

# Air Quality Work Proposal for Lynsted with Kingsdown Parish Council

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## 1. Executive Summary

Air pollution is an ongoing problem in both Teynham and in Lynsted, yet existing monitoring of NO<sub>2</sub> may not represent the worst-case scenario. Monitoring is absent entirely for particulates and at continuous timescales. We propose a one year regime of monitoring of annual NO<sub>2</sub> using diffusion tubes in locations not covered by the local authority, coupled with continuous monitoring for one year of NO<sub>2</sub> at locations in Teynham Parish as well as in Lynsted with Kingsdown Parish where public exposure is high. Fieldwork would commence immediately the legal limits on social contact imposed by Covid lockdown have been removed, although preparatory work would start immediately. Results of monitoring will be analysed by The University of Kent and compiled into a report.

Total cost of these activities: **£5707.20**

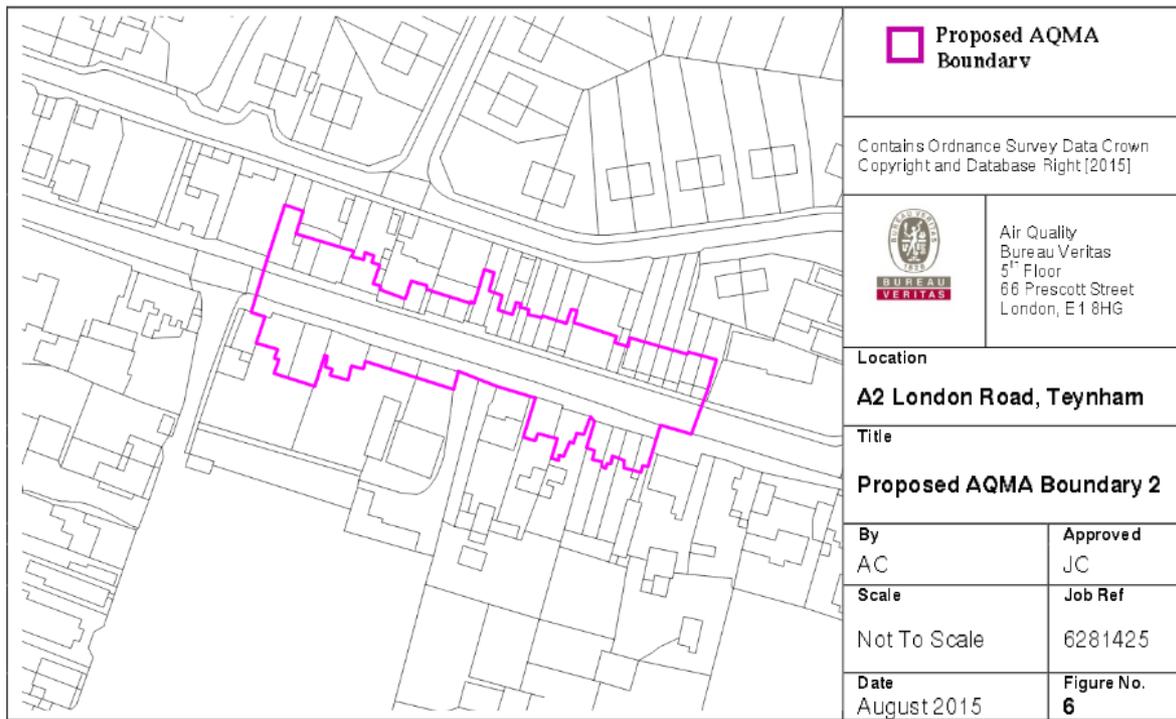
## 2. Problem outline

The health impact of air pollution is an issue in Swale Borough according to Swale Borough Council’s (SBC) 2019 Annual Status Report [1] (section 2.3, page 15):

*“the fraction of total mortality which is attributable to particulate air pollution in Swale Borough increased from 5.6% in 2016, to 5.7% in 2017. This is above the average for both the South East region (5.6%) and England as a whole (5.1%). “*

The 2019 ASR is the last ASR published by Swale Borough Council before the COVID-19 pandemic struck and hence can be considered representative of “normal” conditions.

