

Carl E. Hensman, Ph.D. – For the panel “Characterizing the Release of Mercury from CUB”

“How do we develop methods to determine the mobility of metals in CUBs?”

When presented with the challenge of developing methods to determine the mobility of a range of target metals through different pathways for different coal utilization byproducts, a review of the literature presents multiple techniques all with different decision goals. Ultimately, the decision goals distill into two general areas: 1) what is the impact of environmental conditions on a CUB material? 2) How does the mobility of metals in CUB material A compare to CUB material B?

In the case of 1) the method should be defined by a set of environmental conditions specific to the location of CUB use. For example, the mixed bacterial community at one disposal site may not be the same as the mixed bacterial community at a second disposal site. Therefore, a mercury methylation assessment method developed for CUB disposal at the first disposal site may not be appropriate at the second disposal site. Obviously, in an ideal situation, both sites would be tested with the appropriate mixed cultures, but what is the potential cost of this option?

In the case of 2) the method should be a standard operating procedure, which anybody who wishes to compare the mobility of a target metal in their CUB to pre-existing data can execute with no specialist equipment or knowledge. This would then allow a speculative response of the metal mobility, based on previous application experience of the comparison materials. However, how can this standardized data be directly related to environmental impact? It essentially just predicts which CUB material may be less mobile under the SOP conditions. For example, a SOP leaching study of two CUBs ‘A’ and ‘B’ results in CUB ‘B’ leaching less arsenic. If, at the disposal site, the leachate conditions are very different to the SOP, arsenic could well be leached above the regulated level.

This panelist hopes to open up the debate of which is more relevant for future CUBs use planning; the impact of specific environmental conditions on a CUB or intra-material comparison of all materials?