



# 2021 Air Quality Annual Status Report (ASR)

In fulfilment of Part IV of the Environment Act 1995  
Local Air Quality Management

Date: June, 2021

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## Executive Summary: Air Quality in Our Area

### Air Quality in Test Valley Borough Council

Air pollution is associated with a number of adverse health impacts. It is recognised as a contributing factor in the onset of heart disease and cancer. Additionally, air pollution particularly affects the most vulnerable in society: children, the elderly, and those with existing heart and lung conditions. There is also often a strong correlation with equalities issues because areas with poor air quality are also often less affluent areas<sup>1,2</sup>.

The mortality burden of air pollution within the UK is equivalent to 28,000 to 36,000 deaths at typical ages<sup>3</sup>, with a total estimated healthcare cost to the NHS and social care of £157 million in 2017<sup>4</sup>.

Due to the importance of the potential impact of poor air quality on health, Test Valley Borough Council (TVBC) is required to review and assess air quality within the Borough on a regular basis. This involves the production of an Annual Status Report by 30<sup>th</sup> June 2021 and is intended to maintain continuity in the Local Air Quality Management process. This report includes the results of on-going monitoring of Nitrogen Dioxide within the Borough where emissions from a range of sources could adversely impact sensitive receptors.

This Annual Status Report includes the results of nitrogen dioxide diffusion tube monitoring carried out in 2020, although the calendar for implementation was impacted by the Covi-19 Pandemic. Monitoring has indicated trends that are downward at all 17 sites and there is no evidence that the Annual Mean concentration of nitrogen dioxide may exceed the specific Air Quality Objective of 40µg/m<sup>3</sup>. It is recognised that the decrease in results this year is likely to be linked to a significant decrease in vehicles use due to lockdowns and travel restrictions. Based on the findings of this report, TVBC has found no

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<sup>1</sup> Public Health England. Air Quality: A Briefing for Directors of Public Health, 2017

<sup>2</sup> Defra. Air quality and social deprivation in the UK: an environmental inequalities analysis, 2006

<sup>3</sup> Defra. Air quality appraisal: damage cost guidance, July 2020

<sup>4</sup> Public Health England. Estimation of costs to the NHS and social care due to the health impacts of air pollution: summary report, May 2018

evidence that the levels of any other relevant pollutants may exceed the specific Air Quality Objectives and therefore has not identified the need to designate any Air Quality Management Areas.

TVBC undertakes Environmental Permitting of processes across its area which have the potential to cause pollution to atmosphere and engages with the Environment Agency where such sites fall within their remit. Through strategic planning we are working towards accessible and connected communities, in partnership with the County Council, who manage local highways infrastructure.

## Actions to Improve Air Quality

Whilst air quality has improved significantly in recent decades, and will continue to improve due to national policy decisions, there are some areas where local action is needed to improve air quality further.

The 2019 Clean Air Strategy<sup>5</sup> sets out the case for action, with goals even more ambitious than EU requirements to reduce exposure to harmful pollutants. The Road to Zero<sup>6</sup> sets out the approach to reduce exhaust emissions from road transport through a number of mechanisms; this is extremely important given that the majority of Air Quality Management Areas (AQMAs) are designated due to elevated concentrations heavily influenced by transport emissions.

TVBC takes its responsibilities for air quality very seriously and any proposals within the Borough are carefully assessed in accordance with the Local Plan. Development that would or could generate potentially significant levels of pollution will only be permitted if it can be demonstrated that there would not be any adverse impact on human health, the natural environment or general amenity.

TVBC will explore with Hampshire County Council (HCC) the possibility of identifying possible measures linking PM<sub>2.5</sub> with public health and how the success of reduction measures could best be measured.

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<sup>5</sup> Defra. Clean Air Strategy, 2019

<sup>6</sup> DfT. The Road to Zero: Next steps towards cleaner road transport and delivering our Industrial Strategy, July 2018

The southern part of the Test Valley Borough is encompassed by the Partnership for Urban South Hampshire (PUSH), Air Quality Impact Assessment, and we will continue to work with our neighbouring authorities to improve air quality for urban south Hampshire.

