

Field Measurement of Black Carbon Emissions from Flares

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The ability to accurately predict particulate matter emissions from flares has been limited by the lack of viable approaches for measuring these emissions under field conditions (1). While experiments under controlled conditions are the key to developing emission factor models, it is equally critical to be able to validate and improve models through full-scale measurements under field conditions. In recent work supported by Natural Resources Canada, CAPP/AUPRF, Environment Canada, and the World Bank, we have successfully demonstrated a novel technology for conducting field measurements of black carbon emissions from soot producing flares (2, 3). This new technique is known as "sky-LOSA", where LOSA is an acronym for line-of-sight optical attenuation. Continued efforts in collaboration with the World Bank have led to the opportunity to conduct more extensive field measurements on full-scale flares in Mexico, and negotiations are underway for further measurements at a full-scale, outdoor flare test facility in Oklahoma. With co-funding from Environment Canada and Natural Resources Canada, through this proposal we intend to measure and analyze black carbon emission factor data for flares using the novel sky-LOSA technique. The field measurements will be performed on un-modified operating flares, while accurate flare gas flow and composition measurements will be concurrently recorded. The derived data will form the first ever full-scale black carbon particulate matter emission factor data obtained for flares under field conditions.

This project will present a unique opportunity to leverage significant investment by other organizations to make field emissions measurements that might not otherwise be possible.

Given the known problems with current particulate matter emission factors used in NPRI reporting, the results of this project will enable improved environmental performance via more accurate reporting of emissions to the benefit of all stakeholders.

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