2014)

In 2013 the Washington DC appeals court agreed. In a case brought by environmentalists against the EPA and their corporate allies, the court ruled that: “the atmosphere makes no distinction between carbon dioxide emitted by biogenic and fossil-fuel sources.” (United States Court of Appeals for the District of Columbia Circuit, 2013) Several months later the EPA proposed a new rule to reflect the finding of the court. (US Environmental Protection Agency, 2014) This year, 2019, the ruling is reflected for the first time in DEQ air quality standards for incinerators. (Department of Environmental Quality, 2019) However, rather than holding Covanta’s feet to the fire to lower GHG emissions, DEQ simply doubled the annual allowable GHG emissions, in essence, permitting the status quo.

In 2017 Metro Regional Government considered sending Portland area municipal waste to Covanta instead of a landfill. As part of their evaluation, Metro commissioned a Health Risk Assessment (HRA) of each option. (Ollson Environmental Health Management, 2017) As part of that analysis, Ollson conducted lifecycle analyses of GHG emissions of Covanta Marion compared to Metro’s current landfill process. They used two peer-reviewed methods to perform the analysis. Both were developed by the EPA. One was the same MSW-DST method used in the paper cited in Covanta’s testimony.

The findings were equivocal, one slightly favoring Metro’s landfill option, the other Covanta. However, both methods discounted biogenic GHG production. Biogenic emissions at the landfill option considered in this analysis constitute 31% of total GHG emissions while the corresponding fraction for Covanta is 54%. (Department of Environmental Quality, 2017) Addition of the biogenic portion of GHG into either model would most certainly tip the balance in favor of landfills. Of further note is that the landfill option for Salem’s trash, Coffin Butte, reports a biogenic GHG emission fraction of only 15% (not including the Pacific Northwest Generating Cooperative, which generates electricity from landfill gas captured from Coffin Butte).

In 2017 a lifecycle analysis was conducted by Olympia-based Sound Resource Management Group for Covanta Fairfax in comparison to Washington DC landfill options. This evaluation counted biogenic emissions for both. Using data from the EPA, US Energy Information Administration, and Virginia’s DEQ, the study demonstrated that Covanta Fairfax produced significantly more GHG than any of the landfill options considered and more GHG per megawatt hour of energy production by burning coal, oil or gas. (Morris, 2017)

Although landfills are also significant sources of toxic and GHG emissions, they have the advantage over incinerators in that they bury and sequester indefinitely a substantial share of carbon equivalents while incinerators accelerate their release. The problem is plastics, which account for a rising share of waste, according to a study by the Center of International Environmental Law. (Center for International Environmental Law, 2019) This paper reported on a lifecycle analysis of three options for plastic waste disposal—recycling, landfill, and incineration— and concluded that incineration emitted more GHG than landfill by a factor of 15.

In their analysis for Metro, Ollson pointed out that burning plastics is tantamount to burning fossil fuels and that a substantial share of the GHG emissions at Covanta are due to the large volume of fossil-fuel derived plastics in the waste. (Ollson Environmental Health Management, 2017)

Counting both biogenic and anthropogenic emissions, Covanta Marion is already the 20th largest emitter of GHG in the state. (Department of Environmental Quality, 2017) Current trends in plastic use and disposal suggest Covanta's share of GHG production in Oregon may well increase over time. Better to bury plastic than burn it. Apparently, this is what Metro decided when it rejected the option of sending Portland's waste to Covanta Marion.

EPA Standards

EPA standards are problematic in ways other than lax standards for aging facilities. In their comparison study of European Union versus EPA standards for waste incineration, researchers unearthed significant philosophical differences. While the US approach is to balance risk to human health with economic considerations, the European Union seeks to establish the lowest possible exposure limits based on best available technology. (Liacata, 2005) The practice of including economic considerations, which generally means corporate interests, has increased during the current administration. (Buford, 2017)

EPA standards are also based on individual exposure to single toxins at a time, which ignores the effects of combined exposures, which is by far the usual case. For example, particulate matter can serve as the vehicle to carry air-borne carcinogens deep into the lungs. Or one neurotoxin, mercury, worsens the effects of another neurotoxin, lead. Some toxins, for example, particulate matter (Di, 2017) and lead (World Health Organization, 2019) have been shown to have no safe level of exposure. To say that emissions standards are met does not mean that harmful exposure is not happening.

EPA standards for incinerators do not include many of the known toxics emitted. Most of the air toxics regulated for incinerators by the EPA are the so-called hazardous

air pollutants. As early as 2004 air quality experts pointed out that despite the introduction of an estimated 300 new chemicals into US industrial processes per year, no chemicals had been added to the EPA list of HAPs. (National Academies Press, 2004) The list in 2019 is virtually unchanged from the list in 2004. (US Environmental Protection Agency, 2019) What all is rising out of the stacks at Covanta Marion is to some large degree unknown and unregulated. We do know that incinerators emit arsenic, chromium, hydrogen fluoride, nickel, and polychlorinated biphenyls (PCBs). None of these toxics is currently regulated.

