Additional Comments

May 1, 2005

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These comments are in addition to my previous comments and are specifically related to my somewhat lengthy comments in response to Question 3.

EPA states that the mixing layer is 6 inches (15 cm) thick and the mass transfer coefficient is 1.5 cm/day. If erosion/deposition is ignored and the contaminants have a Kp = 10^5 (a little conservative for the Housatonic), this indicates a natural recovery time of approximately 2000 years (see previous comments for the calculation). On this basis, natural recovery is not an option; it takes too long. This applies throughout the river – bank to bank and from the confluence to Woods Pond Dam. The entire river needs to be dredged and/or capped. No modeling is necessary for this conclusion.

What happens when erosion/deposition is considered? Since the n's in EPA's erosion formulas are relatively small, I doubt that erosion/deposition will modify these results, even in big events, i.e., erosion will not penetrate down to the clean base sediments and there will not be enough erosion and hence subsequent deposition to cover the contaminated sediments by more than six inches of clean sediments in a reasonable amount of time. These estimates should be checked by simple transport calculations (a big event and estimates of long-term deposition), but they are consistent with existing model results and my belief is that, to a first approximation, they are correct – based on EPA parameters.

If dredging is done, sediments must be dredged down to clean base sediments, bank to bank, and along the entire river from the confluence to Woods Pond Dam. This follows from the model and EPA parameters.

If capping is done, the cap must be at least twice the mixing layer thickness plus whatever consideration of erosion requires.

These conclusions follow from the EPA parameters and simple estimates – no lengthy calculations are needed. However, I don't really believe these conclusions. They may be correct, but the proof isn't there. The reasons that these conclusions may not be correct are (1) the assumed value of 6 inches for the thickness of the mixing layer is much too large and has no justification and (2) the assumed values of n lead to low erosion during big events and are inconsistent with experimental results. Both of these assumptions are inadequate. The use of only one grid cell across the river just exacerbates the problem.