

## **Landfill Disamenities And Better Utilization of Waste Resources**

### **Presented to the Wisconsin Governor's Task Force on Waste Materials Recovery and Disposal.**

May 10, 2006 - Madison, Wisconsin by: Jack D. Lauber, PEDEE, Latham N.Y.

[www.jlauber.com](http://www.jlauber.com)

Consultant, Columbia University Earth Engineering Center, New York N.Y.

I would like to thank Mr. Vogel and others of your Wisconsin Governor's Task Force on Waste Materials Recovery and Disposal who have invited me to address you today on landfill disamenities and better utilization of waste resources. I'd like to give you an overview of where we've been and where we're heading, or should be heading regarding solid waste disposal.

I began my environmental engineering career in New York State in the 1960's. We had many problems with polluting solid waste dumps, landfill fires, leaking landfills, air emissions, etc. Most dumps were shut down.

We next had several poor municipal solid waste incinerators that were not properly controlled and caused air pollution problems. The dioxin emission problem was first discovered in Long Island, New York in 1980. The Clean Air Act and new air pollution control regulations resulted in the closing of these older polluting waste incinerators. I shut down several of them.

We next had sanitary landfills with daily cover and later, with plastic liners and leachate collection. What are the disamenities, the environmental liabilities of these municipal solid waste landfills?

We recently completed a paper that will be presented at the Annual Meeting of the Air and Waste Management Association in New Orleans, Louisiana next month, "Comparative Impacts of Local Waste to Energy vs. Long Distance Disposal of Municipal Waste," a study of landfill emissions vs. waste to energy, WTE facilities. We know that municipal solid waste, MSW landfills in the US are estimated to release approximately 14,300 tons per year, of non-methane organic compounds in addition to vast amounts of methane, which is a potent greenhouse warming gas, 21 times as potent as carbon dioxide. USEPA emission factors show about 46 chemical compounds, many of which are toxic, coming from landfills. Over 20 of these are halogenated toxic organic compounds. We know that these emissions pose considerable health risks to nearby residents, and, when they're flared or burned for disposal, can form uncontrolled dioxin, furan toxic air emissions. I recently saw an exhibit of a landfill gas carbon adsorber designed to remove siloxanes and air toxics from landfill gas prior to engine burning, to reduce wear on the engine. They later stripped the carbon of contaminants to clean it, and flared the toxic gases without any controls. I'm told this is a common practice. Most landfill gas energy combustion systems are uncontrolled.

In 1998, a New York State Health Department Report on effects from municipal solid waste landfills reported women living near studied landfills where gas is migrating, have a four-fold increased chance of bladder cancer or leukemia. Dr. Jean Munro, an environmental health physician in England has further reported on the problems of multiple chemical sensitivity and adverse health effects to those living near landfills.

We also know that the diesel trucking of waste over long distances, especially the interstate shipment of MSW to landfills, generates dioxin emissions; and that these emissions are increasing as the sulfur content of diesel fuel decreases. We also know that polycyclic aromatic hydrocarbon emissions, PAH's which are carcinogenic, are emitted from most diesel trucks.

Large quantities of fuel are used to transport MSW to distant out of state landfills. NY City wastes about 5 million gallons of diesel fuel per year doing this.

Recent health risk studies have shown, health risks for exposure to the various toxic emissions from solid waste landfills were 41 in a million, and that overall health risks from landfill gas emissions are 30 times worse than those from a state-of-the-art waste to energy plant.

There is much concern about greenhouse gas warming today. Dr. Eschenroeder of the Harvard School of Public Health performed computer studies that show when one compares the atmospheric modeling of greenhouse gas emissions from both MSW landfills and combustion systems over the life cycle of a landfill, that the time-integrated radiative forcing from landfilling was estimated to be 115 times that of combustion. When there is active gas collection at the landfill, the landfill still has a 45 times greater greenhouse gas atmospheric emission effect than a WTE combustion system.

