COVID-19: SUPPLEMENTARY GUIDANCE

Local Air Quality Management Reporting in 2021

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Contents

Introduction

This guidance is for local authorities in England (including London).

As a result of impacts from COVID-19 and the associated restrictions on activity, this document informs local authorities of the following changes and points of reference with respect to Local Air Quality Management (LAQM) duties, as described in Part IV of the Environment Act 1995, for the 2021 reporting year.

What Does this Guidance Cover?

This guidance has been informed by responses from the impact survey received following the release of the interim statement on COVID-19 impacts to the LAQM regime and addresses various aspects related to local authority duties under the regime.

There were two main themes arising from the LAQM COVID-19 impacts survey, those being:

1. Where effects of COVID-19 have had an impact on the collection of monitoring data, what is the significance of this and how should data be treated?
2. Where lack of resource due to COVID-19 commitments has affected LAQM duties through 2020 and 2021, how will this be addressed?

This guidance, which should be read in conjunction with the existing LAQM Technical Guidance LAQM.TG(16)[1] (or LLAQM.TG(19)[2] for London boroughs), addresses matters related to these issues and the impacts on the following:

- Delays to LAQM reporting;
- Reporting on COVID-19 in the 2021 Annual Status Report (ASR) or for London boroughs, the Air Quality Annual Status Report for 2020;
- Status of Air Quality Management Areas (AQMAs) and Air Quality Action Plans (AQAPs);
- Impacts on 2020 monitoring data and how data may be used;
- Diffusion tube bias adjustment; and
- LAQM tools.

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[1] https://laqm.defra.gov.uk/technical-guidance/

[2] https://www.london.gov.uk/sites/default/files/llaqm_technical_guidance_2019.pdf

Any outstanding queries following the receipt of this guidance should be raised with the LAQM Helpdesk[3].

Delays and Resourcing Constraints

Defra and the Greater London Authority are aware that measures put in place to combat the spread of COVID-19 may have impacted, and may continue to impact, local authority resources for air quality work which, therefore, may cause delays in statutory reporting.

The statutory deadline of 30th June (English authorities) and 31st May (London boroughs) for the year 2021 will remain but we will take a flexible and realistic approach when there is a risk that this deadline may be missed.

We will ask authorities to write to us if they require an extension due to COVID-19 for 2021 reporting, so we can consider and respond to requests based on the specific circumstances of each local authority. We will ask local authorities to do so by emailing Air.Quality@defra.gov.uk (English authorities) or poppy.lyle@london.gov.uk (London boroughs) outlining how resources have been impacted and the extension they wish to apply for.

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[3] https://laqm.defra.gov.uk/helpdesk/laqm-helpdesk.html

Reporting on COVID-19 in ASR Templates

Defra and the Greater London Authority have modified the [Annual Status Report (ASR) templates](#)[4] for 2021 reporting to include a bespoke '*Impact of COVID-19 upon LAQM*' section.

Standard lines to include are provided in Appendix F of the English 2021 ASR template, whist comparable prompts are provided in Section 2 of the ASR 2020 template for London boroughs. We encourage local authorities to summarise and discuss the local impacts of COVID-19 that have been observed (including instances where, for example, localised lockdowns were enforced that other areas may not have been subject to).

This section of the ASR will also be used to highlight and discuss the wider constraints caused by the COVID-19 pandemic, such as the ability of local authorities and their partners to implement air quality improvement measures. It may also be used to highlight any positive actions that have been taken within the local authority area in response to the pandemic, for example to promote walking and cycling as sustainable travel options.

If any detailed analysis of the impact of COVID-19 either on air pollutant concentrations directly, or on contributing factors to air quality (e.g. traffic) has been undertaken, local authorities are encouraged to include this within this section.

In consideration of the impacts of the pandemic on local authority resourcing, completion of this section is voluntary and not intended to unduly add to the reporting burden. Any supplementary information provided should aid the reader in understanding the context of the report set against the impacts of the pandemic.

