

Rachel's Environment & Health News

#236 - Emissions Into The Local Environment From A Hazardous Waste Incinerator

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The production of hazardous waste in the U.S. continues to grow at 5.5% per year, thus doubling every 12 or 13 years. This means that, during the lifetime of a person born today, the amount of hazardous waste produced each year will increase 45-fold. For every ton of hazardous waste being produced in the U.S. today, 45 tons will be produced 70 years from now if present rates of growth continue.

U.S. Environmental Protection Agency (EPA) has responded to this situation two ways: First, EPA has declared that one technology can solve all waste problems: incineration. "A well-operated incinerator can destroy hazardous waste safely," EPA says flatly.[1] Obviously if this is true, the problem of hazardous waste has been solved, assuming a few honest and competent people can be found to operate incinerators well.

Secondly, however, speaking from the other side of its mouth, EPA says "Environmental programs that focus on the end of the pipe or the top of the stack, or on cleaning up after the damage is done, are no longer adequate. We need new policies, technologies and processes that prevent or minimize pollution--that stop it from being created in the first place." [2] Thus, somewhere deep in its innards, EPA seems to recognize the need for waste reduction and pollution prevention.

Unfortunately, in the struggle between these two viewpoints within EPA, pollution prevention is not faring well. EPA's "blueprint for a comprehensive pollution prevention strategy" relies entirely on voluntary efforts by industry. Industry's program to increase the incineration of wastes, on the other hand, is being carried out with active and enthusiastic support from EPA. Collaboration between EPA and the regulated community is so close that a phrase has been coined to describe it--"regulatory-industrial complex"--an open alliance between the regulators and the regulated to promote the burning of waste in cement kilns, industrial boilers, and hazardous waste incinerators wherever possible. EPA is so eager to promote this technology that the agency has threatened to cut off all Superfund cleanup money from those states that refuse to install sufficient incineration capacity to burn all wastes that might be created during the next 20 years. Instead of urging states to initiate mandatory waste-reduction programs that would control the growth of wastes during the next 20 years, EPA is instead forcing states to build incinerators. (See RHWN #142.) Clearly EPA is in a conflict-of-interest position as an enthusiastic proponent of incinerators and the nation's only agency with responsibility for controlling the public health effects from incinerators.

Over 57 billion pounds of hazardous wastes are burned each year in U.S. incinerators, cement kilns and industrial boilers.[3] Ironically, less than 5 percent of this waste is burned in officially-licensed "hazardous wastes incinerators"--more than 95 percent is blended with fuel oil and burned as fuel in kilns and boilers where it is not being "disposed of" but is being "recycled" in the view of EPA.

According to the best available information on hazardous waste incineration,[4] an average-sized incinerator (burning 35,000 tons of waste each year) releases the following quantities of hazardous wastes into the local environment:

Unburned wastes: A certain amount of organic waste passes directly through a hazardous waste incinerator and is emitted, unburned, from the smoke stack. By law, a hazardous waste incinerator is designed to achieve 99.99 percent destruction of organic waste; another way to say this is, by law, a hazardous waste incinerator is designed to release 0.01 percent of its organic waste through the smoke stack. This means that, by design, 7000 pounds of unburned wastes are emitted from the stack of an average-sized (35,000-ton-per-year) incinerator. The estimate of 7000 pounds is based on the assumption that the incinerator operates perfectly during every minute of its 20-year-plus operation. Actual measurements indicate that, in the real world, operating incinerators are more likely to emit 70,000 pounds or perhaps even as much as 700,000 pounds of unburned waste into the local environment each

year.

According to the EPA's Science Advisory Board, spills and leaks can be expected to release an additional 7,000 pounds of unburned wastes directly into the local environment.[5]

Additionally, an estimated 63,000 pounds of unburned wastes will be released into the environment with the discarded pollution control device effluent (scrubber water).[6]

Thus the total estimated unburned wastes reaching the local environment each year is 77,000 pounds.

Heavy metals emitted from the smoke stack: The average metals content of hazardous waste in the U.S. is 1.5 percent, so an average 35,000-ton-per-year incinerator will burn 1,050,000 pounds of metals each year. Many of these metals are toxic, such as lead, cadmium, chromium, nickel, arsenic, thallium, mercury, beryllium, antimony and 8 other metals commonly found in hazardous waste. Metals are not destroyed in an incinerator; about 19% of them (204,000 pounds) will go up the smoke stack, an additional 171,000 pounds will be discarded with the scrubber water, and 672,000 pounds will be discarded with the 6.3 million pounds of ash created each year. Like unburned wastes, metals that go up the stack will be distributed into the local environment immediately, becoming available to enter food chains. The scrubber water and the ash will eventually also make their way into the environment, wherever they are discarded.

Products of incomplete combustion (PICS): Under ideal burning conditions, an organic hazardous waste will be converted into pure carbon dioxide, pure water and a relatively-harmless salt. In a laboratory, it is possible to set up nearly-ideal conditions for burning a single chemical and thus "destroy" it completely. Unfortunately, it is the nature of wastes that they are not pure chemicals; wastes include many chemicals mixed together (if they weren't mixed they wouldn't be wastes at all--they'd be valuable products). Since each chemical has unique ideal conditions for burning, it is impossible to achieve ideal burning conditions for all the components of a mixed waste. For example, raising the temperature to destroy one chemical may actually make it harder to destroy another chemical and may also force more metals out the smoke stack. Because of this, burning waste always creates partially-burned chemicals which can then turn into new chemicals inside the combustion chamber.

Think of a lump of bread dough. Leave it in a hot oven and it starts to turn brown. Leave it longer and parts of it turn black. Test those black parts and you'll find chemicals that didn't exist at all in the original dough. These new chemicals are PICS, or products of incomplete combustion. In the case of bread, PICS taste bad. In the case of hazardous waste incineration, PICS can be much more toxic than the original chemicals from which they were derived. The amount of PICS emitted from the smoke stack of an incinerator is just under 1% of the weight of the waste going in--or about 693,000 pounds in the case of a 35,000-ton-per-year incinerator. Unknown --but substantial --quantities of additional PICS will be discarded with the ash.

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[1] U.S. Environmental Protection Agency, PERMITTING HAZARDOUS WASTE INCINERATORS [EPA/530-SW-88-024] (Washington, DC: U.S. EPA, Office of Solid Waste, April, 1988), pg. 1.

[2] U.S. Environmental Protection Agency, "Environmental Protection Agency Pollution Prevention Strategy," FEDERAL REGISTER Vol. 56 No. 37 (Feb. 26, 1991), pg. 7849. Available free by phoning EPA at (202) 382- 2736 in Washington, DC.

[3] "US hazwaste market to double by 1995?" HAZNEWS No. 37 (April, 1991), pgs. 12-13. [Haznews is an industry publication originating in London, England.]

[4] Pat Costner and Joe Thornton, PLAYING WITH FIRE; HAZARDOUS WASTE INCINERATION (Washington, DC: Greenpeace, 1991). Available to activists for \$10 and to industry for \$100 from Greenpeace, 1436 U St., NW, Washington, DC 20009.

[5] EPA cited in Costner and Thornton, cited above, pg. 21.

[6] Estimated in Costner and Thornton, cited above, pg. 20.

Descriptor terms: hazardous materials; incineration; epa; voluntary emissions-reduction program; monitoring; regulation; cement kilns; pics; spills; leaks; heavy metals; toxic substances; scrubbers; pollution prevention; waste avoidance;