## Conclusions and Priorities

- No exceedances of the current Air Quality Objectives have been identified.
- The overall trends in the data have shown an improvement in air quality - see Figure A.1
- TVBC will continue to carefully consider future planning applications which may have the potential to impact air quality in Test Valley and within the vicinity of the Southampton Urban Area.
- The monitoring sites were reviewed and new areas targeted in 2019.

The implementation of lockdown and travel restrictions has shown a clear drop in Nitrogen Dioxide levels at our monitoring locations highlighting the value of targeting transport methods in order to improve local air quality.

## Local Engagement and How to get Involved

TVBC has posted information on the Council's website with regards to:

Air Quality:

<https://www.testvalley.gov.uk/housingandenvironmentalhealth/environmentalprotection/air-quality>

Sustainability:

<https://www.testvalley.gov.uk/aboutyourcouncil/corporatedirection/environmentandsustainability>

Travel Planning:

<https://www.testvalley.gov.uk/transportparkingandstreets/traffic-management/travelplans>  
<https://www.testvalley.gov.uk/news/2019/aug/bringing-the-town-together-with-new-travel-network>

Cycling and Walking:

<https://www.testvalley.gov.uk/communityandleisure/cyclingwalking>

With updates with regards to new sustainable travel initiatives such as, bus services, walking and cycling provision and residents travel plans:

<https://www.testvalley.gov.uk/communityandleisure/my-local-area-new/andover-romans/augusta-park/east-anton-augusta-park-community-travel-plan>

and

<https://www.testvalley.gov.uk/communityandleisure/my-local-area-new/andover-downlands/picket-piece/community-development-picket-piece>

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# 1 Local Air Quality Management

This report provides an overview of air quality in Test Valley Borough Council (TVBC) during 2020. It fulfils the requirements of Local Air Quality Management (LAQM) as set out in Part IV of the Environment Act (1995) and the relevant Policy and Technical Guidance documents.

The LAQM process places an obligation on all local authorities to regularly review and assess air quality in their areas, and to determine whether or not the air quality objectives are likely to be achieved. Where an exceedance is considered likely the local authority must declare an Air Quality Management Area (AQMA) and prepare an Air Quality Action Plan (AQAP) setting out the measures it intends to put in place in pursuit of the objectives. This Annual Status Report (ASR) is an annual requirement showing the strategies employed by Test Valley Borough Council to improve air quality and any progress that has been made.

The statutory air quality objectives applicable to LAQM in England are presented in Table E.1.

## 2 Actions to Improve Air Quality

### 2.1 Air Quality Management Areas

Air Quality Management Areas (AQMAs) are declared when there is an exceedance or likely exceedance of an air quality objective. After declaration, the authority should prepare an Air Quality Action Plan (AQAP) within 12 months setting out measures it intends to put in place in pursuit of compliance with the objectives.

Test Valley Borough Council currently does not have any declared AQMAs.

*The Council does utilise a number of local and regional plans and strategies in order to minimise and/or reduce potential impacts on air quality within the Borough. For example:*

- *Hampshire Local Plan (2011- 2031);*
- *Test Valley Borough Council Local Plan (2011 – 2029);*
- *Partnership for Urban South Hampshire Air Quality Impact Assessment (PUSH).*

*For reference, a map of TVBC's monitoring locations is available in Appendix D.*

**Table 2.1 – Declared Air Quality Management Areas**

Test Valley Borough Council has not declared any Air Quality Management Areas.

## 2.2 Progress and Impact of Measures to address Air Quality in Test Valley Borough Council

Defra's appraisal of last year's ASR concluded:

In the report, the Council has detailed extensive measures and plans to continue to address air quality within its administrative boundaries. These include to improve understanding of local air quality, encouraging the uptake of electric vehicles, Taxi licensing and awareness raising of air quality within the communities by activities such as walk to school schemes, walking/cycling guides available, salary sacrifice for cycles to name a few.

TVBC has taken forward a number of direct measures during the current reporting year of 2020 in pursuit of improving local air quality. Details of all measures completed, in progress or planned are set out in Table 2.2. 14 measures are included within Table 2.2, with the type of measure and the progress TVBC have made during the reporting year of 2020 presented. Where there have been, or continue to be, barriers restricting the implementation of the measure, these are also presented within Table 2.2.

More detail on these measures can be found in their respective Action Plans.