Emissions Monitoring

Air quality standards for incinerators are based wholly on emissions for selected toxins as opposed to actual measurement of concentrations in ambient air, water, and soil. Emission monitoring itself is inadequate. Emissions of carbon monoxide, nitrogen oxides, and sulfur dioxide are monitored by a continuous emissions monitoring system. (Department of Environmental Quality, 2019) Standards otherwise mandate only annual sampling of the remaining toxics, biannually for dioxins/furans. This single sampling is then used to calculate the total annual emissions. Emissions, however, vary from day to day depending on what and how much is being burned. The relationship of this calculated value to actual total emissions is unknown, since the latter is never actually measured.

Furthermore, the annual sampling is conducted by an outside firm hired and supervised by Covanta, with only off-site technical oversight by DEQ. This process provides ample opportunity to cook the books and fails to inspire confidence in the process. Covanta has already demonstrated its willingness to employ outdated science and science that does not apply to its facility in order to further its corporate interests. Consider, in addition, that Covanta asked Ollson, who conducted the Health Risk Assessment for Metro, to modify their modelling assumptions on which Ollson's greenhouse gas lifecycle analyses were based. (Ollson Environmental Health Management, 2017) All of the requested modifications would have favored incineration over landfill. Ollson declined to make the modifications.

Even if one accepts that annual samples conducted by proprietary interests can result in accurate values for total annual emissions, the relationship of emissions to what is actually present in the environment is uncertain. According to a consensus report published by the National Academy Press, dispersion of toxins into the environment depends on a host of factors and although most toxins wind up in air, water or soil within a 10 km radius, some are much more broadly dispersed. (Committee on Health Effects of Waste Incineration, 2000) DEQ has never conducted any testing of

ambient air, water, or soil in the area around Covanta Marion. We simply do not know what and how much is in the environment.

The Health Impact Assessment (HIA) conducted for Metro noted the lack of ambient air quality data for Covanta and recommended, as part of Metro's decision-making process, a baseline air monitoring program for one year involving a "broad suite of chemicals" beyond those currently regulated. The HIA also recommended a detailed air quality dispersion modeling to determine more precisely where emitted chemicals might eventually be deposited into water and soil. (Ollson Environmental Health Management, 2017)

Environmental Justice

The concept of environmental justice originated with the realization that commercial hazardous waste landfills in the South were located most often (three out of four) in African American neighborhoods. A study in 1987 found that race was the strongest variable in predicting the location of waste facilities. (Bullard & Johnson, 2000) The EPA has since endorsed environmental justice for all communities:

> "Environmental Justice is the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. This goal will be achieved when everyone enjoys the same degree of protection from environmental and health hazards and equal access to the decision-making process to have a healthy environment in which to live, learn, and work." (US Environmental Protection Agency, 2007)

Precisely which communities are impacted by toxic emissions from Covanta is unknown, because DEQ has conducted no testing of air, water or soil in the surrounding area. The Health Impact Assessment conducted for Metro states that the highest concentration of pollutants is most likely located within a 1 mile radius of the facility. (Ollson Environmental Health Management, 2017) However, a National Academy of Science Press consensus report notes that the dispersion of toxins into the environment depends on a host of factors and although most toxins wind up in air, water or soil within a 10 km radius, some are much more broadly dispersed. (Committee on Health Effects of Waste Incineration, 2000). Given this lack of certainty about the area impacted by Covanta, we considered the potentially exposed populations to include a 10 km (6.2 miles) radius. Communities within a 10 km radius include Gervais, Woodburn, Keizer, and parts of Salem.

Covanta is located in the unincorporated town of Brooks, Oregon, north and east of Salem in Marion County. The 2019 population of Brooks is 977. The town's economy has traditionally been based on agriculture with NORPAC, a vegetable and fruit food processor, being the largest industrial property in the area. NORPAC, a farmer-owned cooperative in business for more than 90 years, declared Chapter 11 bankruptcy in August of this year. Covanta is the other major industry. Brooks Elementary school, Willamette Valley Christian School, Chemeketa Community College, and Northwest University Salem campus are sensitive locations in Brooks, located within a mile of the Covanta facility.

Gervais, just north of Brooks, population 2,464, has primarily farm or nursery related businesses. Several schools are in Gervais, including Gervais Elementary, Middle and High school as well as the Sacred Heart School, Douglas Alternative School, and Salem Bible College. No heavy industry is located in Gervais.

Woodburn, a rural community located north of Brooks and Gervais, has a population of 25,067, and is the third largest city in the County. The majority of inhabitants identify as Latino, but a significant population of Russian Old Believers also resides there. Numerous schools, churches, a community health center, and assisted living facilities for seniors are located in the town. Amtrak runs through Woodburn but does not stop. There are a number of farms and nurseries in or near Woodburn, but no heavy industry. Woodburn Refuse Disposal Site, a Marion County facility, accepted ash from Covanta Marion until 2015. No data is available on toxic emissions from the ash into the surrounding environment.

The demographic data below compare the various localities in the shadow of Covanta. Brooks and Woodburn, in particular, have a younger population, which is at higher risk of adverse health effects from polluting industries. Compared to the state overall, Marion County and all of the cities and towns nearby have a significantly higher percentage of Latinos as well as persons who speak a language other than English at home. It is well documented that minority populations experience poorer health compared to whites (health disparities), which make them more vulnerable to ambient pollutants.

