

Attachment B: Examination of the Board's Claim of "No appreciable difference in toxic emissions"

The Report states: "Advocates [of using tires as fuel] point to extensive regional and national testing that bears out the position that tires, in a properly run facility, generally burn cleaner than the coal fuel they usually displace" (CIWMB, 1999; pp. 55-56). The Board and the Scrap Tire Management Council have repeatedly claimed, since the Board's 1992 report to the legislature¹, *Tires as a Fuel Supplement: Feasibility Study*, that burning tires is not only safe but that it is environmentally beneficial when it replaces coal. Here is the key statement from the 1992 report and my summary table of emissions results:

Use of tires in cement kilns replaces coal. That means the coal does not have to be mined or transported and, **if the emissions are equivalent**, an overall environmental benefit is realized because the tires are consumed in a manner that releases no residue. Emissions tests at two California cement kilns burning waste tires with coal fuel **showed no appreciable difference in toxic air contaminant emissions when compared to burning coal fuel only**" (emphasis added; CIWMB, 1992; Executive summary p. xiii, and p. 59).

Appendix B to the Board's 1992 report, however, contains data from emissions testing at two cement kilns that contradicts the Board's assertion of "no appreciable difference." I have summarized (see Table A.1. below) the emission rates and percentage change for 12 of the toxic pollutants on the state's Toxic Hot Spots list for tests conducted at the cement kiln of RMC Lonestar Cement, Davenport, CA, April 17-18, 1990 and Dec 4-7, 1990. These tests compared emissions when 20% of the coal fuel was replaced by waste tires (the December test) against emissions from burning coal only (the baseline, obtained in the April test). A (+) sign indicates an increase in emissions when burning tires with coal compared to the baseline (coal-only).

Table A.1. Emission rate of toxic compounds from RMC Lonestar Cement, comparing burning coal only (the baseline) with burning coal plus tires (tires at 20% of fuel).

Compound	Emission Rate (lbs/hr) ²		%change
	Coal-only	Coal+Tires	
Benzene	9.0E-02	4.03E-01	+ 348%
Dioxins/furans	4.4E-09	5.50E-09	+ 25
Formaldehyde	11.8E+00	5.07E-01	- 96
PCB	9.0E-06	2.88E-04	+ 3,100
Anthracene	3.3E-06	7.56E-05	+ 2,191
Benzo(a)anthracene	6.2E-06	3.65E-05	+ 489
Dibenzo(a,h)anthracene	4.3E-07	1.22E-04	+28,272
Fluoranthene	1.6E-05	5.36E-05	+ 235
Cadmium	1.7E-03	1.25E-04	- 93
Chromium (hexavalent)	5.5E-06	6.31E-05	+ 1,047
Lead	1.1E-03	5.27E-03	+ 379
Mercury	2.1E-01	1.06E-06	- 99+

The claim that there was “... no appreciable difference in toxic air contaminant emissions” (CIWMB, 1992; Executive Summary and p. 59) clearly cannot be supported by the data. Subsequent material published by the Board and by the Scrap Tire Management Council (STMC) repeat the claim, “...that TDF emissions are not a problem,” and assert that using tires as fuel produces an environmental benefit.³ An examination of test burn emissions by Carman⁴ shows large increases in important categories of toxic emissions— dioxins and furans, polycyclic aromatic hydrocarbons (PAHs), and heavy metals -- in some tests. My examination of test burns in California confirms Carman’s data, and leads me to conclude that the claim that “...TDF emissions are not a problem” is a policy judgment that cannot be supported on rigorous scientific grounds.⁵

Notes to Attachment B

Footnotes to Attachment B

1. California Integrated Waste Management Board, *Tires as a Fuel Supplement: Feasibility Study*, Report to the Legislature, Sacramento, CA: January 1992.
2. I use the same scientific notation as in the original table, Appendix B, pp. 71-72 of the CIWMB's 1992 report, *Tires as a Fuel Supplement*; for example, 7.56E-05 can be written as 7.56×10^{-5} or 0.0000756. Also, note, for example, that 2.88E-04 is equal to 288.0E-06 and that this number is 32.0 times greater than 9.0E-06 (an increase of 3,100 percent).
3. See Michael Blumenthal and John Serumgard, "Scrap Tire Markets," *Resource Recycling*, March 1996, p. 16.
4. Carman, Neil J., Clean Air Programs Director for Sierra Club, Lone Star Chapter, Austin, TX. Letter to Citizens for a Better Environment and Desert Citizens Coalition, regarding California Portland Cement Co. Proposal to Burn TDF, (November 14, 1995). Also see: I-35 Corridor Cement Kiln Pollution Network "Consensus Statement." [Available from Sierra Club, Lone Star Chapter, P.O. Box 1931, Austin, TX], (July, 1996).
5. See Attachments A and C of this review for further support of my position.

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