Copies of the main reference plans/strategies can be found via the web-links listed below:

Local Transport Plan (2011 – 2031)

<http://www3.hants.gov.uk/transport/local-transport-plan.htm>

Test Valley Borough Council's Local Plan (2011 – 2029)

<https://www.testvalley.gov.uk/planning-and-building/planningpolicy/local-development-framework/dpd>

Test Valley Borough Council's Renewable and Low Carbon Energy Study

<https://testvalley.gov.uk/assets/attach/12719/Test%20Valley%20Renewable%20and%20Low%20Carbon%20Energy%20Study.pdf>

Environmental Health website information

<https://www.testvalley.gov.uk/housingandenvironmentalhealth/environmentalprotection/air-quality>

TVBC's priorities for the coming year are to continue monitoring concentrations of nitrogen dioxide across the Borough, ensure that all proposed development is subject to scrutiny to ensure that compliance with Policy E8 of the Council's Local Plan and work with our neighbouring local authorities with regards to the non-compliance for nitrogen dioxide in the Southampton Urban Area Clean Air Zone.

The principal challenges and barriers to implementation that TVBC anticipates facing are that the main driver for air quality in the borough is traffic. Traffic management within the borough is largely beyond the control of TVBC, and is currently the responsibility of Hampshire County Council and Highways England.

Table 2.2 – Progress on Measures to Improve Air Quality

Measure No.	Measure	Category	Classification	Year Measure Introduced	Estimated / Actual Completion Year	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
1	Pocket Park	Traffic Management	Re-prioritising road space away from cars	2019	2020	Local Authority County Council	Developers & highway infrastructure funding	No	Funded	£500k - £1M	Completed	Reduced Vehicle Emissions		Work completed	Picture on cover
2	Bargain Farm and Nursling Park and Ride	Alternatives to Private Vehicle Use	Bus based park and ride	Under construction	2022	Local Authority	Developers	No	Funded	Unknown	Planning	Reduced Vehicle Emissions	Site allocated in current Borough Local Plan	Implementation ongoing	
3	Home Working/Agile Working	Promoting Travel Alternatives	Encourage/Facilitate Homeworking	2020	Ongoing	Local Authority	N/A	No	-	Savings	Implementation	Reduced Vehicle Emissions		Implementation ongoing	Pandemic highlighted potential, pilot underway to continue
4	Andover Airfield Business Park	Freight and Delivery Management	Route Management Plans/Strategic Routing	2010	Ongoing	Local Authority	Developers/Operators	No	Funded	Unknown	Implementation	Reduced Vehicle Emissions	TRO	Ongoing	
5	King Alfreds Cycleway	Transport Planning and Infrastructure	Cycle Network	2020	2020	Local Authorities (Wessex Region)	Mixed				Completed	Reduced Vehicle Emissions			
6	Environmental Permits	Environmental Permits	Introduction/Increase of environment charges through permit systems and economic instruments	Ongoing	Ongoing	Local Authority	Self-funding	No	Funded	Unknown	Ongoing	Reduction in Pollutants/Emissions	Permit compliance	Ongoing	Availability of experienced EHO's
7	Electric Vehicles and Plant	Policy Guidance and Development Control	Sustainable Procurement Guidance	2015	Ongoing	Local Authority	Budgets	No	Funded	Unknown	Ongoing	Reduction in Pollutants/Emissions		11 electric vehicles, 25 electric plant items and 3 dustcarts with electric bin lifts	
8	Community travel plans for new neighbourhoods	Transport Planning and Infrastructure	Public transport improvements – interchanges stations and services	2001	Ongoing	Local Authority Developers County Council	Developers	No	Funded	Unknown	Ongoing	Reduction in Pollutants/Emissions		Services in place for Picket Twenty, Picket Piece and Abbotswood	Phased development
9	Renewable and low carbon energy study	Policy Guidance and Development Control	Other Policy	2019	2020	Local Authority	Local Authority	No	Funded	£37,000	Completed	Reduction in Pollutants/Emissions		Study completed to highlight capacity in the area and assist sustainable development	
10	Local Cycling and Walking Infrastructure Plans	Transport Planning and Infrastructure	Cycle Network	2020	Ongoing/Long term	Local Authority County Council Sustrans	Shared	No	Unknown	Unknown	Planning	Reduced Vehicle Emissions		In planning and preparation stage	
11	Salary Sacrifice for Bicycles	Promoting Travel Alternatives	Promotion of Cycling	2012	Ongoing	Local Authority	Local Authority	No	Funded	Unknown	Ongoing	Reduced Vehicle Emissions			
12	Walking and Cycling Guides	Promoting Travel Alternatives	Promotion of Cycling/Walking	2010	Ongoing	Local Authority	Local Authority	No	Funded	Unknown	Ongoing	Reduced Vehicle Emissions		Available on website, promoted via social media and paper guides	
13	Travel Plan	Promoting Travel Alternatives	Promote use of rail and inland waterways	Updated 2015	Ongoing	Local Authority	Local Authority	No	Funded	Unknown	Ongoing	Reduction in Pollutants/Emissions		Ongoing	
14	Taxi Licensing	Promoting Low Emission Transport	Taxi Licensing Conditions	Updated 2014	Ongoing	Local Authority	Licence Fee	No	Funded	Unknown	Ongoing	Reduced Vehicle Emissions			Reviewed regularly

