Advancing Derailment Oil Spill Loss and Mass Estimates

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On February 16, 2015, CSX Transportation (CSXT) Train K08014 (a loaded crude oil unit train) derailed and caught figure in Mt. Carbon, West Virginia. A total of 28 tank cars derailed and 19 were breached and involved in fires. The location of the derailment was on an elevated track bed, above a residential property, adjacent to Armstrong Creek and the Kanawha River. The nature and size of the event, the topography at the derailment location, the proximity to surface water, and the fires which occurred as a result of the derailment created a challenge for not only the response activities but for the development of product loss estimates and subsequent environmental mass balances.

Initial categorization of losses was performed to distinguish between atmospheric burn losses and ground losses. Atmospheric losses were further categorized using robust tank car damage assessments. Ground losses were further categorized using damage assessments, pool fire estimates, soil mass estimates, surface and subsurface product recovery measurements, and laser induce fluorescence surveys. The combined qualitative and quantitative loss and mass balance analysis performed at the Mt. Carbon incident informed environmental assessment, cleanup strategy and implementation, and regulatory decisionmaking. Documented observations during the initial (pre-cleanup) phases of the derailment were critical in developing accurate loss and mass estimates and built upon the foundation and lessons learned from previous incidents.