FORENSIC APPLICATIONS CONSULTING TECHNOLOGIES, INC.

August 17, 2012

John Doe, MD
1234 Main Street
Colorado Springs, CO

Dear Dr. Doe:

Based on our objective sampling, we have determined that your new home that you just recently occupied was contaminated with *d*-methamphetamine hydrochloride prior to your purchase. The contamination was due to demonstrable manufacturing and smoking of methamphetamine by the previous occupant.

We collected surface wipe samples from a total of 15 locations throughout the occupied structure, and combined the samples into three sets of five wipes for quantitative analysis. We observed concentrations of methamphetamine with a finite probability of being some 2,000 times over the lawful limit permitted by the Colorado Board of Health Regulations 6 CCR 1014-3; we observed definitive concentrations of 44 µg/100 cm2.

FACTs has analyzed field data from fully characterized contaminated properties, and we see that the variation of concentrations from the building as an whole usually exhibits a lognormal distribution. As such, geometric standard deviations can be as large as 3.0; this distribution is similar to that reported elsewhere.[1,2] As such, based on three sample analyses we cannot confidently identify the maximum potential levels of methamphetamine in the property, we can confidently state that the property far exceeds regulatory levels permitted in Colorado.

Using standard toxicological body burden considerations, we can roughly estimate doses received for specific targets. Using one such model, based on the concentrations identified in your property and adopting a very conservative (low) contamination level of only 100 µg/100cm2, we have estimated a potential daily dose received for an adult and a child residing in the property.

Available literature supports a LOAEL for *d*-methamphetamine in children in the area of 0.2 mg/kg/day with a NOAEL of approximately 0.1 mg/kg/day.[3] Some studies indicate

[1] Washington State Department of Health: *Summary Results from a Pilot Study to Evaluate Variability and Distribution of Methamphetamine Residue in Remediated Residential Illegal Drug Labs*, as reported in NIOSH Method 9106 (DRAFT)

[2] Martyny JW, Arbuckle SL, McCammon CS, Esswein EJ, Erb N, *Chemical Exposures Associated with Clandestine Methamphetamine Laboratories*, May 10, 2004).

[3] Young GC, Turner RK *CNS stimulant drugs and conditioning treatment of nocturnal enuresis*. Behaviour Research and Therapy 3, 93-101 (1965).

that adults may be more susceptible to the adverse effects of methamphetamine and have reported LOAELs in the range of 0.08 mg/kg/day to 0.2 mg/kg/day. Therapeutic doses for Desoxyn® (*d*-methamphetamine hydrochloride) are reported to start at approximately 0.25 mg/kg/day for a child.

Ignoring all pharmacokinetics and elimination routes, a total dose[4] for an adult male in the property located at 1234 Main Street, Colorado Springs, CO would be approximately 0.04 mg/kg/day. Given the uncertainties associated with the model and exposure scenarios, we would conservatively increase the potential dose received by an order of magnitude to 0.4 mg/kg/day.

When we estimate the dose from a different angle, using exclusively airborne concentrations of methamphetamine that I have measured from my Technicians entering properties with similar contamination levels as those seen in your property, I see good agreement. For this estimate, one of my Technicians was moderately moving about a property with a surface contamination level of 46 µg/100 cm2, and was exposed to 0.2 µg/m3. Presuming 16 hours in the property each day, at a mean metabolic rate of 600 BTU/h, this too equals 0.04 mg/kg/day. Again, applying an uncertainty factor of one order of magnitude, I believe that a reasonable estimation of dose would be approximately 0.4 mg/kg/day.

Unfortunately, my model for a target child at the property indicates approximately 0.18 mg/kg/day, without even applying an order of magnitude for uncertainty. Therefore, a child in the property at a mean concentration of 100 µg/100 cm2 may receive a daily dose near the therapeutic range for Desoxyn.®

Due to these findings, we recommend that the child's exposure to methamphetamine be determined through biological monitoring, and we caution you and your wife that any drug screening performed on either of you is very likely to result in body burdens that are significantly elevated over a non-exposure control population. Indeed, the body burdens may mimic a therapeutic methamphetamine user.

All models are wrong, and some are useful. This model like most models is qualitative, but it is nevertheless tenable for a qualitative human exposure model. At increased cost, we could refine the parameters of the model, and make it more tenable. However, for the objectives of this discussion, the conclusions based on the model are sufficiently tenable. If you need more information, or would like details about the model, please let me know.

Kind regards,

Caoimhín P. Connell
Forensic Industrial Hygienist

[4] Oral, inhalation and dermal-transfer leading to ingestion.