Specifically in Teynham and Lynsted, NO<sub>2</sub> diffusion tube measurements have historically revealed locations that exceed the national limit for NO<sub>2</sub> of 40 µg/m<sup>3</sup>. As a result of this an Air Quality Management Area (AQMA) was enacted by SBC in 2015. This is shown in Figure 1.



**Figure 1** – AQMA5 in the Parishes of Teynham and Lynsted with Kingsdown as defined by SBC and enacted in 2015 (still in force).

This AQMA is quite narrow in scope and it reflects the spatial concentration of SBC’s existing monitoring regime.

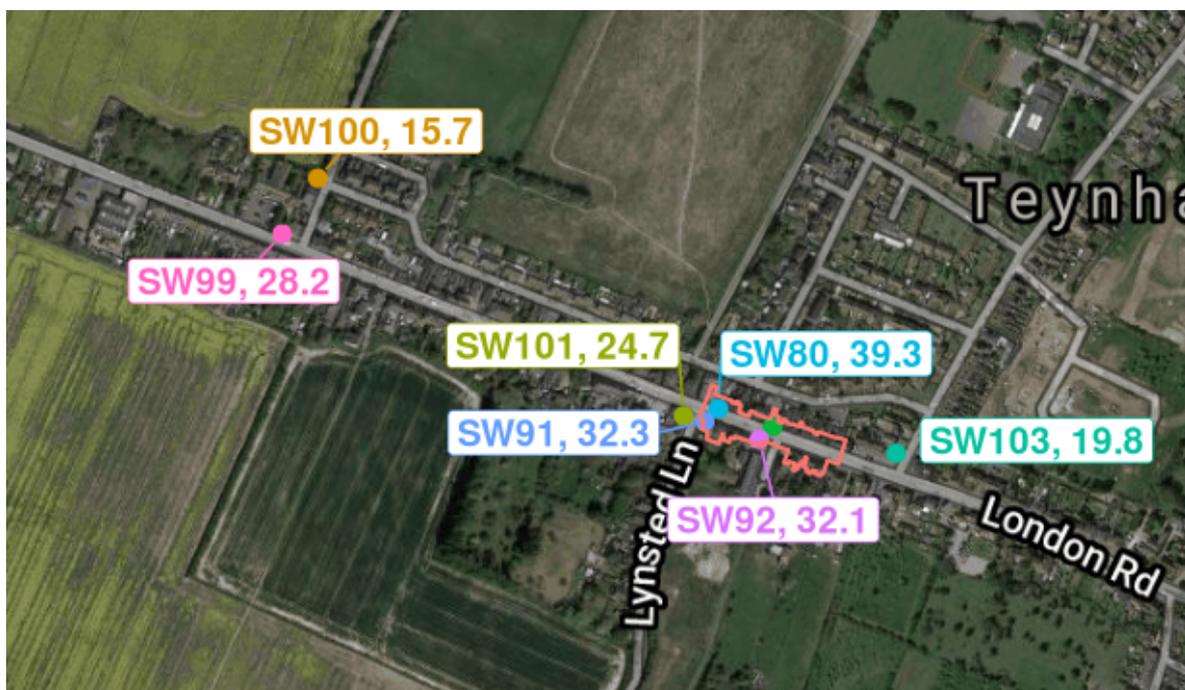
The purpose of this proposal is twofold:

1. To understand whether the existing AQMA fairly represents the pollution levels in the area along and around the A2 on the border of the parishes of Teynham and Lynsted with Kingsdown, and whether or not it should be adjusted.
2. To measure particulates since this pollutant is not currently measured, and understand the potential impact on human health.

### 3. Existing monitoring by Swale Borough Council

Swale Borough Council currently monitors NO<sub>2</sub> via the method of diffusion tubes along the A2 corridor that bisects Teynham and Lynsted, and some streets perpendicular to the A2. SBC does not currently monitor any other pollutants and the nearest continuous measurements are in Ospringe.

Using the data from SBC's 2019 Annual Status Report [1], Figure 2 shows the bias corrected and distance adjusted annual averages of the NO<sub>2</sub> sites in Teynham, the AQMA is approximated using a rectangle for reference.



**Figure 2** - Bias corrected and distance adjusted NO<sub>2</sub> annual means as measured by Swale Borough Council in 2018 (2019 ASR) for Teynham. The Teynham/Lynsted AQMA is approximated by the pink rectangle.

Figure 3 shows the same area but zoomed in on the AQMA area.



