Preliminary Comments on the PA from Dr. Cliff Davidson

Comments on Chapter 1

Chapter 1 of the PA is generally well written and easy to follow. It is a reasonable introduction to the rest of the PA document.

Page 1-2, lines 21-24 state that a new Risk and Exposure Assessment was found to be unnecessary at this time, and hence the health and welfare REAs developed for the 2006 review are adequate for use with current environmental concentration and exposure data. This is clearly presented and is justified based on our prior committee reviews.

Section 1.3.2 discusses considerations related to the history of Pb emissions during the days of leaded gasoline and high stationary source emissions. The section correctly points out that the current task is to assess the adequacy of the current airborne Pb standard, while recognizing that there is a history of high Pb emissions. But what is missing from this section is an appreciation for the magnitude of the past Pb emissions.

A simple calculation illustrates the point. Figure 3-1 in the ISA (page 3-3) which is repeated as Figure 2-1 in the PA (page 2-3) shows that total Pb emissions in the year 1970 were over 200,000 tons of Pb. The PA should put this value into perspective. If we conservatively pick 10 years of emissions at this level, we obtain about 2 million tons of Pb emitted. Clearly, the total Pb emissions are more than this value. But some of this Pb was carried out of the U.S., where it eventually deposited in the oceans or elsewhere. It is not unreasonable to assume that about 2 million tons of Pb deposited within the boundaries of the U.S. as a very rough value. If this Pb deposited uniformly over the entire land area of continental U.S., around 25 micrograms of Pb would have deposited per cm^2 of surface. This is roughly equal to the natural amount of Pb in the top 1 cm of soil (12.5 ppm = 12.5 micrograms of Pb per gram of soil, or about 25 micrograms per cm^3 assuming a soil density of 2 grams per cm^3). We have thus approximately doubled the amount of Pb in the top cm of soil throughout the continental U.S. It is apparent that soil in some areas, especially urban areas, will contain much more than this, while larger remote areas will contain less.

The point of this calculation is that we do not know the ultimate fate of roughly 2 million tons of Pb deposited during the days of leaded gasoline, a value that dwarfs current emissions. We suspect that most of this huge amount of Pb is now stored in the environment, with significant amounts in U.S. urban areas where population densities are greatest. The fact that we cannot account for this lead constitutes a major uncertainty in our understanding, and it merits a discussion to that effect in the PA.

There is one sentence in need of revision for accuracy, namely on page 1-13 line 35:

“And we recognize that past lead emissions in many situations were well in excess of the current Pb standard.” One cannot compare emissions to an airborne standard. One way to fix this sentence is to write: “And we recognize that past lead emissions in many situations caused airborne lead concentrations far in excess of the current Pb standard.”