Demographic Data: U.S. Census Data 2017: (US Census Bureau, 2017)

	Population	Persons < 5	Persons < 21	Persons > 65	Female persons	Hispanic or Latino %	Two or more Races	Persons speaking language other than

								English at home
Brooks	791	10.6%	40.5%	4.3%	44.6%	38.2%	0%	41.7%
Gervais	2,464	5.9%	29.1%	3.0%	45.3%	71.6%	3.6%	60.1%
Woodburn	25,067	7.3%	35.2%	13.9%	51.9%	56.3%	3.4%	57.3%
Keizer	37,910	6.6%	28.6%	16.1%	51.8%	20.3%	7.0%	18%
Salem	154,637	6.7%	29%	13.3%	49.9%	22.4%	7.0%	21.5%
Marion County	315,335	6.8%	29.5%	14.6%	50.2%	26.0%	6.6%	25.1%
Oregon	3,831,074	5.8%	25.3%	16.3%	50.5%	12.7%	4.6%	15.2%

High School graduation rates are lower than the state average in Brooks and even lower in Woodburn and Gervais. Median income is lower than the state average in Woodburn, Gervais, and Salem, but above the median in Brooks and Keizer. The poverty rate is significantly higher in Woodburn and higher in Salem. Of note is the high percentage of mobile home housing in Brooks and Gervais, which may indicate pockets in the communities in which health disparities exist.

Demographic Data: U.S. Census Data 2017: (US Census Bureau, 2017)

	High School Graduation	Median Income	Person < Poverty Level	Unemployment Rate	Home Ownership	Housing units/ mobile homes
Brooks	81.4%	$59,152	15%	0%	70%	44.1
Gervais	75.1%	$51,841	14.4%	15.3%	80.8%	17%
Woodburn	71.5%	$47,042	23.7%	6.4%	62%	8.7%
Keizer	89%	$60,722	13.8%	6.6%	-----	5.5%
Salem	86.7%	$51,666	16.2%	6.8%	53%	5.1%

Marion County	84.9%	$53,828	15.9%	6.8%	59.8%	8.9%
Oregon	90.2%	$56,119	14.9%	6.8%	61.7%	8.2%

The Marion-Polk County Health Assessment of 2019 found that the five leading causes of mortality in the community were: (1) cancer, (2) heart disease, (3) unintentional injuries, (4) stroke, and (5) chronic lower respiratory diseases. The mortality rate in Marion County has been increasing. In general, those who identified as White, non-Hispanic, African American/Black, or American Indian/Alaskan Natives died at higher rates in the community than Asian/Pacific Islanders and Hispanics. The average life expectancy for a newborn in the community was about 80 years, which was similar to the state. Male newborns, along with African American/Black, and White, non-Hispanic newborns, had lower life expectancies than their peers. About 26,600 years of life would be added back to the community each year if premature death before the age of 75 was avoided. (Marion and Polk Counties, 2019)

Mortality

	Premature Age-adjusted Mortality*	Age-adjusted death rate**	Child Mortality***	Infant****
Oregon	310	707.0	40	5
Marion County	320	736.6	40	6

*2013-2015 (Robert Wood Johnson Foundation, n.d.)
** (Oregon Health Authority, 2017)
***2012-2015 (Robert Wood Johnson Foundation, n.d.)
**** 2007-2013 (Robert Wood Johnson Foundation, n.d.)

Oregon Vital Statistics provides mortality data only for the cities of Woodburn, Keizer, and Salem, not for Brooks or Gervais. In addition, the mortality data is not age-adjusted, making it impossible to evaluate against overall County or State data.

The Robert Wood Johnson Foundation provides health rankings by county. Of the 35 counties ranked in Oregon, Marion County had an overall health rank of 14, but lower rankings for various health factors and behaviors (21 of 35), social and economic (18 of 35) and physical environment (33 of 35). The incidence of obesity, sexually transmitted infections, and teen births, especially among Latinos is higher than the state overall. There is a higher incidence of children living in poverty and those who qualify for

free or reduced school lunches. Of note is that air pollution is worse in the County as measured by the density of particulate matter in the air.

Selected health indicators: Comparison of Marion County Health with Oregon and U.S. 2015-2017 (Robert Wood Johnson Foundation, 2017)

	Marion County	Top U.S. Performers	Oregon
Health Behaviors			
Obesity	**34%**	26%	28%
Sexually Transmitted Infections*	**514.4**	152.8	432.5
Teen Births**	**29**	14	20
Teen Births—Hispanic	**44**		
Clinical Care			
Uninsured	**9%**	6%	7%
Social and Economic factors			
High School Graduation Rate	76%	96%	77%
Children in Poverty	**20%**	11%	17%
Median Income	**56,100**	67,100	60,100
Children eligible for free or reduced lunch	**64%**	32%	51%
Physical Environment			
Air Pollution***	**9.1**	6.1	7.9

*Chlamydia cases per 100,000
**Births per 1,000 female population 15-19
***Average density of fine particulate matter, micrograms per cubic meter

More recently, the Community Health Assessment for Marion-Polk Counties, completed in 2019, looks at the overall health of the community over the past 5 years. (Marion and Polk Counties, 2019) Relevant findings include an increase in chronic illnesses, including diabetes, obesity and depression. Suicide and suicidality among teens has increased, as well as sexually transmitted infections, including gonorrhea, syphilis, HIV and Hepatitis B. With regard to the social determinants of health, this community struggles with lower educational achievement, higher rates of poverty, especially among children (25% vs. 20% in Oregon), food insecurity, and unaffordable housing. Demographically, there is a higher percentage of youth in Marion County than in the state overall, and persons of Hispanic origin (26% vs. 12%), persons speaking a language other than English at home (25%), and persons with disabilities (15%).

