

**From:** Dan Carney [mailto:danc@syaeng.com]  
**Sent:** Friday, September 09, 2011 10:58 AM  
**To:** 'lambesis.christopher@epa.gov'  
**Subject:** Risk Analysis Assumptions for Mercury

Chris,

In follow up to our discussion late last week, I am providing additional information regarding consumption habits of fishers for the lakes in France Park as part of the study area of the human health risk assessment modeling for the Essroc Logansport facility. Having coordinated with you throughout your modeling project, we understand that EPA's model has resulted in a worst-case hazard quotient (HQ) that is slightly above the 0.25 protective default but still less than the generally accepted 1.0 protective level. We understand this result is based on the adult HHRAP fisher from the smaller of the two France Park lakes (i.e., Old Kenith Stone Quarry Lake). Also knowing that several HHRAP default assumptions were used that each linearly affect the results, we believe that the combination of factors can be used to show that the estimated mercury HQ value is expected to be acceptable.

I am providing information on one specific factor that we had not previously spoken about, which is the percentage of contaminated fish that a HHRAP level fisher would consume from the one water body in France Park versus fishing from a variety of water bodies. That said, this brings in question the fraction of fish that is plausible to be part of the high-end fisher's diet. In providing information on this factor, I believe it is pertinent to evaluate the factor also in light of the rest of the HHRAP default (and site-specific) assumptions that are known to affect mercury risk assessment results, as follows:

- The facility has tested for and provided both site-specific particle size distribution and mercury speciation data to EPA Region 5 for use in the model.
- The HHRAP default bioaccumulation factor has been used (for trophic level 3.5 fish) which suggests that the fish harvest is from "game fish"; where a more plausible scenario encompasses a combination including lower trophic level fish.
- The HHRAP higher end of the mercury methylation rate range of 6-15% has been applied.
- The model assumes that the facility operates 100% of the time over 30 years, whereas actual operations are typically in the 85% - 90% range for the cement manufacturing industry due to the necessity for annual maintenance down time.
- The HHRAP default consumption rate for a high-end fisher is being applied, which assumes that a predominant portion of the individual's diet is supplied from fish.
- The HHRAP approach uses a benchmark of 0.25 for the HQ as already a 4-time reduction from the typical HQ threshold of 1.0.
- The emission rate of mercury is based on the maximum MACT emission rate during all times of operation (along with the 100% operating time assumption).

As noted in HHRAP, Section 6.2.4.3, fish consumption rates vary greatly, with total fish consumed and the percentage of locally caught fish consumed being part of what goes into this factor. HHRAP defaults are based on a higher end consumption rate, assuming that an individual eats 100% of their fish from the contaminated source, although this section also notes that the percentage of locally caught fish is also a variable for exposure.

Meanwhile, Essroc previously submitted information to EPA documenting fish consumption habits from France Park lakes. As noted in our May 15, 2009 Revised Mercury Comparative Analysis, from our discussions with park and fisheries personnel it is not expected that fish from France Park lakes are a primary food source due to the park's daily entrance fee and the lakes not being currently stocked. Although we understand that fish stocking and park conditions can change, we believe that the use of the default HHRAP consumption rate in addition to the default value for the fraction of fish that is contaminated ( $F_{\text{fish}}$ ) provides an overestimation of the risk assessment mercury results. In fact, Table C-1-4 of the 2005 HHRAP document notes that using the default  $F_{\text{fish}}$  value of 1.0 assumes the receptors consume *only* contaminated fish.

In addition to the previous information supplied, SYA has contacted another source of fish information in Indiana (Tom Stefanavage; Indiana's State Big Rivers Fisheries Biologist; (812)-789-2724). Mr. Stefanavage has worked in this field for over 30 years, with his past responsibilities including lakes and ponds in addition to rivers. He clearly stated that he is aware of no subsistence fishing in Indiana at this time, although he has heard from the "old-timers" that living off the land was more a way of life back in the 30s and 40s, with a diet based on locally caught fish and game (e.g. opossum). He noted that even with the most technically sophisticated equipment used in his job to study fish that they had limited success in catching a predictable and consistent level of fish. He surmised that given today's economy it is, however, possible that a homeless person living under a bridge might try to rely on fish, but he doesn't think it would be possible to rely on catching fish day to day and that would require money for bait and line in addition to the fisher happening to be lucky enough to be in the right habitat for consistent fish availability. Therefore he called this practice "extremely difficult of not impossible, and that he couldn't imagine anyone doing that". He said that level of acquiring fish could be more possible with commercial fishing such as on the Ohio River, but would require big boats and equipment.

Mr. Stefanavage further talked about fish in lakes and ponds. His conversation included the amount of acreage necessary to feed a person in addition to needing to do specified methods of aquaculture to optimize the level of fish. He noted that lake species are short lived and a non-fatty species in which the contaminant levels do not accumulate versus the 30-year life-span of big fatty species that do tend to accumulate contamination, and that there is a lot of demand today on recreational fish versus 100 years ago when population levels of fish (in rivers) were higher. Finally, Mr. Stefanavage's career included living in Africa in a subsistence fishing environment and he noted that was an entirely different situation than he has witnessed in his lifetime and as a career fisheries biologist. In response to questions to Mr. Stefanavage about the

plausibility of a 30-40% (versus 100%) consumption rate from a specific water body such as the lakes at France Park, he did not think that was unreasonable (although still not realistic) especially given the HHRAP default consumption rate assumptions.

In addition to the information provided, and as a reminder, the management of France Park lakes does not necessarily support year-round fishing which further brings in question the 100%  $F_{fish}$  assumption. The Old Kenith Stone Quarry Lake, the primary lake being evaluated in the analysis, is **not** open to fishing during the summer months when it is used as a recreational sunbathing and swimming lake. According to park personnel, the lake use is restricted to sunbathing and swimming from Memorial Day through Labor Day (approximate dates, actual dates are dependent upon weather and lifeguard availability). In addition, fishing is limited to ice fishing in winter months, which does not typically produce the same level of catch due to the substantially decreased activity of the fish. The website note on ice fishing states, "Those "polar bears" that are willing to wait for the fish to come to their pole in the cold, may use either of the lakes at France Park as the ice becomes thick enough. Check with the park ranger about ice thickness before going out on the ice." Again, between the fishing restriction in the summer and the limitation on cold-weather fishing, we believe that the assumption of 100% contaminated fish is overly conservative and deserves reconsideration.

Since EPA has used HHRAP conservative assumptions for key parameters in the mercury modeling, along with site-specific data from on-site testing, Essroc believes there is ample conservatism built in and therefore the percentage of contaminated fish in the receptor's diet should be a consideration. Further, based on a more plausible percentage of contaminated fish set at 30 to 40%, we believe that the estimated HQ for mercury for the Essroc Logansport facility would be expected to be at or below a value of 0.25.

We look forward to your review and concurrence.

Sincerely,

Dan Carney, P.E.

Senior Engineer

Schreiber, Yonley & Associates

office: 815-288-6261

cell: 815-353-0606

Carrie Yonley, P.E.  
Schreiber, Yonley & Associates  
(573) 657-0378  
(636) 773-0430 (fax)  
[www.perma-fix.com/sya](http://www.perma-fix.com/sya)