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[4] https://laqm.defra.gov.uk/review-and-assessment/report-templates.html

Air Quality Management Area (AQMA) Status

We recognise that air pollutant concentrations may have been impacted by the change in activity observed across the UK as a result of COVID-19 and the associated measures. This may have led to changes in compliance with Air Quality Strategy objectives in AQMAs in the year 2020.

For English local authorities, as per LAQM.TG(16)[1] paragraph 3.49-3.53, current guidance states that it expects local authorities will consider measurements carried out over a period of three to five consecutive years when deliberating the revocation or amendment of an AQMA, as well as national trends in emissions and measures introduced as part of an Air Quality Action Plan (AQAP).

For London boroughs, as per LLAQM.TG(19)[2] paragraph 3.10, current guidance states that the last four years of monitoring data should be considered, and a trend analysis undertaken to identify any significant changes. Furthermore, in London a focus is required to be maintained on Particulate Matter even when meeting the PM_{10} targets, because the London boroughs are collectively working to meet the World Health Organization (WHO) health based $PM_{2.5}$ limits by 2030.

We advise against considering the revocation of an AQMA based solely upon compliance being achieved in 2020, as this year may not be representative of long-term trends in pollutant concentrations and we must be confident that air quality objectives will continue to be met in future years. Where 2020 is one of many (i.e. at least three) consecutive years of compliance, this may still be considered for revocation where the supporting evidence is considered suitably robust. If authorities wish to make any changes to AQMAs, whether declaration, amendment or revocation, based upon 2020 data, please contact the LAQM Helpdesk[3] to discuss your approach.

Air Quality Action Plan (AQAP) Status

The requirement to develop an AQAP ideally within 12 months of an AQMA being declared remains unchanged, as does the requirement to continually review and develop an existing AQAP. However, Defra recognises that COVID-19 may have impacted the progress of developing, implementing or measuring progress against measures contained within AQAPs.

In London, AQAPs are required to be updated every five years as a minimum and this requirement is still in place, as it is essential for authorities to have up to date plans.

Whilst it is recognised that local authority officer time is presently constrained in some local authorities, Defra would like local authorities to remain focused and proactive with respect to air quality action planning. We ask that these impacts are addressed and commented on within the COVID-19 impacts section of the ASR, where applicable. In addition, within this year's ASR, we would recommend exercising caution in interpreting the efficacy of improvement measures within 2020, as it is likely that the restrictions on activities will have had a notable impact on measured concentrations and the extent to which easing of lockdown measures results in a return to pre-pandemic concentrations of pollutants is still very uncertain.

Impacts on 2020 Monitoring Data

Since 2020 data is reflective of real-world events, we encourage presenting and discussing 2020 data. Authorities need to simply make clear how monitoring was impacted and, if appropriate, highlight that the data should be treated with caution. An impact matrix has been developed to assist local authorities with this (see Table 1). We also ask authorities to acknowledge that data from this year may differ significantly when compared with historical trends.

Passive Monitoring

Diffusion Tube Data Capture

Current guidance with respect to poor data capture remains in place. Where data capture is less than 75% of the year, annualisation techniques can be used to estimate an annual mean based on current guidance. There must be a minimum of three months of data available for annualisation.

Annualisation of Diffusion Tube Data

The ability to annualise data in line with current guidance may have also been impacted by COVID-19. We have considered the impacts of amending the criteria for annualisation, such as the relaxation of the 50-mile distance criteria and the most appropriate sites against which to annualise (i.e. background vs roadside sites). This analysis (undertaken on a select proportion of diffusion tube surveys) revealed that there was little impact on the annualisation process due to COVID-19, and that current guidance remains valid. Where possible, use of Automatic Urban and Rural Network (AURN) and/or London Air Quality Network (LAQN) monitoring stations should be prioritised over non-AURN/LAQN stations, since there is greater confidence in their data continuity and quality. We ask that local authorities continue to annualise their data in line with the current methodology as outlined within Box 7.10 of LAQM.TG(16)[1] (or Box 4.3 of LLAQM.TG(19)[2] for London boroughs). This can be completed through application of the LAQM Annualisation Tool[5] or the new Diffusion Tube Data Processing Tool[6].

