NITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION II
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June 1, 2015

BY ELECTRONIC MAIL

Robert Law, Ph.D.
demaximis, inc.
186 Center Street, Suite 290
Clinton, New Jersey 08809

Re: Lower Passaic River Study Area, 17-Mile RI/FS
Benthic Community Exposure Depth

Dear Dr. Law:

On February 6, 2015, EPA met with the Cooperating Parties Group (CPG) to discuss their proposal to use 2 centimeters (cm) as the benthic community exposure depth in the Lower Passaic River Study Area (LPRSA). It is EPA's understanding that the CPG wants to use contaminant concentration simulation results averaged over this depth interval in the bioaccumulation model being developed by the CPG to predict future contaminant concentrations in biota post-remediation.

The CPG's proposal is based on their conclusion that the feeding zone for biota in the LPRSA is primarily limited to only the top 2 cm of contaminated sediment. To support this position, the CPG relied primarily on a Sediment Profile Imaging (SPI) Survey prepared by Germano & Associates, Inc. in 2005, particularly the redox potential discontinuity results from this survey (which show the depth of the aerobic layer), as well as benthic community data from the remedial investigation (RI) and relevant physical characteristics of the river such as organic carbon levels and dissolved oxygen concentrations.

EPA has reviewed the material presented by the CPG as well as additional material germane to their proposal. Although varying depths of benthic community exposure less than 15 cm may be appropriate for parts of the LPRSA, we do not support the use of a zone as shallow as 2 cm. Further, modeling contaminant concentrations in a zone with minimal empirical data will not yield accurate predictions. It is EPA's position that the existing RI data from the top 6 inches (approximately 15 cm) of sediment, and model concentration simulation results for this depth interval, should be used to represent contaminant concentrations for this parameter. That said, EPA is willing to discuss with the CPG their collection of new SPI data to more accurately determine the benthic community exposure depth for the LPRSA followed by the conduct of additional sediment sampling from appropriate depths, as identified during the new SPI survey.

EPA has come to this conclusion for several reasons:

a. Surface sediment sampling of the LPRSA has been performed in a number of phases over many years, with an agreed upon data use objective that a composited sample from the

top 15 cm is representative of surface sediment concentrations across the entire sample depth. The top 2 cm of sediment is a very thin layer that is subject to constant change due to erosion, deposition and other factors. By contrast, a 15 cm composite, which is still a relatively thin surface layer, accounts for this variability and is a reasonable representation of the surface concentration at any point in time.

b. A review of the limited dataset of finely segmented cores with contaminant concentrations from depths of less than 15 cm shows significant variability: sometimes the surface concentrations are higher than concentrations averaged over the top 15 cm and sometimes they are lower. If these data suggest anything, it is that a 15 cm composite reasonably represents concentrations at shallower depths.

c. The existing dataset of finely segmented cores does not provide a reliable basis from which to model future concentrations in sediment. The contaminant fate and transport model has been calibrated using 15 cm data, and while there is uncertainty associated with any future projections, predicting concentrations over a significantly shallower and thinner horizon than the model is calibrated to would add unquantifiable uncertainty to the future projections.

d. The resolution of the existing bathymetry change dataset is significantly greater than 2 cm, due to factors including instrument accuracy and changes in surface sediment density (i.e., reflectiveness). The sediment transport model has been calibrated using the bathymetry change dataset, the accuracy of which is a direct function of the uncertainties of the individual bathymetry datasets, which means that the model cannot reliably predict bed elevation changes at scales as small as 2 cm. Since the contaminant fate and transport model's predictions of contaminant concentrations are driven by bed characteristics passed to it by the sediment transport model, this inability to reliably predict bed elevation changes at 2 cm scales would further add to the uncertainty in the predicted contaminant concentrations in the 2 cm layer.

For the reasons described above, EPA has concluded that use of the average model results from the 15 cm horizon, consistent with the RI data, is most appropriate to represent contaminant concentrations in the benthic community exposure zone for use in the bioaccumulation model for the 17 Mile RI/FS.

Please let me know if you have any questions.

Sincerely,

Stephanie Vaughn, Project Manager
LPRSA 17-Mile RI/FS

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