## 2.3 PM<sub>2.5</sub> – Local Authority Approach to Reducing Emissions and/or Concentrations

As detailed in Policy Guidance LAQM.PG16 (Chapter 7), local authorities are expected to work towards reducing emissions and/or concentrations of PM<sub>2.5</sub> (particulate matter with an aerodynamic diameter of 2.5µm or less). There is clear evidence that PM<sub>2.5</sub> has a significant impact on human health, including premature mortality, allergic reactions, and cardiovascular diseases.

According to 2018 data from PHE, the fraction of mortality attributable to particulate air pollution in the Test Valley area is 5.2%

(Source: <https://fingertips.phe.org.uk/profile/public-health-outcomes-framework/>). This level is better than the average for the South East region (5.6%) and the same as the England overall average.

TVBC is taking the following measures to address PM<sub>2.5</sub>:

Key sources of PM<sub>2.5</sub> include road traffic and industrial emissions and whilst TVBC only has a limited role in road traffic management it will continue to work with Hampshire County Council and Highways England in addition to Hampshire County Council's Public Health team and Public Health England to reduce PM<sub>2.5</sub> emissions wherever possible.

## 3 Air Quality Monitoring Data and Comparison with Air Quality Objectives and National Compliance

This section sets out the monitoring undertaken within 2020 by TVBC and how it compares with the relevant air quality objectives. In addition, monitoring results are presented for a five-year period between 2016 and 2020 to allow monitoring trends to be identified and discussed.

### 3.1 Summary of Monitoring Undertaken

#### 3.1.1 Automatic Monitoring Sites

TVBC does not currently have any automatic (continuous) monitoring sites.

#### 3.1.2 Non-Automatic Monitoring Sites

TVBC undertook non-automatic (i.e. passive) monitoring of NO<sub>2</sub> at 17 sites during 2020. Table A.2 in Appendix A presents the details of the non-automatic sites.

Maps showing the location of the monitoring sites are provided in Appendix D. Further details on Quality Assurance/Quality Control (QA/QC) for the diffusion tubes, including bias adjustments and any other adjustments applied (e.g. annualisation and/or distance correction), are included in Appendix C.

### 3.2 Individual Pollutants

The air quality monitoring results presented in this section are, where relevant, adjusted for bias, annualisation (where the annual mean data capture is below 75% and greater than 25%), and distance correction. Further details on adjustments are provided in Appendix C.

#### 3.2.1 Nitrogen Dioxide (NO<sub>2</sub>)

Table A.3 and Table A.4 in Appendix A compare the ratified and adjusted monitored NO<sub>2</sub> annual mean concentrations for the past five years with the air quality objective of 40µg/m<sup>3</sup>. Note that the concentration data presented represents the concentration at the location of the monitoring site, following the application of bias adjustment and

annualisation, as required (i.e. the values are exclusive of any consideration to fall-off with distance adjustment).

For diffusion tubes, the full 2020 dataset of monthly mean values is provided in Appendix B. Note that the concentration data presented in Table B.1 includes distance corrected values, only where relevant.

**Error! Reference source not found.** in Appendix A compares the ratified continuous monitored NO<sub>2</sub> hourly mean concentrations for the past five years with the air quality objective of 200µg/m<sup>3</sup>, not to be exceeded more than 18 times per year.

