

## Assessment of Air Quality Around Western Refinery in Libya: Mobile Monitoring

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**Abstract :** This coastal crude oil refinery is situated north of a big city west of Tripoli; the city then could be highly prone to downwind refinery emissions where the NNE wind direction is prevailing through most seasons of the year. Furthermore, due to the absence of an air quality monitoring network and scarce emission data available for the neighboring community, nearby residents have serious worries about the impacts of the oil refining operations on local air quality. In responding to these concerns, a short term survey has performed for three consecutive days where a semi-continues mobile monitoring approach has developed effectively in this study; the monitoring station (Compact AQM 65 AeroQual) was mounted on a vehicle to move quickly between locations, measurements of 10 minutes averaging of 60 seconds then been taken at each fixed sampling point. The downwind ambient concentration of CO, H<sub>2</sub>S, NO<sub>x</sub>, NO<sub>2</sub>, SO<sub>2</sub>, PM<sub>1</sub>, PM<sub>2.5</sub> PM<sub>10</sub>, and TSP were measured at carefully chosen sampling locations, ranging from 200m nearby the fence-line passing through the city center up to 4.7 km east to attain best spatial coverage. Results showed worrying levels of PM<sub>2.5</sub> PM<sub>10</sub>, and TSP at one sampling location in the city center, southeast of the refinery site, with an average mean of 16.395µg/m<sup>3</sup>, 33.021µg/m<sup>3</sup>, and 42.426µg/m<sup>3</sup> respectively, which could be attributed to road traffic. No significant concentrations have been detected for other pollutants of interest over the study area, as levels observed for CO, SO<sub>2</sub>, H<sub>2</sub>S, NO<sub>x</sub>, and NO<sub>2</sub> haven't respectively exceeded 1.707 ppm, 0.021ppm, 0.134 ppm, 0.4582 ppm, and 0.0018 ppm, which was at the same sampling locations as well. Although it wasn't possible to compare the results with the Libyan air quality standards due to the difference in the averaging time period, the technique was adequate for the baseline air quality screening procedure. Overall, findings primarily suggest modeling of dispersion of the refinery emissions to assess the likely impact and spatial-temporal distribution of air pollutants.

**Keywords :** air quality, mobil monitoring, oil refinery

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