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## A first order evaluation of atmospheric emissions from a hypothetical *in-situ* oil shale retort

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Federal Clean Air Act Class 1 areas located close to oil shale deposits have strict air quality standards and are sensitive to airborne releases requiring quantification of the mass emission rates from oil shale operations. An area that has received little attention is diffuse gas phase flow of pollutants from *in-situ* retort processes, especially for lower temperature and longer duration *in-situ* processes. We present preliminary results of a first-order investigation evaluating gas phase flow of air pollutants originating from a hypothetical *in-situ* retort zone that migrates through the subsurface and enters the atmosphere as a non-point diffuse source at land surface. We provide order of magnitude estimates for the total volume and concentration of gaseous species generated in the retort zone based upon gas production from laboratory scale low temperature retort experiments. These experimental data are extrapolated to the field scale to create a subsurface gaseous source term for a “typical” oil shale development. Defining the volumes of gaseous species generated in the retort zone that are not captured by a recovery system is problematic with the available data and we use a simple percentage loss approach to create the gaseous source term. A simplified vadose zone transport model is used for a parametric sensitivity study to identify areas of greatest uncertainty and focus future testing. Finally, we evaluate the effect of such a release using an air transport code to model the hypothetical gaseous contaminant trajectory and dispersion from a “typical” oil shale *in-situ* retort.