The new Diffusion Tube Data Processing Tool should be used to process all diffusion tube data. The tool has been developed to more easily calculate annual mean concentrations

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[5] https://laqm.defra.gov.uk/tools-monitoring-data/annualisation.html

[6] https://laqm.defra.gov.uk/tools-monitoring-data/DTDP.html

for the diffusion tube monthly data, by amalgamating the following individual LAQM processing tools:

- Annualisation tool;
- Precision and accuracy tool – calculation of local bias; and
- NO$_2$ fall off with distance calculator.

The tool produces outputs that can be easily uploaded to the [LAQM Portal](#)[7] via the [Diffusion Tube Data Entry System (DTDES)](#) upload facility. The LAQM Portal has been developed to incorporate the previous Report Submission Website (RSW) and the Diffusion Tube Data Entry System (DTDES). This is to provide local authorities with a single access point to submit all relevant information regarding LAQM.

Diffusion Tube Exposure Periods

Guidance issued earlier in 2020 stipulated that where it was not safe to do so, or if resource needed to be deployed away from LAQM duties as a result of the pandemic, there was no expectation that local authority officers should expose diffusion tubes in line with the 2020 Diffusion Tube Monitoring Calendar dates. This may have meant that there are differing degrees of variance in exposure dates from the accepted exposure periods for sampling through the use of diffusion tubes.

Where this has been the case, as stipulated within [LAQM.TG(16)](#)[1] paragraph 7.197 for English local authorities (or [LLAQM.TG(19)](#)[2] paragraph 4.81 for London boroughs), it will be necessary to calculate a time weighted average to account for the variable exposure periods. The new [Diffusion Tube Data Processing Tool](#)[6] or [LAQM Annualisation Tool](#)[5] will automatically perform a time-weighted annual mean calculation, as opposed to a simple average calculation, if the required criteria are met. Where tubes have been exposed for longer than the period recommended by the laboratory that supplied and analysed the tubes, laboratory advice on the treatment of the data should be adhered to. In some cases, it will be necessary to exclude data exposed beyond the durations recommended by the [Diffusion Tube Monitoring Calendar](#)[8].

Diffusion Tube Storage

We are aware that exposed diffusion tube samples may have been stored for longer periods than usual and/or in less preferable conditions to how they would be normally stored as a result of the pandemic.

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[7] https://laqm.defra.gov.uk/laqmportal/

[8] https://laqm.defra.gov.uk/diffusion-tubes/data-entry.html

Again, laboratory advice should be adhered to on this point, and most laboratories will have issued storage advice which should have been followed. Diffusion tubes have a limited shelf life (typically 12 weeks from preparation), so data should be treated with caution if the tubes were stored or exposed for longer than this.

Diffusion Tube Bias Adjustment

The impact survey exercise provided an early indication of how local and national diffusion tube bias adjustment studies had been affected by COVID-19. However, around 62% of respondents indicated that their submission of a local bias study into the national survey was unaffected. 109 co-location studies have been returned and screened as suitable for inclusion. Therefore, the decision has been taken to continue the release of the national bias adjustment factors[9] within the usual cycle, and retain report submission deadlines as discussed previously in the section on Delays and Resourcing Constraints. Caution should always be exercised when applying a national bias adjustment factor based on a limited number of local surveys, particularly if they are at sites less comparable to those on which the factor is to be used. Discussion on the choice of bias factor and any perceived limitations of the bias factor applied to 2020 diffusion tube monitoring data should be discussed in the ASR – English local authorities should refer to Box 7.13 of LAQM.TG(16)[1] whilst London boroughs should refer to LLAQM.TG(19)[2] Box 4.4 for more information.

Changes to Diffusion Tube Supplier

The diffusion tube laboratories themselves were subject to the same restrictions as the rest of the UK during the initial March lockdown, and many were temporarily closed or encountered staffing difficulties. This may have led to the need to change diffusion tube supplier or type within the year. In such an instance, it is important to accurately consider the application of bias adjustment, that is, to apply an appropriate bias adjustment factor to each portion of the survey.

