

**Environmental Engineering Seminar
Monday, February 15, 2016
Dillman 214 at 3:00 pm**

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***“Hydrodynamic and Sediment Transport Models to support
USEPA’s response to the 2010 Kalamazoo River Oil Spill”***

This presentation describes the development of LimnoTech’s updates to models (riverine and floodplain) developed by Enbridge to simulate Kalamazoo River hydrodynamics and sediment transport. The models were updated with new information in support of the following:

- To characterize probable areas of sediment deposition and/or erosion which based on 2010 and 2011 field work relates to submerged oil occurrence. Areas of deposition/erosion were characterized for a range of flow conditions.
- To assess down river transport of sediment and potentially submerged oil for a range of flow conditions.
- To assess sedimentation rates for selected locations as a function of flow and sediment particle size.

The Environmental Fluid Dynamics Code (EFDC), was used to model the hydrodynamics of the river and the Sandia National Labs version of EFDC (SNL-EFDC) incorporating the SEDZLJ sediment transport algorithms was used to simulate sediment and oil transport following Enbridge’s Line 6B crude oil release on July 26, 2010. The domain for one model represents only the river channel (riverine model). The domain for the other model represents both the river channel and the floodplain (floodplain model). Both models were developed in 2-dimensions (2-D). Updated model inputs were developed based on revised bathymetry information, tributary flows, sediment rating curves, dam rating curves, improved representation of the sediment bed characteristics, and the addition of an oiled particle algorithm. The models were calibrated to discharge, water surface elevation, and velocity using data from United States Geological Survey (USGS) Gaging Stations located on the Kalamazoo River, along with field data obtained in 2011 and 2013.

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