### 3.2.2 Particulate Matter (PM<sub>10</sub>)

Test Valley Borough Council does not monitor for PM<sub>10</sub>.

### 3.2.3 Particulate Matter (PM<sub>2.5</sub>)

Test Valley Borough Council does not monitor for PM<sub>2.5</sub>.

### 3.2.4 Sulphur Dioxide (SO<sub>2</sub>)

Test Valley Borough Council does not monitor for SO<sub>2</sub>.

## Appendix A: Monitoring Results

### Table A.1 – Details of Automatic Monitoring Sites

Test Valley Borough Council does not have any Automatic Monitoring Sites

Table A.2 – Details of Non-Automatic Monitoring Sites

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) <sup>(1)</sup>	Distance to kerb of nearest road (m) <sup>(2)</sup>	Tube Co-located with a Continuous Analyser?	Tube Height (m)
TEV/20A/NA1S1	<b>Winchester Road - East</b>	Roadside	436129	121398	NO <sub>2</sub>	NO	0.0	1.0	No	1.5
TEV/20A/NA1S2	<b>Duttons Road</b>	Roadside	435376	121786	NO <sub>2</sub>	NO	0.0	1.5	No	2.0
TEV/20A/NA1S3	<b>Palmerstons Street - West</b>	Roadside	435474	121089	NO <sub>2</sub>	NO	0.0	1.3	No	2.0
TEV/20A/NA1S4	<b>Romsey (A27) By-pass</b>	Roadside	434927	120689	NO <sub>2</sub>	NO	0.0	3.0	No	2.0
TEV/20A/NA1S5	<b>Palmerstons Street - East</b>	Roadside	435473	121125	NO <sub>2</sub>	NO	0.0	2.0	No	1.8
TEV/20A/NA1S6	<b>Winchester Road - West</b>	Roadside	436075	121387	NO <sub>2</sub>	NO	0.0	1.5	No	2.0
TEV/20A/NA1S7	<b>Alma Road (South)</b>	Roadside	435597	121244	NO <sub>2</sub>	NO	0.0	2.0	No	2.0
TEV/20A/NA1S8	<b>Alma Road (North)</b>	Roadside	435630	121403	NO <sub>2</sub>	NO	0.0	2.6	No	2.0
TEV/20A/NA1S9	<b>Chilworth Road</b>	Roadside	441760	118091	NO <sub>2</sub>	NO	0.0	1.0	No	2.0
TEV/20A/NA1S10	<b>Nursling Street, Nursling</b>	Roadside	436991	116319	NO <sub>2</sub>	NO	0.0	0.5	No	2.0
TEV/20A/NA1S11	<b>North Baddesley</b>	Roadside	439617	119978	NO <sub>2</sub>	NO	0.0	2.0	No	1.5
TEV/20A/NA1S12	<b>Kings Somborne</b>	Roadside	435869	130958	NO <sub>2</sub>	NO	0.0	1.5	No	1.5
TEV/20A/NA1S13	<b>Weyhill (A342), Andover</b>	Roadside	432084	146585	NO <sub>2</sub>	NO	0.0	2.5	No	1.5
TEV/20A/NA1S14	<b>Humberstone Road (East)</b>	Roadside	436498	144936	NO <sub>2</sub>	NO	0.0	1.5	No	2.0
TEV/20A/NA1S15	<b>Little Ann (A343)</b>	Roadside	433514	143078	NO <sub>2</sub>	NO	0.0	2.0	No	2.0
TEV/20A/NA1S16	<b>Nursling (A3057)</b>	Roadside	437747	116652	NO <sub>2</sub>	NO	0.0	1.5	No	1.5

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) <sup>(1)</sup>	Distance to kerb of nearest road (m) <sup>(2)</sup>	Tube Co-located with a Continuous Analyser?	Tube Height (m)
TEV/20A/NA1S17	<b>New Street, Andover</b>	Roadside	436682	146683	NO <sub>2</sub>	NO	0.0	1.5	No	2.4

**Notes:**

(1) 0m if the monitoring site is at a location of exposure (e.g. installed on the façade of a residential property).

(2) N/A if not applicable.

