

Posting type	Advisory	updated May 2009
Subject	1-in-6-day Cu contamination from foreign samplers	
Module/Species	A/ Cu	
Sites and Periods – Known	ATLA	May 2004 – August 2005
	BADL	January 2002 – September 2004
	BRMA	January 2002 – December 2003
	LABE	August 2005 – January 2006
	PMRF	July – December, 2002; June 2005 – March 2006; November 2007 – April 2008
	ROMA	January 2002 – December 2007
	Potential	Any site not known to be free of Hi-Vol samplers
Recommendation	Screen Cu data generally for periodic concentration patterns	
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Supporting information

IMPROVE samplers are commonly sited with equipment operated by other air monitoring programs, which may include older high-volume particle samplers to monitor toxic metals or other trace species. The pump motors of these “hi-vols” typically employ brushes in contact with the rotating commutator, and mechanical abrasion of the brushes can be a source of suspended Cu particles. IMPROVE samplers employ brushless pump motors, but can collect the emissions of neighboring hi-vols. When the hi-vol operates on a typical 1-in-6 or 1-in-12 day cycle, contamination of IMPROVE samples may be apparent as an alternating pattern of Cu concentrations. This is evident in the figures below, which distinguish “even days” (1/2/2002 is the first of these plotted) from “odd days”. Data taken before 2002 have not been systematically screened for this 1-in-6-day signal.

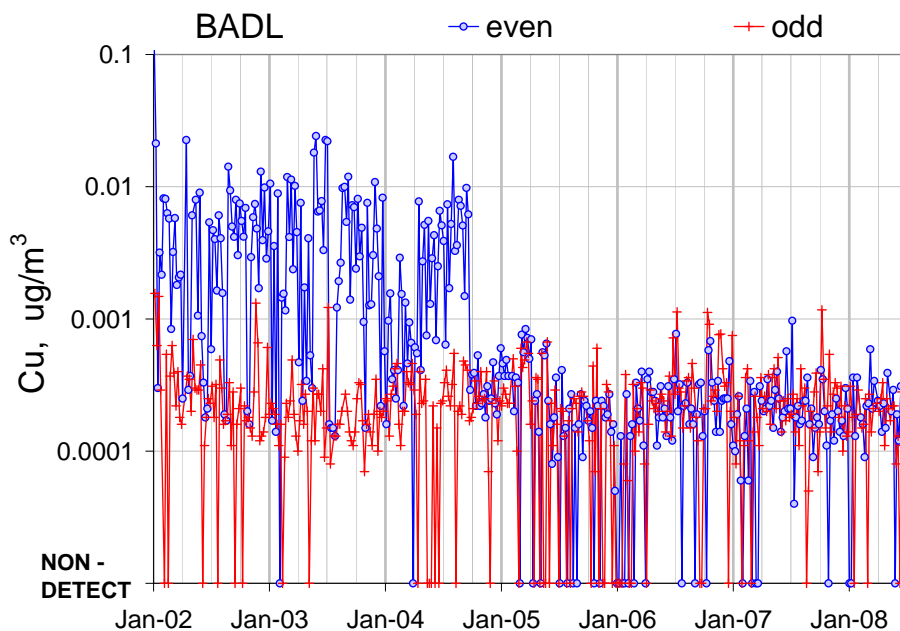


Figure 1. At Badlands NP, replacement of a hi-vol by a modern low-volume PM₁₀ sampler in late 2004 provided a final solution to 1-in-6 day interference.