**Figure 3** - Bias corrected and distance adjusted NO<sub>2</sub> annual means as measured by Swale Borough Council in 2018 (2019 ASR) for Teynham, around the AQMA. The Teynham/Lynsted AQMA is approximated by the pink rectangle.

SW80 is within 10% of the national limit of 40 µg/m. The value bias corrected, but not distance corrected for 2016 was 42.1 for SW80.

The junction with Lynsted Lane should be considered a high-risk area that is likely to be close or above the national limit for the majority of the year.

## 4. Proposal

### 4.1. NO<sub>2</sub>

The overall proposal is to monitor at seven new sites for a period of 12 months. The locations are now discussed

Given that the junction area of Lynsted Lane shows such high values, it would be prudent to examine in more detail the NO<sub>2</sub> around Station Road as the measurement point SW103 may not be representative of conditions both sides of the road. It could be that conditions around station road are indicative of the need for an AQMA extension.

Given the sensitivity of SW80 and its relevance to the AQMA, it would make sense to co-locate two diffusion tubes here, with the objective of creating a diffusion tube triplicate with SW80 in order to understand the precision of measurements in the area.

As there is a lack of monitoring between Lynsted Lane and Frognal lane, and no A2 monitoring around Frognal Lane it seems reasonable to propose two additional tubes: one between Lynsted Lane and Frognal Lane and one before the junction with Frognal lane but on the A2.

The approximate locations for this monitoring are shown in Figure 4



**Figure 4** - Proposed locations (approximate) for NO<sub>2</sub> diffusion tube monitoring in Teynham/Lynsted. White diamonds show the existing local authority monitoring locations.

#### 4.1.1. TEYN\_1 - Opposite Station Road



Not ideal because of the turbulence effects of a corner, but other options are worse. Close to junction so should capture any queuing buildup.

#### 4.1.2. TEYN\_2 - At Station Road Junction



Cars queue on Station Road. Would be interesting to see what effect this has on the pedestrian walkway.

#### 4.1.3. TEYN\_3 and TEYN\_4 - Near Teynham Chinese (SW80 Swale Council point)

Local authority point SW80 is listed as 107 London Road which is Teynham Chinese. It isn't clear exactly where they mount the tube, although the grid reference appears to coincide with a signpost outside the adjacent address. A site inspection will be required to confirm. It is proposed to mount two tubes here in co-location with SW80.



4.1.4. TEYN\_5 - 82 London Road (Veterinary Surgery), Southside Substitute for 118 London Road



This is a southside substitute for 118 London Road since it is still past Lynsted Lane and thus outside of the current AQMA and is the nearest southside pole to 118 London Road that is suitably canyonised.