Environmentally, air quality was described as “good” in Marion County for most of the year but diminishes to “unhealthy for sensitive groups” in the late summer because of forest fires. Water quality indicators, however, showed that a lower percentage of community water systems were meeting health standards than the state as a whole and are not meeting the Environmental Protection Agency (EPA) targets.

The Environmental Justice Screening and Mapping Tool (EJSCREEN) was developed by the EPA to assist communities in identifying environmental issues in relationship to at-risk populations. (US Environmental Protection Agency, n.d.) Below is a table from the EJSCREEN for a 6.2 miles radius around Covanta Marion, which corresponds to the 10 km radius where emitted toxins are most likely to be deposited. (Committee on Health Effects of Waste Incineration, 2000)

EJSCREEN Report (Version 2019)

6.2 miles Ring Centered at 45.047150,-122.955030, OREGON, EPA Region 10

Approximate Population: 86,625

Input Area (sq. miles): 120.75

Brooks, Oregon

Selected Variables	Value	State Avg.	%ile in State	EPA Region Avg.	%ile in EPA Region	USA Avg.	%ile in USA
Environmental Indicators							
Particulate Matter (PM 2.5 in µg/m³)	7.15	6.63	62	6.6	71	8.3	20
Ozone (ppb)	34.8	34.2	63	35.1	63	43	10
NATA* Diesel PM (µg/m³)	0.461	0.393	59	0.479	50-60th	0.479	50-60th
NATA* Cancer Risk (lifetime risk per million)	30	31	43	31	<50th	32	<50th
NATA* Respiratory Hazard Index	0.47	0.48	42	0.46	<50th	0.44	60-70th
Traffic Proximity and Volume (daily traffic count/distance to road)	610	480	79	500	77	750	72
Lead Paint Indicator (% Pre-1960 Housing)	0.13	0.25	41	0.23	49	0.28	43
Superfund Proximity (site count/km distance)	0.029	0.083	33	0.13	30	0.13	26
RMP Proximity (facility count/km distance)	1.7	0.78	86	0.65	89	0.74	88
Hazardous Waste Proximity (facility count/km distance)	0.23	1.4	37	1.5	41	4	39
Wastewater Discharge Indicator (toxicity-weighted concentration/m distance)	0.00078	0.0056	67	31	73	14	65
Demographic Indicators							
Demographic Index	42%	29%	81	29%	80	36%	65
Minority Population	41%	23%	84	27%	79	39%	60
Low Income Population	42%	34%	68	31%	73	33%	68
Linguistically Isolated Population	8%	3%	88	3%	85	4%	79
Population With Less Than High School Education	18%	10%	84	9%	85	13%	74
Population Under 5 years of age	8%	6%	74	6%	69	6%	70
Population over 64 years of age	14%	16%	45	15%	52	15%	50

The EJSCREEN for various environmental indicators shows that the 6.2 mile (10 km) area surrounding Brooks is worse off than most other locales in Oregon for many indicators, including particulate matter, ozone, diesel particulate matter, traffic proximity and volume, wastewater discharge and RMP Proximity. The RMP is the Risk Management Plan (RMP) Rule from Section 112(r) of the Clean Air Act Amendments, which requires EPA to publish regulations and guidance for chemical accident prevention at facilities that use certain hazardous substances. The RMP rule requires facilities that use extremely hazardous substances to develop a Risk Management Plan. Covanta Marion is such a facility.

The EJSCREEN for the 6.2 mile (10 km) radius of Brooks puts the demographic index (a combination of percent low-income and percent minority) in the 81st percentile for the state, meaning that only 19% of Oregon locales have a larger proportion of low income and minority populations. Each of the demographic subsets of vulnerable populations, with the exception of the elderly, are over-represented in the area of concern around Covanta.

Zapata et al. in their report, “Findings Brief for Equity Considerations for Greenhouse Gas Emissions Cap and Trade Legislation in Oregon,” commissioned in 2017 by the Coalition of Communities of Color, Oregon Environmental Council, and Portland State University Institute for Sustainable Solutions, identified communities most vulnerable to climate change. (Zapata, 2017)

They used the criteria of race (non-white), income (below 200% of poverty), education (% over 25 without a high school diploma), unemployment rate (% age >16 not employed), age (% over 65 or less than 10 years of age), cancer risk and respiratory hazard risk. In the map below, blue areas represent the top 50%, green, the top 25% and yellow, the top 10% of census tracts most vulnerable to climate change. From this map, the area of Brooks, Salem, Keizer, Gervais, and Woodburn all fall in the top 25% (green) area of most vulnerable communities to climate change. Greenhouse gases produced by Covanta Marion is not a trivial issue for these communities and must be considered as part of the hazard posed by this plant.