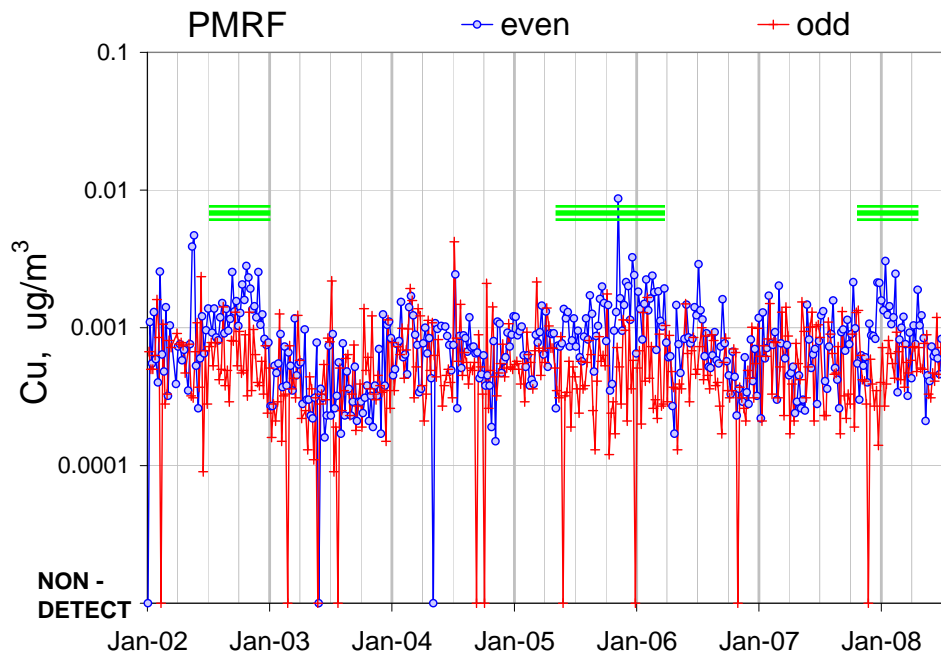


Figure 2. A hi-vol at Proctor Maple Research Forest is fitted with an exhaust hose to duct contamination away from its own and other intakes (Rich Poirot, personal communication). Green bars above highlight periods in which sustained alternations in concentration suggest lapses in the effectiveness of this solution. Note, however, that the even-day concentrations are always lower than those from the uncontrolled installations at BADL (above) or ROMA (below).

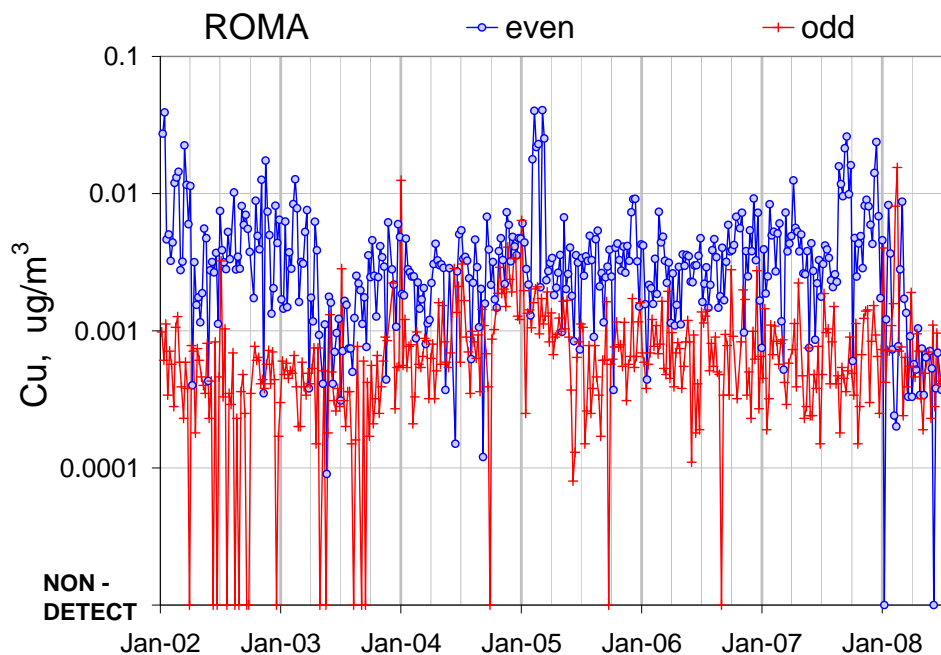


Figure 3. Retirement of a hi-vol in 2008 resolved a long-standing interference at Cape Romain NWR.