#### 4.1.5. TEYN\_6 - 145/147 London Road (Northside) Dft point



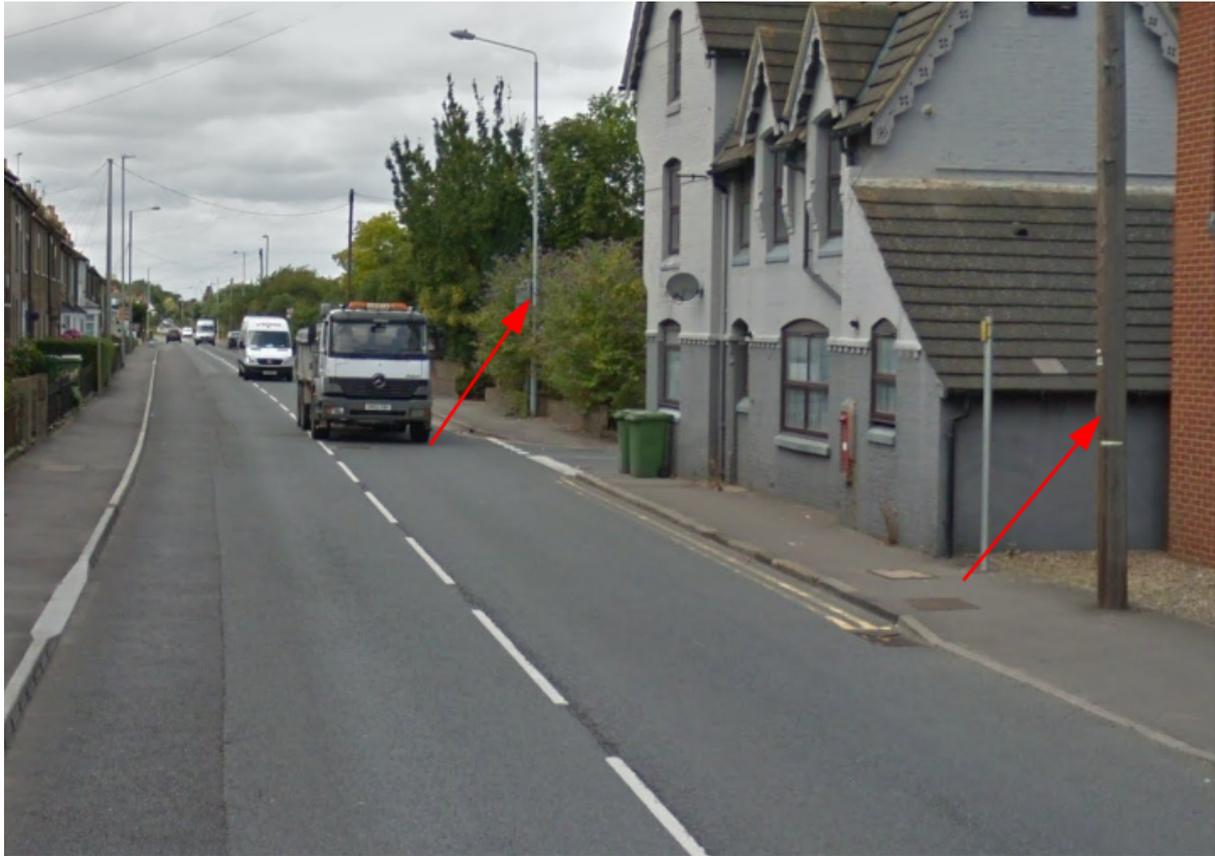
118 London Road (Crooked house) is on the Southside but there are not suitable mount points on the southside. Whereas 145/157 has a lamp-post outside. The point for the southside of the road could be moved up (see TEYN\_6)

#### 4.1.6. TEYN\_7 - Frogmal Lane



SBC already monitors NO<sub>2</sub> at the lamp-post just past Frogmal Lane so it wouldn't make sense to duplicate that. Instead the lamppost outside 154 could be used. If this proved to be an issue, then the telegraph pole outside of 150 could be used.



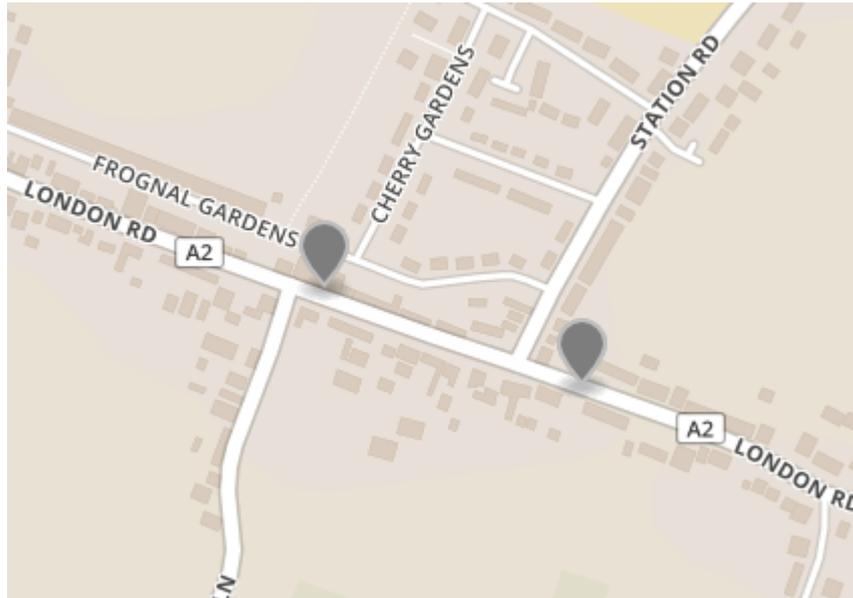


There are two potential locations near Frogmal Lane, either the lamp-post to the west, or telegraph pole to the east. The former is preferred on the assumption that the building works have been completed and the lamp-post now fronts a building.