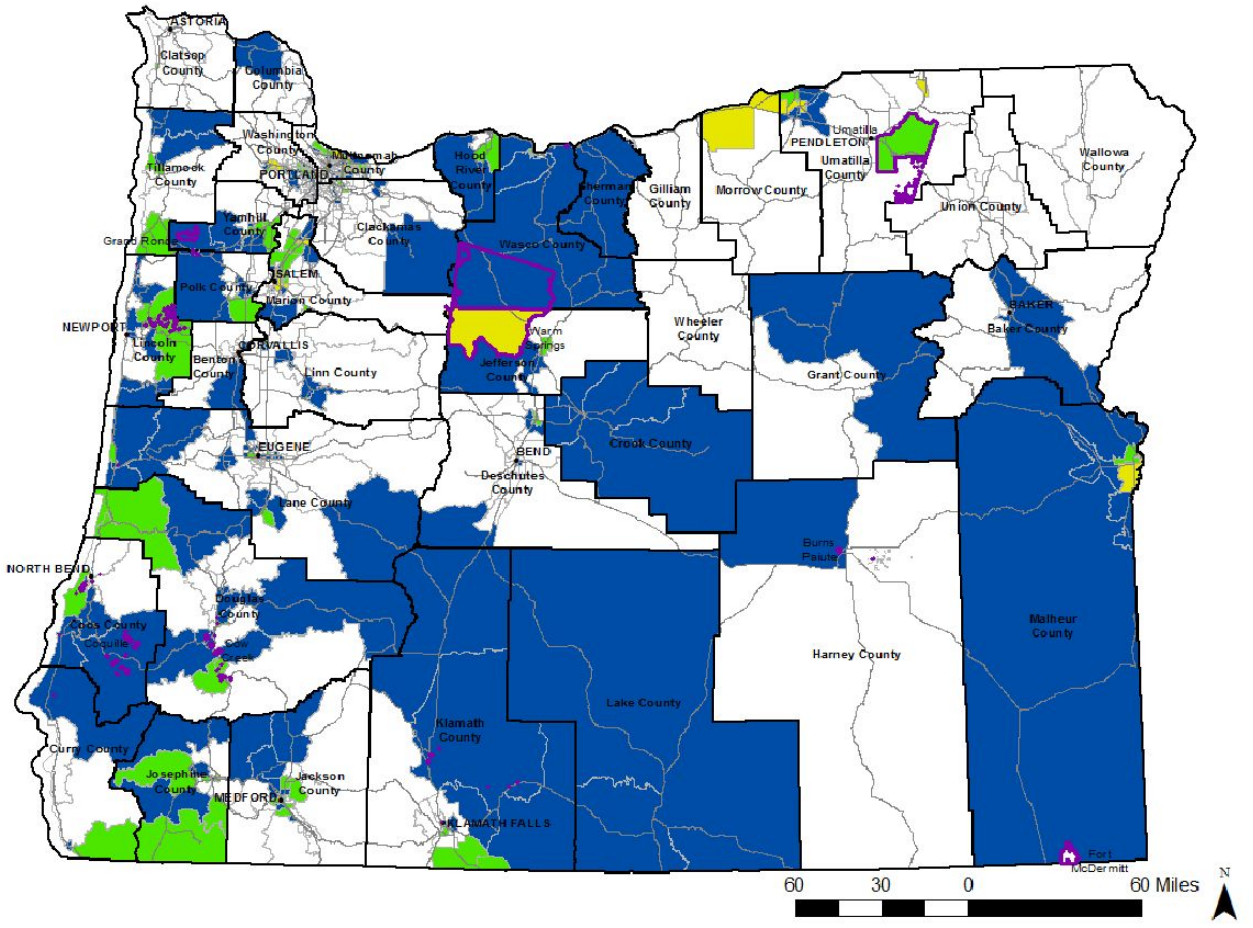

Figure 1*:* Top 10%, 25%, and 50% of Census Tracts Most Vulnerable to Climate Change in Oregon. *GIS data source: US Census Bureau and State of Oregon. Index scores are based on data from: U.S. Census American Community Survey (ACS) 2011-2015 5 year estimates and the National Air Toxics Assessments (NATA) 2011.*

One of the pillars of "environmental justice" is meaningful involvement of all people regardless of race, color, national origin, or income. There does not appear to have been any "meaningful involvement" of the communities impacted or potentially impacted by the pollutants of air, water and soil from Covanta, nor how increased greenhouse gas production and resulting climate warming will adversely affect their health and safety.

