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# Clean Coal

Is "clean coal" an oxymoron or actually possible? Researchers at ISTC hope to make clean coal a reality.

Illinois coal mines produced 52.1 million tons of coal in 2013 and employ approximately 16,000 people (both directly and indirectly). After the coal is mined, it is taken to a coal processing plant where it is crushed, washed, and separated from unusable materials. The wastewater from the washing and separating step typical contains from 10-50% of the original coal ore with ultrafine waste materials at about 10% of the mined coal. The coal wastewater typically ends up in lined slurry ponds, rendering any ultrafine waste materials unusable.

Several options for dewatering fine coal and refuse are available to coal preparation plants (Nicol et al., 1997) to recover the coal material for reuse. However, cost-effective dewatering continues to be a technical and economic barrier to the stabilization of coal tailings (Xian-shu et al., 2009). Conventional techniques utilizing thermal or mechanical methods have been ineffective in dewatering tailings in an environmentally compatible and/or cost-effective manner (Mohanty, 2007). This has resulted in continued interest in development of coal tailings dewatering methods and techniques. While substantial progress continues to be made in conventional dewatering technologies, a non-conventional approach to dewatering utilizing an osmotic gradient (an expansion of the Aquapod technology) was investigated by Dr. Kishore Rajagopalan and his team as a simple, robust, and low-cost alternative.



By dewatering the fine coal and refuse, these ultrafine waste materials become a value-added product and can be used in construction backfill at coal mines. Water from the dewatering process could be recycled back into the washing process but further research would be needed to verify that possibility.

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