## 4.2. Particulates

Given the complete absence of particulate monitoring in Teynham/Lynsted, we propose to get an estimate of particulate values through roadside monitoring using citizen-scientists and the loan of our equipment.

The junctions with the A2 of Lynsted Lane and Station Road would seem like sensible locations. The proposed locations are shown in Figure 5



**Figure 5** - Proposed locations (approximate) for citizen-science driven particulate monitoring.

### 4.3. Continuous monitoring

There is no continuous monitoring conducted in the Teynham/Lynsted AQMA, but the area has shops and bus-stops where people spend significant amounts of time.

To address this, it is proposed that a continuous monitor be mounted in an area of high footfall in Teynham/Lynsted for a period of one year.

Three Clarity continuous air quality monitors [2] shall be purchased for this purpose. The device is illustrated in Figure 6



**Figure 6** - Clarity continuous monitoring unit mounted to a pole

One monitor shall be co-located with the Ospringe Roadside 2 reference site, a continuous monitor maintained by SBC. This will serve to calibrate the monitoring against a known reference site with similar conditions as Ospringe Roadside 2 is on the A2 before Teynham.

The second and third monitors will be mounted in Teynham/Lynsted at a location of high footfall. It is proposed that one location be the Co-Op convenience store, but the exact location will be subject to the physical mounting constraints encountered (to be managed by Lynsted with Kingsdown Parish Council). The location of the third monitor will be subject to site investigation by Lynsted with Kingsdown Parish Council.

Figure 7 shows the relative locations of these proposed sites.



**Figure 7** - Relative locations of proposed continuous monitoring sites

Figure 8 - shows the ideal location (approximate) for continuous monitoring in Teynham/Lynsted.



**Figure 8** - Proposed location for continuous monitoring (approximate) in Teynham/Lynsted

The Co-op outside of which it is proposed to locate site B spans the boundary of the AQMA, it would be useful therefore to ensure that the mounting point is considered “within the AQMA” if possible.

Site C location is nominal, for illustration purposes only. Exact site location is TBD.

## 5. Traffic consultant

The Parish Council will hire a qualified traffic consultant at its own expense to provide an independent assessment of the local traffic with specific regard to the impact of proposed cumulative development on the traffic travelling through Teynham/Lynsted area and the AQMA.

## 6. Conditions of quote

The quote provided here is given on the assumption that Lynsted with Kingsdown Parish Council or delegated persons agree to the following responsibilities:

1. Mounting of and monthly exchange/mailing of diffusion tubes.

2. Mounting of continuous monitoring units and associated administrative tasks (obtaining permission from owner of mounting point)

## 7. Costs

<b>NO2 diffusion tube monitoring</b>			
<b>Item</b>	<b>Unit Cost (GBP, inc VAT)</b>	<b>Num Units</b>	<b>Line Cost (GBP, inc VAT)</b>
NO2 tubes	10.00	84	840.00
Tube clip	2.00	7	14.00
Tube strap	2.00	7	14.00
Initial setup + training	30.00	0	0.00
<b>TOTAL</b>	-	-	<b>868.00</b>
<b>Continuous pollutant monitoring</b>			
<b>Item</b>	<b>Unit Cost (GBP, inc VAT)</b>	<b>Num Units</b>	<b>Line Cost (GBP, inc VAT)</b>
Clarity unit	1000.00	3	3000.00
<b>TOTAL</b>	-	-	<b>3000.00</b>
<b>CHSS staff time</b>			
<b>Item</b>	<b>Unit Cost (GBP, inc VAT)</b>	<b>Num Units</b>	<b>Line Cost (GBP, inc VAT)</b>
CHSS AQ report (staff time)	1839.20	1	1839.20
<b>TOTAL</b>	-	-	<b>1839.20</b>
<b>TOTAL</b>	<b>5707.20</b>		

## 8. References

- [1] Swale Borough Council, '2019 Air Quality Annual Status Report (ASR)', Jun. 2019 [Online]. Available: <https://kentair.org.uk/Pagesfiles/Swale%20ASR%202019-%20final.pdf>
- [2] 'Clarity Movement Co. | Low-Cost Air Quality Monitoring & Measurement'. [Online]. Available: <https://www.clarity.io/>. [Accessed: 21-Feb-2021]