In order to apply an appropriate factor, English local authorities should utilise the methodology presented in Box 7.14 of LAQM.TG(16)[1], which is consistent with FAQ 138[10] for reference by London boroughs (*"How do I bias adjust my diffusion tube data if I change supplier and/or preparation method during the course of a year?"*).

The full methodology is published within the technical guidance and accompanying FAQ, but, in short, it is best practice to apply two separate bias factors across the relevant periods of exposure for each laboratory/preparation method, i.e. if Lab X has been used for four months of the year, apply a Lab X bias factor to those four months, and if Lab Y

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[9] https://laqm.defra.gov.uk/bias-adjustment-factors/national-bias.html

[10] https://laqm.defra.gov.uk/laqm-faqs/faq138.html

has been used for the next eight months of the year, use a Lab Y bias factor for those eight months. A weighted average relative to the two exposure periods should then be calculated to determine the final annual mean NO_2 concentration.

Continuous Monitoring

Data Quality

We are aware that COVID-19 may have given rise to changes to typical continuous monitoring procedures, either in relation to service and maintenance regimes, calibration regimes or independent audit regimes (QA/QC).

Responses to the impact survey found that the impact on local authority continuous monitoring data was very limited, as this method of data collection is far more automated than diffusion tubes. Therefore, it is not considered necessary to issue any additional guidance above and beyond the existing technical guidance on continuous monitoring, which for English local authorities may be found in [LAQM.TG(16)](#)[1] paragraph 7.174 onward. For London boroughs, please refer to [LLAQM.TG(19)](#)[2] paragraph 4.32 onward.

Impact Matrix

In order to communicate clearly with the public on the potential impact of COVID-19 on the data capture and quality of monitoring data collected during 2020, we have introduced an impact matrix to contextualise impacts on monitoring data from diffusion tubes and continuous analysers. This system indicates where readers need to treat data with more caution than usual, for example where data capture was less than 75% or tubes have been exposed outside of the usual time periods, or a combination of. Consideration is also given to the risks associated with preparation and implementation of AQAPs. This matrix is provided in Table 1.

Should your specific impacts differ slightly to the criteria provided within the matrix, professional judgement should be applied when determining the appropriate level of impact.

We encourage local authorities to comment on the impact of COVID-19 upon LAQM duties within Appendix F (England) and Section 2 (London boroughs) of the ASR. To assist in standardising the likely impact of construed constraints, it is recommended that discussion within this section of the ASR on constraints is accompanied by an appropriate impact rating, as determined using the impact matrix. As such, we are not requesting that local authorities populate the impact matrix in entirety. Rather, we are asking for only a summary of those impacts of COVID-19 upon LAQM considered most significant / key to the local authority to be discussed within this Section, with the impact matrix to be used to identify where small, medium or large impacts have occurred.

Note, this need only be used if/when COVID-19 has impacted on a particular parameter through 2020. We acknowledge that parameters such as data capture can be affected in a normal year, but we ask that local authorities use this to focus only on impacts caused by the pandemic. Guidance and examples are provided in Appendix F (England) of the ASR template.

Table 1 – Impact Matrix

Parameter	No Impact	Small Impact	Medium Impact	Large Impact
Automatic Monitoring – Data Capture (%)	More than 75% data capture	50 to 75% data capture	25 to 50% data capture	Less than 25% data capture
Automatic Monitoring – QA/QC Regime	Adherence to requirements as defined in LAQM.TG(16)	Routine calibrations taken place frequently but not to normal regime. Audits undertaken alongside service and maintenance programmes	Routine calibrations taken place infrequently and service and maintenance regimes adhered to. No audit achieved	Routine calibrations not undertaken within extended period (e.g. 3 to 4 months). Interruption to service and maintenance regime and no audit achieved
Passive Monitoring – Data Capture (%)	More than 75% data capture	50 to 75% data capture	25 to 50% data capture	Less than 25% data capture
Passive Monitoring – Bias Adjustment Factor	Bias adjustment undertaken as normal	<25% impact on normal number of available bias adjustment colocation studies (2020 vs 2019)	25-50% impact on normal number of available bias adjustment studies (2020 vs 2019)	>50% impact on normal number of available bias adjustment studies (2020 vs 2019) and/or applied bias adjustment factor studies not considered representative of local regime
Passive Monitoring – Adherence to Changeover Dates	Defra diffusion tube exposure calendar adhered to	Tubes left out for two exposure periods	Tubes left out for three exposure periods	Tubes left out for more than three exposure periods
Passive Monitoring – Storage of Tubes	Tubes stored in accordance with laboratory guidance and analysed promptly.	Tubes stored for longer than normal but adhering to laboratory guidance	Tubes unable to be stored according to be laboratory guidance but analysed prior to expiry date	Tubes stored for so long that they were unable to be analysed prior to expiry date. Data unable to be used
AQAP – Measure Implementation	Unaffected	Short delay (<6 months) in implementation of measures, but has been progressed to a degree	Long delay (>6 months) in implementation of measures, but has been progressed to a degree	No progression in implementation of measures
AQAP – New AQAP Development	Unaffected	Short delay (<6 months) in development of a new AQAP, but is on-going	Long delay (>6 months) in development of a new AQAP, but is on-going	No progression in development of a new AQAP