**Table A.3 – Annual Mean NO<sub>2</sub> Monitoring Results: Automatic Monitoring (µg/m<sup>3</sup>)**

Test Valley Borough Council does not have any Automatic Monitoring Sites

**Table A.4 – Annual Mean NO<sub>2</sub> Monitoring Results: Non-Automatic Monitoring (µg/m<sup>3</sup>)**

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) <sup>(1)</sup>	Valid Data Capture 2020 (%) <sup>(2)</sup>	2016	2017	2018	2019	2020
TEV/20A/NA1S1	436129	121398	Roadside	100	66.6	-	-	-	35.28	32.2
TEV/20A/NA1S2	435376	121786	Roadside	100	66.6	-	-	-	24.51	21.8
TEV/20A/NA1S3	435474	121089	Roadside	100	66.6	33.5	30.7	29.3	30.14	23.9
TEV/20A/NA1S4	434927	120689	Roadside	100	58.3	-	-	-	22.51	18.6
TEV/20A/NA1S5	435473	121125	Roadside	100	66.6	-	-	-	25.35	21.8
TEV/20A/NA1S6	436075	121387	Roadside	100	66.6	28.5	26.3	26.6	27.85	21.8
TEV/20A/NA1S7	435597	121244	Roadside	100	66.6	26.5	26.4	26.6	24.41	18.8
TEV/20A/NA1S8	435630	121403	Roadside	100	66.6	26.4	26.6	25.9	25.11	18.9
TEV/20A/NA1S9	441760	118091	Roadside	100	66.6	26.4	26.6	30.0	30.34	22.3
TEV/20A/NA1S10	436991	116319	Roadside	100	66.6	-	-	-	29.09	26.4
TEV/20A/NA1S11	439617	119978	Roadside	100	66.6	-	-	-	30.59	25.4
TEV/20A/NA1S12	435869	130958	Roadside	83.3	41.6				16.53	11.8
TEV/20A/NA1S13	432084	146585	Roadside	100	50	26.5	26.4	26.6	16.77	15.4
TEV/20A/NA1S14	436498	144936	Roadside	100	58.3	-	-	-	16.53	14.1
TEV/20A/NA1S15	433514	143078	Roadside	100	66.6	-	-	-	24.26	18.7
TEV/20A/NA1S16	437747	116652	Roadside	100	66.6	-	-	-	26.75	21.3
TEV/20A/NA1S17	436682	146683	Roadside	100	50	-	-	-	35.43	30.2

Annualisation has been conducted where data capture is <75% and >25% in line with LAQM.TG16

Diffusion tube data has been bias adjusted.

Reported concentrations are those at the location of the monitoring site (bias adjusted and annualised, as required), i.e. prior to any fall-off with distance correction.

#### Notes:

The annual mean concentrations are presented as µg/m<sup>3</sup>.

Exceedances of the NO<sub>2</sub> annual mean objective of 40µg/m<sup>3</sup> are shown in **bold**.

NO<sub>2</sub> annual means exceeding 60µg/m<sup>3</sup>, indicating a potential exceedance of the NO<sub>2</sub> 1-hour mean objective are shown in **bold and underlined**.

Means for diffusion tubes have been corrected for bias. All means have been “annualised” as per LAQM.TG16 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

Concentrations are those at the location of monitoring and not those following any fall-off with distance adjustment.