Summary Findings:

- Brooks and the surrounding communities, including Woodburn, Gervais, Keizer, and Salem have a higher percentage of persons identifying as Hispanic or Latino than the state overall.
- Brooks has a younger population and several schools in close proximity to the Covanta facility. Children are more likely to be adversely affected by environmental pollutants.
- Woodburn, in particular, is a vulnerable community with many health disparities, including a majority Latino population, a majority who do not speak English at home, higher rates of poverty, lower median income, a younger population, and lower high school graduation rates.
- Marion County, overall, suffers from health disparities including higher rates of children living in poverty, obesity, teen pregnancy, especially among Latinos, and sexually transmitted diseases.
- Air pollution is worse in Marion County than the State as measured by the density of particulate matter in the air.
- Water quality indicators showed that a lower percentage of community water systems were meeting health standards than the state as a whole and are not meeting the Environmental Protection Agency (EPA) target.
- These communities are all in the top 25% (green) area of most vulnerable communities to climate change.
- Woodburn's Refuse Disposal Site received the ash from Covanta until 2015. It is unknown to what extent pollutants from this ash have dispersed into the surrounding air, water and soil and remain there.
- There has been no meaningful involvement of these communities to understand and address their concerns about the adverse effects of air, water, and soil

pollutants as well as greenhouse gas emissions from Covanta Marion, Inc. on their health and safety.

Regulatory Failures

Confidence in the capacity and will of DEQ to protect the public interest against the interests of for-profit enterprise has significantly eroded. Compared to most other states, environmental regulation in Oregon is unduly influenced by corporate interests. (The Oregonian, 2019) Beyond the financial and political constraints imposed on DEQ by a bought-and-paid-for legislature, DEQ itself has cultivated a cozy relationship with industry. (Forbes, 2016) Regulatory failure has been the result.

Most recently, DEQ failed to compel Zenith Energy in Portland to conduct the appropriate and legally mandated emergency drills for crude oil spills and explosions. (Graves, 2019) In 2007, DEQ awarded Bullseye Glass in Portland an improper exemption to air quality regulations, which resulted in neighborhood contamination by arsenic and other pollutants. (Davis, 2016)

The Cleaner Air Oregon legislation itself was strongly resisted by Oregon business (Hester, 2018) and their interests prevailed when the legislature failed to invest DEQ with the authority and means to conduct an independent and credible evaluation. (Coleman, 2018) The public interest is routinely minimized or ignored in a system that privileges corporate over community well-being. Unfortunately, this already calls into question the results of any Cleaner Air Oregon evaluation.

It is expected that Covanta Marion will be “called in” for a comprehensive assessment in 2020 under a Cleaner Air Oregon process that is already under fire for favoring corporate interests. (Coleman, 2018) (Cascadia Times, 2018) (Davis, Cancer risk doubles in industry-backed toxic air plan for Oregon, 2018) (Environmental Justice and Public Health Groups Oppose SB 1541, 2018). Despite an 18-month-long process of stakeholder input processes to build health-protective standards for the Cleaner Air Oregon program, lawmakers passed a bill that set risk action levels at fifty times the no risk level for cancer rates and a non-cancer hazard index of 5 before the program will allow for additional regulations on most existing facilities that have Toxic Best Available Control Technology (T-BACT) or are regulated federally. This includes Covanta Marion. The existing risk action level standards in Cleaner Air Oregon do not go far enough to protect public health and will not result in the level of scrutiny that polluters like Covanta Marion require.

Health Impacts of Air Pollutants

Particulate Matter: Particulate Matter (PM), is composed of very small, solid and liquid particles, formed from the incomplete burning of fossil fuels, such as coal, diesel, gasoline, and biomass. PM2.5 measures 2.5 microns in diameter or less; PM10 are

particles 10 microns or smaller. PM consists of a complex mixture of Polycyclic Aromatic Hydrocarbons (PAHs), soot, black carbon, absorbed water, aerosolized sulfuric acid droplets, other acids, nitrogen, sulfur, organic material, metals, and other toxic substances. PAHs are absorbed by the sponge-like particles and carried by them deeply into the smallest compartments of the lung (alveoli) where they gain direct access to the bloodstream and may then contribute to various diseases in organs distant from the lungs, including the fetal placenta. (Oregon Physicians for Social Responsibility, 2015)

PM is associated with a host of adverse health effects including:

Cancer

- Increased biological markers associated with risk of lung cancer
- Exposure to ozone and PM correlated with development of and mortality from lung cancer
- Increased oxidative DNA damage predictive of cancer risk
- Increased rates of breast cancer

Cardiovascular

- Increased hospital admissions for serious cardiac arrhythmias
- Increased probability of admission for acute myocardial infarction
- Increased ischemic heart disease, arrhythmias, congestive heart failure
- Biomarkers associated with increased cardiac morbidity and mortality
- Increased hospital admissions and death from heart failure
- Increased risk of congenital cardiac anomalies in children

Cerebrovascular

- Increased hospital admissions for strokes
- Significant increase in stroke mortality associated with exposure to particulate matter
- Increased risk of stroke associated with combined exposure to particulate matter, black carbon, and nitrogen dioxide
- Increased risk of stroke and death from stroke for post-menopausal women
- Structural brain damage and cognitive deficits in middle-aged and older adults

Neurodevelopmental

- Increased incidence of autism spectrum disorder
- Increased incidence of behaviors associated with attention deficit hyperactivity disorder
- Lowered IQ
- Increased behavioral symptoms of anxiety, depression, social problems, rule breaking, and aggression

Pulmonary

- Decreased lung function
- Inhibited lung development in children and adolescents and measurable airway inflammation
- Increased asthma rates and worsening of preexisting asthma and chronic obstructive pulmonary disease (COPD), resulting in increased hospitalization

Other

- Long term exposure linked to decreased life expectancy from cardiopulmonary mortality
- Prenatal exposures linked to altered immune system development

(Oregon Physicians for Social Responsibility, 2015)

Nitrogen oxides (NO_x): NO_x gases react to form smog and acid rain as well as being central to the formation of fine particles (PM) and ground level ozone, both of which are associated with adverse health effects. Some effects of short-term exposure to NO_x are independent of the effects of many other traffic-related pollutants.