Impacts on LAQM Tools

The tools used by local authorities in their assessment of local air quality are subject to routine updates in line with new and revised data sets, accordingly. Whilst it is anticipated that a normal round of updates will take place in due course, these are dependent on the availability of data, which themselves are currently subject to closer scrutiny due to the pandemic. In the meantime, a summary of the potential impacts and possible mitigation strategies relating to each LAQM tool as a result of COVID-19 is summarised in Appendix A.

The intention of this is to provide local authorities with information to be considered when using these tools as part of their LAQM duties, professional judgement should be applied when determining the extent of impact for an individual assessment.

A full list of LAQM tools is available from the LAQM Support Website[11].

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[11] https://laqm.defra.gov.uk/review-and-assessment/tools/tools.html

Dispersion Modelling and Model Verification

This section provides consideration to dispersion modelling and verification used within the LAQM regime. It should be noted that this guidance is specific to LAQM duties for 2020 and 2021 assessment years, and the application of dispersion modelling and verification for planning related work will be left to the discretion of the individual Local Planning Authority, as is the current process.

LAQM.TG(16)[1] recommends that dispersion models used within the Review and Assessment process be verified against local monitoring data in order to improve their reliability in the local context in which they have been applied. The calculated verification factor(s) are then applied to subsequent modelling scenarios in the future, for example, in the case of action planning where the impact of future measures is being considered. The assumption underpinning this is that the relationships governing the derivation of pollutant concentrations within the verification year would hold true into the future.

The unusual nature of events in 2020 creates uncertainty with this assumption. The LAQM tools that include assumptions relating to present and projection trends, such as vehicle fleet turnover related forecasts and mapped background pollutant concentrations, on which road traffic modelling verification is often based, do not presently take account of the variations in activity, emissions and concentrations associated with lockdown restrictions and changed behaviours. If then applied to future assessment years, under an assumption that activity and concentrations will return more to pre-COVID-19 levels, there is a chance that future concentrations and impacts would be underestimated as a result.

An option would be to exclude the use of 2020 as a verification year, certainly until such time as it becomes clearer what the longer-term impacts of COVID-19 are / have been. The use of 2019 as a verification year would be recommended under such a direction, as the most recent year available without the effects of the pandemic. However, there are uncertainties as to whether changes to trends in both road traffic emissions and background concentrations have taken place and whether any changes would be likely to lead to longer-term shifts. This in turn could also lead to challenges and cost implications on LAQM projects (e.g. detailed modelling assessments, AQAPs) whose outcomes would be based on this more conservative approach in contravention, it could be argued, of real-world observations.

Such an assertion could also set a potentially unwelcome precedent, by assuming 2020 is anomalous. Whilst certainly different than preceding years, it is as yet uncertain whether future years will also be subject to similar events or indeed if the air quality benefits imposed by the pandemic will lead to long-term step-changes in pollutant concentrations, e.g. due to shifts in travel patterns and a higher proportion of home working. 2021 has already been affected by similar scale interventions.

