Three Clarity Node sensors (IDs: N5L7, 5KGG and Y3GK) were tested in the field and two sensors were tested in the laboratory (IDs: N5L7 and 5KGG. Unit Y3GK was not able to report data during lab evaluation)

- Overall, the two Clarity Node sensors showed low to high accuracy, compared to FEM GRIMM for a concentration range between 0 to 450 µg/m³. Accuracy increased as concentration increased.
- The Clarity Node sensors exhibited high precision for all T/RH combinations and all PM$_{2.5}$ concentrations.
- The Clarity Node sensors showed low intra-model variability.
- The Clarity Node sensors had good data recovery (>97%).
- For PM$_{2.5}$ mass conc., the Clarity Node sensors showed strong correlations with the FEM BAM from the field ($R^2 \sim 0.73-0.76$) and very strong correlations from the laboratory studies ($R^2 > 0.99$ with the FEM GRIMM).

Deployment period 02/15/2018 - 04/25/2018: the three Clarity Node sensors showed strong correlations with the PM$_{2.5}$ mass concentration monitored by FEM BAM.

- The units showed > 97% data recovery and very low intra-model variability.

Field Evaluation Highlights:

Coefficient of determination ($R^2$) quantifies how the three sensors followed the PM$_{2.5}$ concentration change by reference instruments.

An $R^2$ approaching the value of 1 reflects a near perfect agreement, whereas a value of 0 indicates a complete lack of correlation.
Accuracy was evaluated by a concentration ramping experiment at 20 °C and 40%. The sensor’s readings at each ramping steady state are compared to the reference instrument.

A negative % means sensors’ overestimation by more than two fold. The higher the positive value (close to 100%), the higher the sensor’s accuracy.

<table>
<thead>
<tr>
<th>Steady State #</th>
<th>Sensor mean (μg/m³)</th>
<th>FEM GRIMM (μg/m³)</th>
<th>Accuracy (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>31.2</td>
<td>17.3</td>
<td>19.2</td>
</tr>
<tr>
<td>2</td>
<td>52.4</td>
<td>43.5</td>
<td>79.5</td>
</tr>
<tr>
<td>3</td>
<td>103.0</td>
<td>88.0</td>
<td>82.9</td>
</tr>
<tr>
<td>4</td>
<td>161.2</td>
<td>139.3</td>
<td>84.3</td>
</tr>
<tr>
<td>5</td>
<td>313.7</td>
<td>279.2</td>
<td>87.7</td>
</tr>
<tr>
<td>6</td>
<td>494.7</td>
<td>452.6</td>
<td>90.7</td>
</tr>
</tbody>
</table>

Sensor’s ability to generate precise measurements of PM$_{2.5}$ concentration at low, medium, and high pollutant levels were evaluated under 9 combinations of T and RH, including extreme weather conditions like cold and dry (5 °C and 15%) cold and humid (5 °C and 65%), hot and humid (35 °C and 65%), or hot and dry (35 °C and 15%).

**Coefficient of Determination**

The two Clarity Node sensors showed very strong correlations with the corresponding FEM PM$_{2.5}$ data ($R^2 > 0.99$) at 20 °C and 40% RH.

**Climate Susceptibility**

From the laboratory studies, temperature and relative humidity had minimal effect on the Clarity Node performance.

**Observed Interferents**

N/A