Short term exposure to NO2 can cause respiratory impairment and asthma exacerbation. Long-term exposure to NO2 is also associated with respiratory effects, particularly the development of asthma in children.

Short-term exposure to NO2 may also be associated with:

- cardiovascular effects and
- premature mortality

Long-term exposure may also be associated with:

- cardiovascular effects
- diabetes
- poorer birth outcomes
- premature mortality
- cancer

However, it is uncertain whether NO_x exposure has an effect on these health outcomes that is independent from the effects of other traffic-related pollutants. It is not clear whether there is an exposure concentration of NO_x below which effects do not occur. (National Center for Environmental Assessment-RTP Division, 2016)

Sulfur dioxide (SO_2): Exposure to sulfur dioxide affects the respiratory system. High levels of acute exposure cause:

- Burning of the nose and throat
- Breathing difficulties
- Severe airway obstruction

Long-term exposure to persistent levels of sulfur dioxide can affect lung function. Asthmatics have also been shown to be sensitive to the respiratory effects of low concentrations of sulfur dioxide. Long-term studies surveying large numbers of children indicate that children who have breathed sulfur dioxide pollution may develop more breathing problems as they get older, may make more emergency room visits for treatment of wheezing fits, and may get more respiratory illnesses than other children. Children with asthma may be especially sensitive even to low concentrations of sulfur dioxide.
(National Center for Environmental Assessment—RTP Division, 2017)

Mercury (Hg): Mercury is a potent neurotoxin, ranking third on the 2011 Agency for Toxic Substances and Disease Registry (ATSDR) priority list of 275 hazardous substances. Mercury concentrates in fetal blood as it crosses the placenta. Neurotoxin effects may be increased by synergistic action when mercury combines with other common environmental toxins (such as lead, manganese, PCBs, pesticides, etc.) which are often present in the bodies of children. Prenatal exposure causes disruption of brain development by inhibiting critical neuronal and glial cell division, global disruption of neuronal migration and by disruption of the endocrine system and is associated with:

- Autism
- Attention deficit hyperactivity disorder
- Smaller cerebellar volume
- Poorer visual recognition
- IQ decline
- Decreased vocabulary
- Decreased visual motor ability
- Decreased general cognition, memory and verbal skills

(Oregon Physcians for Social Responsibility, 2014)

Arsenic: Arsenic affects every system in the body. Arsenic is absorbed through the lungs when inhaled. Small particulate matter, acting as a sponge, transports the arsenic compounds and other soluble metals into the smallest chambers of the lung where they can be directly absorbed into the bloodstream.

Recent studies confirm linkages with low dose effects, including cardiovascular effects; increased incidence of metabolic disorders, including diabetes; decreased lung function; impaired immune functions and increased infections**.**

Arsenic also acts as a generalized neurotoxicant. Effects on the developing fetus, infants, and children at very low exposure levels point to arsenic's role in epigenetic changes in the programming of fetal development and later neurodevelopment. There is also evidence for an endocrine disruption mechanism.

Early life exposures increase risk for:

- Later development of cancer of the liver, skin, bladder and lung; this risk is greater than that of exposure to arsenic as an adult.
- Decreased cognitive ability (IQ); the combination with high levels of lead is particularly damaging
- Birth effects, low birth weight, higher infant mortality and decreased fetal growth
- Increased risk of infection in infants
- Other impaired immune response issues
- Neurobehavioral effects: development of behavioral disorders

(Oregon Physicians for Social Responsibility, 2016)

Cadmium: Cadmium is a highly toxic metal with a very long half-life of 20-30 years in humans and accumulates in soft tissues, kidneys, and the liver. Evidence suggests that cadmium affects DNA repair, and cell signaling and control. These effects lead to kidney damage, cancer, mutations, damage to hormone regulating mechanisms, reproductive disorders, and problems with cellular differentiation.

Cancer:

- Bladder
- Breast
- Pancreas

Bone health:

- Exposure to low concentrations of Cadmium is associated with effects on bone, including increased risk of osteoporosis and fractures
- Cadmium was implicated in Itai Itai disease due to industrially contaminated water in people exposed, especially women. They suffered osteomalacia (softening of the bones) and osteopenia (decreased bone mineral content and density)

Neurodevelopmental:

- Children who have higher urinary cadmium concentrations may have increased
  risk of both acquiring a learning disability and being more likely to receive special education, at exposure levels that were previously considered to be without adverse effects, levels that are common among U.S. children
- 1.53 times higher risk for emotional problems with a twofold increase in cord blood cadmium
- Early-life low-level cadmium exposure associated with lower child intelligence scores

Endocrine/Reproductive and Other Effects

- Cadmium mimics estrogen, so is an endocrine disrupting chemical. It affects male reproduction in animal studies, and causes decreased birth weight in humans.
- Possible effects on cellular aging; cadmium exposure at environmental levels was related to leukocyte telomere length (a marker of cellular aging).