To illustrate these potential challenges, a mock scenario is presented in Example 1. This is intended to represent the potential magnitude of change in model verification factors as a result of accounting for data impacted by COVID-19 and does not construe an example with regards to proposed methodology. It is intended to demonstrate the potential effect on overall concentration results when impacts of COVID-19 have not been suitably adjusted for when using the relevant LAQM assessment tools.

Example 1 – Effect of Assessment Year on Verification

<u>**2019 Based Verification**</u>

2019 NO_2 Monitored Concentration: 50 µg/m³

2019 NO_2 Background: 28 µg/m³

2019 Monitored Road NO_x: 46.6 µg/m³

2019 Modelled Road NO_x: 28 µg/m³

2025 Background: 23 µg/m³

2025 Modelled Road NO_x 'Do Minimum': 21 µg/m³

2025 Modelled Road NO_x 'Do Something': 22.5 µg/m³

2019 Verification Factor: 1.66

2025 Adjusted Modelled Road NO_x DM: 34.9 µg/m³

2025 Adjusted Modelled Road NO_x DS: 37.4 µg/m³

NO_2 µg/m³ impact in 2025:

Future 'Do Minimum' (without measure / scheme)	Future 'Do Something' (with measure / scheme	Impact
40.2	41.4	1.1

<u>**2020 Based Verification**</u>

2020 NO_2 Monitored Concentration: 42 µg/m³

2020 NO_2 Background: 27 µg/m³

2020 Monitored Road NO_x: 30.6 µg/m³

2020 Modelled Road NO_x: 26.5 µg/m³

2025 Background: 23 µg/m³

2025 Modelled Road NO_x 'Do Minimum': 21 µg/m³

2025 Modelled Road NO_x 'Do Something': 22.5 µg/m³

2020 Verification Factor: 1.15

2025 Adjusted Modelled Road NO_x DM: 24.2 µg/m³

2025 Adjusted Modelled Road NO_x DS: 26.0 µg/m³

NO_2 µg/m³ impact in 2025:

Future 'Do Minimum' (without measure / scheme)	Future 'Do Something' (with measure / scheme	Impact
35.2	36.1	0.8

In this example, simply using 2019 as the verification year in preference to 2020 creates a verification factor 44% higher (1.66 vs 1.15) and results in exceedance of the AQS objective within the assumed assessment year of 2025, whereas use of 2020 as the verification year results in a concentration compliant with the AQS objective in the assumed year of assessment of 2025.

Whilst this is an overly simplified, indicative scenario, it serves to illustrate that by not suitably accounting for the potential impacts from COVID-19 to the input assumptions applied to a 2020 baseline scenario for a detailed modelling study, outcomes for a future assessment year may be significantly impacted.

Considering prevailing uncertainties and potential sensitivities as discussed above, Defra do not advise the absolute exclusion of 2020 for consideration in detailed modelling studies undertaken for the purposes of LAQM Review and Assessment, under the proviso that the input parameters are appropriately considered and are as representative of 2020 as is possible. This may include adjusting vehicle fleet and/or background concentration projections based on local data reflective of COVID-19 impacts.

Extreme care should therefore be taken if utilising 2020 monitoring data for dispersion model verification. Local authorities should be aware of the underlying assumptions associated with the assessment tools, their impacts on the assessment being undertaken, and then appropriately adjust for these, as per the information provided in Appendix A. If adjustment at this stage is considered too complex and / or uncertain, the greater uncertainty associated with the model predictions should be borne in mind when considering conclusions and next steps. This will be particularly important if considering pollutant concentrations in future years.

Therefore, if using 2020 as a baseline year for the purposes of model verification, and until such a time that the LAQM tools are updated to be inclusive of the impacts of COVID-19, local authorities may wish to consider the inclusion of a sensitivity test exploring the potential constraints of both the estimation of the road contribution and the estimation of the background contribution. Potential sensitivity tests that may be included within LAQM detailed modelling studies are:

- Comparing results to a 2019 baseline year verification scenario; and / or
- Holding vehicle fleet and / or background concentrations constant (i.e. applying unadjusted 2020 data assumptions to the future assessment year).

