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University of Michigan Dioxin Exposure Study

Analysis and Comments

SECTION I : EXECUTIVE SUMMARY

1. **Michigan dioxin blood serum levels are much higher than US national levels.** The U/M compared dioxin serum levels found in Michigan residents against levels measured by the National Health and Nutrition Examination Survey (NHANES) in 2000-2001. To improve the validity of the comparison, the NHANES serum levels measured in 2000-2001 must be adjusted to 2005, the year in which the U/M sampled the blood of Michigan residents. It is believed that the U/M did not adjust the cited NHANES level to year 2005.

On a year 2005 to year 2005 comparison, the median Michigan dioxin serum level measured by the U/M is more than 70% higher than the national median, a difference much higher than the 10% elevation reported by the U/M. In addition, the U/M study also reported dioxin serum levels by other statistical parameters—mean, 95th percentile, and maximum levels. Based on these parameters, Michigan serum levels are 52% to 120% higher than the corresponding 2005 NHANES national levels.

2. **The U/M found that breastfeeding reduces dioxin blood serum levels in women. The U/M claimed that benefits to the infant from nursing outweigh the potential health risks of dioxin exposure.** This is an unsubstantiated claim since the U/M did not measure dioxin levels in infants and did not evaluate the potential health effects of dioxin exposure in infants.

The U/M did not measure dioxin blood serum levels in any Michigan resident younger than 18 years of age. Although not reported by the U/M, NHANES measured dioxin levels in children as young as nine months of age and found a dioxin serum level of 140.4 ppt-TEQ in the 1 to 5 year old age group. This serum level is twice that of 95% of the serum levels found in Michigan adults. Based on the high levels of dioxins found in the Michigan environment, it is expected that many Michigan infants and children have higher dioxin serum levels than the national levels.

- 3. Midland dioxin serum levels were affected by sample location which the U/M has kept strictly confidential.** Dioxin contamination in Midland is centered around the Dow plant. It was anticipated that the sample location would have a significant impact on the serum levels measured in Midland residents. The U/M study did not disclose the exact location of the Midland samples or how the residents were specifically selected. Four of the dioxin blood serum parameters (mean, median, 75th percentile and maximum level) measured in Midland residents were the lowest found in the U/M study.

A comparison of soil dioxin levels found in Midland by the U/M against previous levels measured by the MDEQ and the US EPA suggest that more than 70% of the U/M's samples may have been taken at a distance of two or more miles from the Dow incinerators in neighborhoods with low levels of dioxin contamination. Only 2 out of 31 sampled locations may have been from the heavily contaminated neighborhoods closest to the Dow plant.

- 4. Dioxin blood serum levels found in the Jackson/Calhoun control group are considerably higher than the national levels.** The U/M study selected Jackson and Calhoun counties in southern Michigan to serve as a "control" based on the 100 mile distance from the Dow plant, demographics similar to Midland and Saginaw counties and no known sources of industrial dioxins. The U/M found that the mean serum level found in Jackson/Calhoun residents was 46% higher than the 2005 national mean and that the 95th percentile serum level was 34% higher than the corresponding 2005 national level.

The high blood serum levels that were found in Jackson/Calhoun residents indicate that the two counties may have been affected by dioxin emissions from several regional waste incinerators known to have been in operation prior to and during the U/M study. Jackson/Calhoun serum levels may be indicative of mixed industrial/residential regions in Michigan that have been contaminated by dioxin air emissions but may not be representative of less polluted “background” areas in which dioxin exposure is primarily limited to dietary intake.

5. **“Background” dioxin serum levels in the Midland/Saginaw area are much higher than expected.** The U/M selected locations in Midland, Saginaw and Bay counties unaffected by flooding of the Tittabawassee River and not expected to be contaminated by dioxin emissions from the Dow plant to measure background dioxin levels in the Midland/Saginaw area.

Residents in the Midland/Saginaw “background” zone were found to have the highest mean and the highest 95th percentile dioxin serum levels found in Michigan. Mean serum levels were 76% higher than the 2005 national mean and the 95th percentile level was found to be 87% higher than the corresponding 2005 national level. PCB serum levels, as measured by 95th percentile TEQ_{PCB}, found in this zone were the highest PCB levels found in the U/M study. In addition, high levels of dioxins were found in the household dusts in this study zone. The high levels of dioxin contamination and high serum levels confirm that dioxin contamination in the Midland/Saginaw area is more wide-spread than previously believed.