



*B.E.A.T. Working with you to protect the environment of Berkshire County*

**Comments on the Model Validation Report to the Peer Review Panel  
June 28, 2006**

First, let me say that I am not a modeling expert nor a statistician and that it has been awhile since I have taken a graduate level statistics course. While some of our review committee may have had more recent exposure, none of us are modeling specialists. We are looking to you for a clear indication of where this model's strengths and weaknesses lie as a tool to predict the future fate of PCBs in the entire river below the confluence in Pittsfield.

With that said -

**Questions for the Model Validation Report – and I am paraphrasing on some of these -**

1. Does the model reasonably account for the fate, transport, and bioaccumulation of PCBs in order to predict future concentrations in sediment, fish, and water, to a level of accuracy that would allow us to assess relative performance among remedial alternatives and against baseline conditions; and is this model the best estimate available to help evaluate the performance of remedial alternatives.

BEAT believes that the attempt to validate the model, showed that the model does not accurately predict the fate and transport of PCBs.

As for bioaccumulation, although, in BEAT's opinion, there was too little data to be statistically valid, the attempted validation of the model appears to under represent the amount of PCBs in most groups of fish.

BEAT believes the model should only be used to compare scenarios, not to predict future levels of PCBs under any one scenario. For one thing, the existing spatial variability in distribution of PCBs is pretty much ignored and averaging is used. BEAT believes this averaging is almost always inappropriate, but in the modeling it adds an additional layer of inaccuracy. This should cancel out if the model is used to compare two remediation scenarios, but it will not accurately predict the fate and transport of PCBs in a given real-world situation.

**BEAT ☪ 27 Highland Ave, Pittsfield, MA 01201 ☪ 413-230-7321 ☪ [jane@thebeatnews.org](mailto:jane@thebeatnews.org)**

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We are especially concerned by the lack of validation in the Woods Pond area and the lack of data on the amount or predicted amount of PCBs flowing over the Woods Pond dam. We do not believe that the model accurately predicted the amount of PCBs in the top six inches of sediment above Woods Pond dam. We do not think the model accurately reflects the amount of sediment disturbance that takes place in this area as indicated by the lack of correspondence in the Cesium data. If we are correct, this degree of disturbance also points to the folly of assuming the top six inches of sediment is all that matters. We are not talking about the routine mixing by invertebrates, but the larger disturbance by thrashing carp, or a beaver dragging a waterlogged branch, or a moose wandering through.

BEAT is also concerned that the model can not predict what would happen in a very large and windy storm? Or if a tornado produced a waterspout over the water of Wood Pond? And what would happen if the dam were breached or removed – especially if this happened unexpectedly?

We do not feel that the model has been shown to accurately predict the amount of PCBs flowing over Woods Pond dam. The Woods Pond dam is a location that BEAT believes measurements would need to be taken to act as inputs to the model below this point. We do not think that the model should be used to predict the input to the modeling for below the Woods Pond dam.

BEAT does not believe there was nearly enough data to statistically validate the model's predictions of bioaccumulation in various fish species. With that data that was collected, we believe it under predicts the amount of PCBs that accumulate in most species of fish. This possible error would be magnified for piscivorous predators. For us this is a major flaw. We would like to see EPA decide not to use a model to predict the levels of PCBs that will be bioaccumulated. The exposure pathways for all animals, not just humans, should be reduced to near zero. This is the only way to stop spreading PCBs around the world.

We do not want to see the continued clean up of the river held up by the lack of ability to predict PCB bioaccumulation.

#### Charge Question

2. Are the comparisons of the model predictions with data sufficient to evaluate the capability of the model on the spatial and temporal scales of the final calibration and validation?

BEAT does not believe the model predictions are sufficient in that they do not take into account the amount or depth of PCBs in the deeper sediments in Woods Pond, nor the major disturbances that may occur there. Unless the model could more accurately reflect the depth of sediments at Woods Pond, decisions for this area should be made based on many other factors along with model predictions, but certainly should not rely on the model in this location.

As stated above, actual measurements of PCBs in the water column below the Woods Pond dam should be used as inputs for the model below the dam.

There is insufficient data to validate the model for bioaccumulation.

BEAT ☪ 27 Highland Ave, Pittsfield, MA 01201 ☪ 413-230-7321 ☪ [jane@thebeatnews.org](mailto:jane@thebeatnews.org)

### Charge Question

3. Is there evidence of bias in the models, as indicated by the distribution of residuals of model/data comparisons.

As stated above, BEAT believes that there is not enough bioaccumulation data to be statistically valid, but the data that has been presented appears to under predict the amount of PCBs in fish.

I will skip charge question numbers 4 & 5.

### Charge Question

6. Upon review of the model projections of changes in PCB concentrations in environmental media in the example scenarios, are such projections reasonable and plausible given the patterns observed in the data?

In considering this question, please pay especially attention to the Woods Pond area. We do not believe that projections are reasonable in a real world situation. BEAT does not think the validation data fits the model well in this location, and we do not think the projections for the example scenario are reasonable nor plausible except under ideal conditions.

### Charge question

7. Is the final model framework, as calibrated and validated, adequate to achieve the goal of the modeling study to simulate future conditions 1) in the absence of remediation and 2) for use in evaluating the effectiveness of remedial alternatives?

BEAT believes the model can be a useful tool, but we do not think the model has been validated nor should it be applied to predicting the fate and transport of PCBs ~~in and around Woods Pond~~. BEAT believes the model has not been validated in its ability to model bioaccumulation in fish, and further that the sparse data used to attempt to validate this shows a bias toward underreporting the amount of PCBs accumulated. We believe the model is a useful tool to compare strategies and only in respect to PCB fate and transport -- not bioaccumulation. Only in comparing two or more scenarios will errors cancel out. For bioaccumulation, all access pathways for animals to be exposed to PCBs should be reduced to as close to zero as possible -- no model needed.

*in the absence of remediation.*

As a final comment, I was shocked by two sentences in the Validation Report. The first said that from New Lenox Rd to Woods Pond has a 50% trapping efficiency of PCBs (from before a few pages before page 9-32 Model Validation Report dated 3/6/2006 )

The second said that 90% of the mass of PCBs in the Housatonic River system is between the confluence of the East and West branches and Woods Pond (page 9-32 line 20 of the Model Validation Report dated 3/6/2006 )

IF both of those were true that would mean about 45% of the original PCBs that made it down to the confluence, have escaped into the air or ocean! What a sad state of affairs that is!

Thank you for taking BEAT's comments into consideration.

Sincerely,

Jane Winn  
Executive Director