Such sensitivity tests are likely to be more relevant if the model predicted concentrations in the future assessment year are exceeding or within 10% of the relevant air quality objective(s).

Authorities should contact the [LAQM Helpdesk](#)[3] to discuss the approach.

Appendix A: Potential Impacts to LAQM Tools

Table A.1 – Impact Rating Definitions for LAQM Tools

Impact Rating	Description
Negligible	Little to no impact and/or easy to address
Small	An impact worth caveating but unlikely to affect overall conclusions
Large	Potentially a large impact on reported concentrations and/or conclusions

Table A.2 – Potential Impacts to LAQM Tools

Number	Category	Tool	Supporting Data / Assumption(s)	Potential Impact(s)	Possible Mitigation	Impact Rating
1	**Monitoring**	Local Bias Adjustment and Precision Calculator[A]	Input local monitoring data and associated relationships between the two data sets	Local authority data quality may be affected by COVID-19 (missing months or lack of resource)	The tool accounts for standard deviation and coefficient of variation and screens these out from further consideration, so whilst there may be more periods excluded for poor data quality, the resultant factor should still be applicable	Negligible
2	**Monitoring**	National Bias Adjustment Factors[A]	Local authority co-location data submissions for 2020	Local authority data may be affected by COVID-19 (missing months or lack of resource); slow or non-submittal of results to national survey	Consider use of local factors and/or revising bias adjustment with later releases of a national survey, which should include more studies for each laboratory and preparation method	Small
3	**Monitoring**	Annualisation Tool[A]	Relationship between annual mean and short-term mean concentrations	Lockdown restrictions could have affected different site types disproportionately. Derivation of annual mean based on potentially vastly different activity levels than were apparent during shorter term survey period	Separate study looked at this relationship and found the use of background sites to annualise was still suitable, as similar drop offs in concentrations were seen as at roadside locations. Use of the Annualisation Tool remains the same	Negligible
4	**Monitoring**	Year Adjustment Factors for CO, benzene and 1,3 butadiene	Projections of these pollutants made on 2001, 2003 or 2010 based maps	Historic estimates made for 2020 to 2025 may not now hold true considering variation in activity associated with pandemic	Limited monitoring data are available, but a scaling factor could be derived based on the available data. These are marginal pollutants which are not often assessed for LAQM	Negligible
5	**Monitoring**	NO_2 Fall-off with Distance Calculator[A]	Observed relationship between NO_2 concentrations adjacent to road emissions source and drop off with distance from the source; calculation relies on input	Associated uncertainties likely to lie only with concentration data inputs - relationships between fall off and distance should remain the same	None required	Negligible

			monitoring and background data		
6	**Monitoring**	NO_x to NO_2 Calculator	Regional oxidants and f-NO_2	Estimate of final NO_2 concentration and input road NO_x concentrations may be affected	User define f-NO_2 values using f-NO_2 outputs from the EFT	Small
7	**Background**	Background Maps (NO_x, NO_2, PM_{10} and $PM_{2.5}$).	PCM modelled activity and emissions data from the NAEI and DfT	Activity and emissions data on which these are based will not have accounted for the impact of the COVID-19 in 2020 and beyond and so the resultant projected pollutant concentrations may not be reflective of actual pollution levels	Use of background monitoring data, where available; adjustment of monitoring data to different years using paragraph 7.70 of LAQM.TG(16) or, if more up-to-date trend data is known, background data may be adjusted e.g. using the NO_2 adjustment for NO_x sector removal tool	Large
8	**Background**	Background Maps (SO_2, CO, benzene & 1,3-butadiene)	As per row 4	As per row 4	As per row 4	Negligible
9	**Background**	NO_2 Adjustment for NO_x Sector Removal	Input data for components of NO_2 (background, road & non-road, etc); Regional oxidant and f-NO_2	Input data affected by COVID-19, as well as the regional oxidant and f-NO_2	Without update to the tool there is little that can be done to mitigate. The process would remain unchanged. Often relatively small components of the background are being removed so unlikely to have wide ranging impacts on assessment	Negligible
10	**Emissions**	Road Transport Emissions Factors Toolkit (EFT)	Fleet composition projections based on DfT / TfL / NAEI data; COPERT emissions factors; EEA emissions calcs; User defined input data on traffic flows and link composition	Assuming user input traffic data accounts for effect of COVID-19, emissions per vehicle should be largely unaffected, but the default Euro category and fleet compositions and turnover for 2020 and future years may be impacted, since the input assumptions are not inclusive of the effects of the COVID-19 on the vehicular industry nor in people's behaviour	Consider fleet turnover sensitivity scenarios - e.g. holding the year of assessment back to simulate a comparable delay to fleet turnover	Large