There are many household hazardous chemicals, industrial and illicit hazardous wastes that are occasionally disposed in landfills. No one fully understands all the chemical reactions that produce these toxic gaseous emissions. However, the 46 air toxics identified by USEPA point to this problem. We know that vinyl chloride comes from the illicit disposal and anaerobic decomposition of perchloroethylene dry cleaning waste; it is toxic and highly carcinogenic. The best landfill liners will eventually leak from some of these chemicals that are disposed of in landfills, and can pose groundwater pollution risks in the future. Acetone from nail polish remover, can burn a hole through a polyethylene liner in time.

Are we leaving toxic time bombs in our landfills for our posterity? Because of toxic emissions, global warming, and the ruining of lands for future generations, the European Union has recently banned the use of landfills for municipal solid waste.

A student that I've been advising at Columbia, has recently reported on the problems of landfill fires. There are over 8,000 per year reported in the US; most are unreported. Finnish scientists have studied this problem and actually taken samples of gases from smoldering landfill fires, finding massive dioxin, furan toxic emissions from such landfill fires, similar to that from the improper open burning of MSW.

Several years ago, I visited a friend in western PA near massive landfills. I smelled burning garbage and had to shut the windows. The locals open burned their wastes because they couldn't afford to send them to the high priced landfills that were reserved for NY City MSW. NY City spends about \$125 per ton to landfill their MSW in PA and VA. Palm Beach County FL has a \$28 per ton tipping fee, where the costs are kept low because of their WTE facility.

We should view our municipal solid wastes as a renewable resource. MSW has about half the energy of coal. Why are we wasting energy by burying our wastes? Modern high efficiency, multi-stage controlled waste to energy is not waste incineration of the past. Most every current waste to energy plant has 99.9% combustion efficiency, computerized controls, multi-stage air pollution control systems, and achieves substantial energy recovery. There is generally the possibility of receiving about \$50 per ton of municipal solid waste in a WTE plant generating electricity.

We have to develop a paradigm change. The 17<sup>th</sup> Century French Philosopher, LaBruyere said, “the exact opposite of what is generally believed is often the truth”. Modern waste to energy systems will enable us to use our wastes as a renewable fuel resource. The European Union, USEPA, and 15 states recognize the bio-fraction of municipal solid waste as a renewable fuel. Waste to energy can significantly reduce our dependence on foreign fuels and help us to achieve energy independence. Europe and Japan, for example, with several hundred modern WTE facilities with negligible emissions, provide heat and electricity for millions of people. The German Green Party, which opposed the poor waste incinerators of the past, has now endorsed clean waste to energy solutions. Dioxin emissions are no longer a concern from European, Japanese, and U.S. WTE facilities, and have been reduced by more than 99% to negligible, safe levels.

Last May in Toronto, Canada, I was the keynote speaker at a solid waste conference and also debated Dr. Paul Connett, GreenPeace’s top environmental scientist. I used to be his mentor when we were concerned about controlling poor incinerators in the 1980’s. He reluctantly admitted that waste to energy can be now safe, although he favors zero waste solutions, which are not possible.

The best available control technology, BACT WTE plant in LaCrosse, Wisconsin is far cleaner than most coal burning plants, such as the old, poorly controlled system right here in Madison that has circa 1960’s controls.

Wisdom is not knowing what lies ahead, but rather what comes next. We’ve recycled our municipal wastes for over a quarter of a century. We only see about one-third recycling because of practical and economic reasons. Some promote zero waste which is not really possible. Our goal should be zero waste disposal, with the proper utilization of our solid wastes for energy recovery, using the best control technology. Waste to energy should be recognized for what it does well, converting solid waste into clean usable energy and recycled by-products, such as aggregate and bricks for construction. We can produce energy from our solid wastes with negligible emissions, comparable to those of a few motor vehicles driving by. We should stop trucking our MSW to distant landfills that emit greenhouse gases, spoil vast tracks of green fields, and pollute our air with toxic emissions from diesel trucks that waste precious fuel oil. By promoting renewable energy recovery from biofuels in our wastes, rather than burying it in landfills, we can lessen our reliance on unstable or hostile nations that can economically hold us hostage due to our dependency on fossil fuels for energy. Let’s now plan to take proper action to best protect our environment and conserve our energy resources.

Jack Lauber, May 10, 2006