ESTABLISHED 1802
E. I. DU PONT DE NEMOURS & COMPANY
INCORPORATED
WILMINGTON, DELAWARE 19898

ENGINEERING DEPARTMENT
LOUVIERS BUILDING

bcc: E. S. Jacobs-PD-Pet Lab
R. W. Kennard-ESD-L2305
D. W. Marquardt-ESD-L3161
C. G. Pfeifer-ESD-L31E55
IC 31 - Applied Statistics

March 10, 1982

Dr. Stephen D. Walter
Department of Epidemiology and Public Health
School of Medicine
Yale University
P.O. Box 3333
60 College Street
New Haven, Connecticut 06510

Dear Dr. Walter:

Thank you for your letter of March 1, 1982, concerning the relationship between blood lead and air lead. I offer two comments for your consideration. While I agree that the log(blood lead)-air lead relationship is appropriate for the Silver Valley Study, it is the only study that I am aware of in which such a relationship has been derived. All the other relationships I have seen appear to be either linear (probably because of the small air lead range covered) or "log-log like." I do not believe that the strict use of the log-log model is appropriate, however, because of its mathematical characteristics at low lead levels (eg, the model is not defined at air lead = 0). I recommend the use of the lead exposure model mentioned in the materials I sent to you.

I also note that a blood lead of 30 µg/dl is what many consider the upper end of the normal range for children and women. Computing blood lead-air lead slopes at higher blood lead levels is not of interest because we want to know what effect air lead has on the blood lead of normal populations.

I do not know whom you should contact within the EPA. I will, however, see if I can identify an appropriate person and contact you at a later date.

Your interest in our work is appreciated. I shall be pleased to keep you informed of any further work we do in this area.

Very truly yours,

ENGINEERING SERVICE DIVISION

Ronald D. Snee

R. D. Snee
Consultant Supervisor
Applied Statistics Group

RDS/gb

Yale University

SCHOOL OF MEDICINE
Department of Epidemiology and Public Health
P.O. Box 3333
60 College Street
New Haven, Connecticut 06510

March 1, 1982

R.D. Snee
E.I. DuPont De Nemours & Co (Inc.)
Engineering Department
Wilmington, Delaware 19898

Dear Dr. Snee:

Thank you very much for the packet of reprints, which I received today. They made most interesting reading. I was particularly gratified to see that you reached very similar conclusions in your 1982 JAPCA paper as we did in the 1980 Archives of Environmental Health paper, inasmuch as differences in the the coding and independent variables used will allow.

I tend to agree that EPA has overestimated the blood/air slope value. However, I think that it has been largely overlooked in the various reports that this slope itself depends on the value of blood lead in the individual person, that is if one believes the regression results using log(blood lead) as the independent variable. Thus if one takes the log(blood lead)/air slope to be 0.04 (roughly), then this gives a blood lead/air slope of about 1.2 at modest blood levels around 30 ug, but a slope of 2.5 or so for persons with elevated blood lead at about 60 ug, say. I realize the importance of trying to get an overall figure for the slope without logs, but, as you say, the "accepted practice" has been to use the log, i.e. to analyse proportional rather than absolute changes in blood lead.

Not having been close to the EPA hearing process at the time, can you tell me if there is anyone there who would be a good person to write to on this point? I would also like to find out about the likely future developments in the regulation process.

I would appreciate it if you would also keep me apprised of any further work you may be doing on this subject.

With best wishes,

Sincerely,

Stephen D. Walter

Stephen D. Walter, Ph.D.
Associate Professor of Public Health
(Biostatistics)

SDW:dv