11	**Emissions**	Emission factors database	NAEI activity and emissions data	Activity data and emissions for 2020 and beyond doesn't account for COVID-19	None, unless updated	Large
12	**Emissions**	1 x 1 km emission estimates	As per row 7	As per row 7	As per row 7	Large
13	**Emissions**	Point source emission estimates	Facility; activity; pollutant or waste, as appropriate; each environmental medium (air, water, land) into which the pollutant is released; off-site transfers of waste and their destination; period trends	Activity data may be affected if the facility in question has had to alter operations due to COVID-19	Check with facility or other data sources	Small
14	**Screening**	DMRB	Relies on simple dispersion ratios and fleet composition data	As per row 10	As per row 10. Tool now not widely used for LAQM purposes so should have minimal impact	Negligible
15	**Screening**	Industrial Emissions Screening Tool	Total oxidant concentrations; background concentrations	Both oxidant and background concentrations are likely to have been affected by COVID-19	The user should consider amending these inputs, but provided they do, the use of the tool remains unchanged. The user may consider an update of figures at https://laqm.defra.gov.uk/review-and-assessment/tools/total-oxidant-concentrations.html using monitoring from 2020	Negligible
16	**Screening**	Stack Height Calculator for SO_2 from Small Boilers	Background concentration	Likely to have been reduced / affected by COVID-19 to some degree, although perhaps to a lesser extent than other pollutants since emissions sources are largely industrial	Account for any potential variation in background with up to date background concentrations. Not widely used as SO_2 now only a LAQM concern in very few places	Negligible
17	**Screening**	Biomass Emissions Screening Tool	Background concentration	Likely to have been reduced / affected by COVID-19 to some degree, although perhaps to a lesser extent than other sectors.	Account for any potential variation in background with up to date background concentrations. Use of the tool otherwise unchanged	Negligible

18	**Screening**	CHP Emissions Screening Tool	Screening nomograms	Unlikely to be impacted provided user is inputting up to date activity / emissions data	None required	Negligible
19	**Road Traffic**	Annual Average Daily Traffic Flows	Estimated and actual traffic counts	Traffic activity from 2020 onwards impacted by local and national lockdown measures and forecast data will not account for this unless explicitly stated	Check if data are manual counts of estimated impacts – such estimates for 2020 may not account for impacts of COVID-19	Large
20	**Road Traffic**	Road Traffic and Speed Statistics	General transport statistics compiled by DfT	Activity of all transport types likely to have been affected from 2020 onwards	Check data collection dates if pre- or post-COVID-19 Refer to the following datasets and consider their implication: • Quarterly traffic estimates are available for Great Britain's roads, covering quarters up to end September 2020. These are available at: https://www.gov.uk/government/collections/road-traffic-statistics • DfT has also published GB figures on the road traffic trends as part of its weekly publication on monitoring the impact of coronavirus (COVID-19) pandemic at: https://www.gov.uk/government/statistics/transport-use-during-the-coronavirus-covid-19-pandemic	Large
21	**Road Traffic**	TEMPRO	Traffic forecasts based on DfT projections	Does not currently account for COVID-19 impacts so any projections for 2020 and 2021, and possibly beyond, likely to be pessimistic	Apply as a conservative approach - consider sensitivity testing	Large

[A] The new Diffusion Tube Data Processing Tool consolidates all post-processing tools for diffusion tube monitoring, including annualisation, bias adjustment, fall off with distance and calculation of annual mean concentration. This may assist local authorities in the consideration of potential impacts and possible mitigation measures required for relevant aspects contained within Table A.1.