Potential environmental problems with oil shale

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Oil shale is regaining some interest for use as a source of oil. Being a mineral source, oil shale has all the potential problems of other fossil fuels in that certain sites may have significant environmental contaminants such as sulfur, mercury, arsenic, and selenium. Above ground oil shale processing by retorting is an operation that can create an enormous amount of waste material, as the oil portion of the mineral may only be 20% of the mass of the mineral. The remaining 80% constitutes a waste management issue even if the by-products were completely inert. If the by products are hazardous, the problems are compounded. During hot mineral processing elemental mercury is emitted. Unlike mercury produced by coal-fired power plants, no oxidation of the mercury would occur to assist its capture.

Preliminary testing of several oil shale deposits shows some disturbing trends. Samples from a Green River deposit have 0.23 mg/kg of mercury. This value is 3 times the level for Wyodak coal when measured by weight, but 11 times the Wyodak level when compared on a BTU basis. Experiments conducted by heating of ground oil shale show that 50% of the mercury is emitted to the environment by 100°C, and 80% by 200°C. With processing activities as mild as drying at 100°C, precautions will need to be taken to avoid mercury emissions.

Work supported by USDOE under DE-FC26-98FT40322