(Oregon Physicians for Social Responsibility, 2105)

Hydrogen Fluoride (also known as fluoric acid, hydrofluoride, hydrofluoric acid, and fluorine monohydride): Hydrogen fluoride is a serious systemic poison. It is highly corrosive. Its severe and sometimes delayed health effects are due to deep tissue penetration by the fluoride ion. The surface area of the burn is not predictive of its effects. The systemic effects of hydrogen fluoride are due to increased fluoride concentrations in the body which can change the levels of calcium, magnesium, and potassium in the blood.

Most hydrogen fluoride exposures occur by inhalation of the gas and dermal contact with hydrogen fluoride. Symptoms may be delayed for several days, especially in the case of exposure to dilute solutions of hydrogen fluoride (less than 20%). Absorption of substantial amounts of hydrogen fluoride by any route may be fatal.

Adverse effects include:

- Severe skin, eye, and mucous membrane irritation
- Respiratory tract irritation and hemorrhage
- Nausea, vomiting, gastric pain
- Cardiac arrhythmia
- Destruction of deep tissues when fluoride ions penetrate the skin
- Hypocalcemia, which leads to tetany, decreased myocardial contractility, and possible cardiovascular collapse
- Hyperkalemia has been suggested to cause ventricular fibrillation leading to death.

(Agency for Toxic Substances and Disease Registry, n.d.)

Dioxins/Furan and Dioxin-like Polychlorinated biphenyls (PCBs): The dioxins and furans are not manufactured or produced intentionally but are by-products in the manufacture of other chemicals or products. Dioxins form whenever chlorine-containing compounds are burned or treated with catalysts in the presence of organic material. Prior to industrialization and the introduction of chlorine, dioxin existed naturally only in very small amounts. Today it enters the air from thousands of sources including incinerators that burn medical, municipal, and hazardous waste, chemical processing facilities that use chlorine to make products such as pesticides and PVC

plastic, chlorine bleaching of pulp and paper, manufacturing or processing of certain types of chemicals, such as pesticides, and metal refining and smelting operations. Until banned in 1979, PCBs were manufactured as insulator fluids in heat-exchangers and transformers, as hydraulic fluids, and as additives to paints, oils, and caulks. (Centers for Disease Control and Prevention, 2017)

Airborne dioxin can travel great distances, eventually settling onto soil, plants, and water. Dioxin dissolves readily in oils, fats, and organic solvents but poorly in water and it does not evaporate readily. Since dioxin does not react with oxygen or water and is not broken down by bacteria, it persists in the environment for long periods of time, making it a "persistent organic pollutant." (The Endocrine Disruption Exchange, n.d.)

Dioxins are a family of 75 chemically related compounds commonly known as chlorinated dioxins. Furans are a family of 135 chemicals. Exposure to both occurs by inhalation, ingestion, and skin contact. Dioxins persist in the environment and most attach to soil and to sediment in water, and bioaccumulate. (Centers for Disease Control and Prevention, 2017) 2,3,7,8-TCDD is the most toxic of the chlorinated dioxins and is a known carcinogen. (National Toxicology Program, 2016)

TCDD and the related PHAHs (polyhalogenated aromatic hydrocarbons) modulate the levels of many hormonal systems. Alteration of hormones has long been known to affect development. Dioxins cause a spectrum of morphological and functional developmental deficits including:

- Fetal death
- Thymic atrophy
- Birth defects (structural malformations)
- Delayed effects on the genitourinary tract
- Adverse behavioral effects
- Developmental delay

Recently, hormonal and neurological abnormalities have been reported in infants from the general population. The complex alteration of multiple endocrine systems is likely associated with the spectrum of adverse developmental effects caused by dioxin and related compounds. (Birnbaum, 1995)

Evidence mounts for other detrimental health effects of dioxins in humans, including diabetes and developmental delays. (DeVito, 2002)

Health effects from PCB exposure include:

- Neurologic disorders
- Cancer
- Liver toxicity
- Immunosuppression

- Endocrine disruption such as low thyroid (which can also affect a developing embryo)
- Impaired reproduction

Prenatal exposure is associated with:

- Neurological impairment
- Learning disabilities
- Poor memory
- Reduced IQ
- Behavioral issues such as poor impulse control and disorganization
- Attention Deficit Hyperactivity Disorder
- Autism

(Oregon Physicians for Social Responsibility, 2014)

Conclusion

We, the undersigned, respectfully request that DEQ deny this Title V Air Quality Permit Renewal until Covanta Marion has undergone the Cleaner Air Oregon review process. Furthermore, a study of contaminant spread, health impacts, and greenhouse gas emissions should be conducted by disinterested third parties. Finally, a public hearing should be held to receive input from communities impacted by the pollution at Covanta Marion.

Sincerely,

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