Emailed 02-26-2015 to me by Dr. John Stansbury

Excerpts he had taken from his study:

a. TransCanada's Risk Assessment calculated that the average (mixed) benzene concentration in surface water for a 10,000 Bbl spill in a 10,000 ft3/sec stream would be 2.2 mg/L (ENTRIX, 2010); however, this calculated concentration assumes that all of the benzene would be released into the water within one hour (likely over-estimates resulting concentrations) and that the benzene is immediately mixed across the entire stream (under-estimates resulting concentrations). Note that 2.2 mg/L is 440 times the MCL for benzene. Beyond admitting that the concentration will be unacceptable, and therefore, pose a human health risk, there is no further analysis. There should have been a human health risk assessment that would have estimated the increased risk of cancer, but there isn't any such assessment. They simply state that the concentration will be unacceptable and leave it at that.

b. Stansbury (not TransCanada) estimates benzo(a)pyrene (BaP) concentration at the oil/water interface of a major spill into a stream would be 1.8 µg/L. The EPA Region III water quality criteria for benz(a)pyrene to protect aquatic species is 0.015 µg/L (EPA, 2011b). In addition, there are several other PAHs with water quality values to protect aquatic species (e.g., benzo(a)anthracene (0.018 µg/L), fluoranthene (0.04 µg/L), and naphthalene (1.1 µg/L)) that are likely to have concentrations that exceed water quality criteria in a major spill. Therefore, the estimated concentration of PAHs is approximately 100 times the allowable level for protection of aquatic life. Note that the reason Stansbury's estimate is used here is that TransCanada failed to assess even the potential concentrations of PAHs let alone assess the potential health and environmental risks posed by the release of these chemicals.

c. According to a TransCanada publication "Frequency-Volume Study of Keystone Pipeline" (DNV, 2006), a leak of 1.5 percent of total flow could remain undetected for 90 days. For this analysis, the discovery and shut-down time is assumed to be 14 days which corresponds to the time between pipeline inspections. At the design flow rate of 900,000 Bbl/d, a 1.5 percent leak would release 189,000 Bbl (7.9 million gallons) of DilBit in 14 days. Since DilBit is 0.1 to 1.0 percent benzene, this would result in a release of up to 79,380 gallons of benzene into the groundwater. If the leak does go undetected for 90 days as the TransCanada document reports, a groundwater user could be exposed to unacceptable concentrations of benzene for a significant period of time. There should have been a human health risk assessment that would have estimated the increased risk of cancer, but there isn't any such assessment. They simply indicate that there could be a significant, undetected release of benzene which could be consumed by human receptors and leave it at that. Note, be careful using my "estimate" of a groundwater plume dimensions. As it states in my report, this is not a prediction of a plume size, it is only

the dimensions that a plume could have for the predicted amount of released benzene – the actual plume size would depend on a lot of site-specific conditions.