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Reply to: stifelman.marc@epa.gov

**MEMORANDUM**

Subject: Comments on: Yakama Nation Exposure Scenario for Hanford Risk Assessment  
Dated: September 7, 2007 *H-O-6*

From: Marc Stifelman, Office of Environmental Assessment

To: Larry Gadbois, EPA Hanford Operations Office

Cc: Mike Cox, Office of Environmental Assessment  
Marcia Bailey, Office of Environmental Assessment  
Rick Poeton, Office of Environmental Assessment  
Damon Delistraty, Washington Department of Ecology

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**EDMC**

Thank you for the opportunity to review the Yakama Nation Exposure Scenario. I'm hopeful the scenario will help to incorporate Yakama activities into future risk assessments. However, I found the qualitative information more valuable than the quantitative information. Consistent with recommendations in the scenario, additional interviews should be conducted to improve the usability of the data. Future refinements should focus on assigning reasonable values to representative activity patterns. The objectives of the scenario may be better served by multiple scenarios to address the potential for specialized exposures, different time frames (e.g., current exposure, future exposure, or treaty rights exposure), or the addition a central tendency measures (Browner, 1995; U.S. Environmental Protection Agency, 2000).

**Quantitative Analysis**

The approach of reducing 16 surveys to the maximum is problematic for several reasons: 1) it results in a loss of data related to the variability and range of consumption patterns of an individual's response 2) it fails to capture the range of responses among different individuals 3) results are not likely reproducible. The net effect of this approach is lost of information and biased exposure estimates. Alternative methods of data exploration and analysis should evaluate the range of both intra- and inter-individual variability of the survey responses and estimate standard risk assessment parameters, including mean, median, upper percentile values, and confidence limits. This should be done after a additional surveys are conducted and compiled with the initial 16.

**Specific Comments**

Estimated breathing rates are biased high from using short-term studies as estimates of lifetime exposures (Stifelman, 2003; Stifelman, 2007).

Sweatlodge use for 7 hours per day, 365 days per year, for 70 years appears implausible.



## References

Browner CM (1995) Policy for Risk Characterization at the U.S. Environmental Protection Agency p 4. Washington DC: U.S. EPA <http://epa.gov/osa/spc/htm/2riskchr.htm>

Stifelman M (2003) Letter to the editor (concerns assumed inhalation rate for Spokane Tribe). *Risk Anal* 23: 859-860

Stifelman M (2007) Using doubly-labeled water measurements of human energy expenditure to estimate inhalation rates. *Science of The Total Environment* 373: 585-590  
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U.S. Environmental Protection Agency (2000) Risk Characterization Handbook p 178. Washington DC: U.S. EPA Science Policy Council  
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