(1) Data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

(2) Data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

**Figure A.1 – Trends in Annual Mean NO<sub>2</sub> Concentrations**

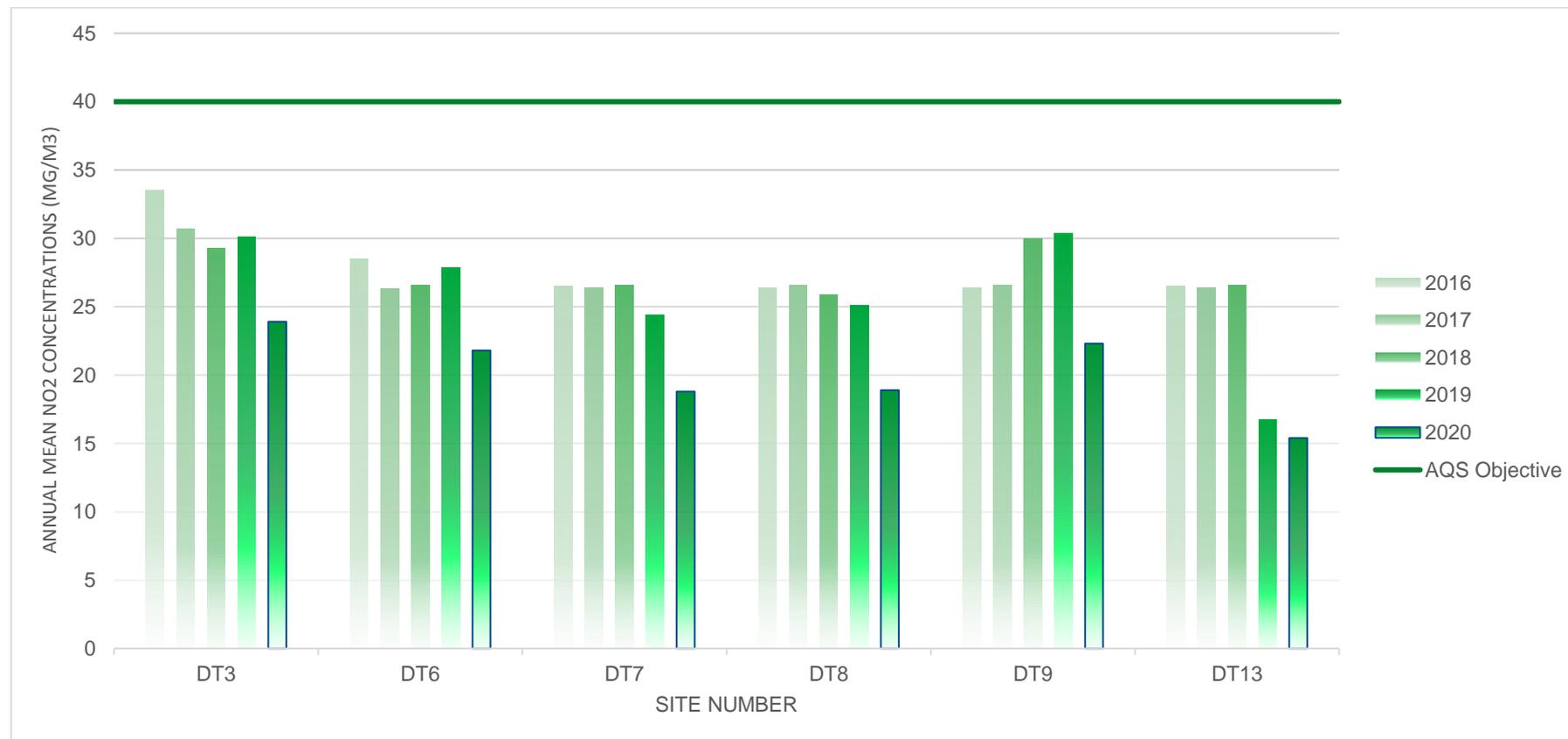


Figure A.1 presents NO<sub>2</sub> µg/m<sup>3</sup> annual mean concentrations for sites DT3, 6, 7, 8, 9 and 13 between years 2016 to 2020. There are no exceedances of the annual mean objective in 2020 and there is a general trend of reduction, although DT9 close to the M27 was showing a slight increase before the Covid-19 pandemic. The tubes not represented here were re-located in 2019 and so there is at present a limited data-set.

## Appendix B: Full Monthly Diffusion Tube Results for 2020

Table B.1 – NO<sub>2</sub> 2020 Diffusion Tube Results (µg/m<sup>3</sup>)

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Easting)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted	Annual Mean: Distance Corrected to Nearest Exposure	Comment
NA1S <sub>1</sub>	439129	121398	54.3	40.6	17.8*				30.2	36.0	43.0	45.5	46.0	41.0	41.8	32.2	32.2	Pandemic issues and staff limitations affected March to June
NA1S <sub>2</sub>	43536	121786	34.7	22.0	17.0*				17.0	23.1	27.3	30.6	39.4	31.9	28.3	21.8	21.8	Pandemic issues and staff limitations affected March to June
NA1S <sub>3</sub>	435474	121089	37.7	36.5	14.1*				22.1	28.1	30.9	31.7	31.7	31.5	31.1	23.9	23.9	Pandemic issues and staff limitations affected March to June
NA1S <sub>4</sub>	434927	120689	32.1	21.0	14.1*				16.2	21.8	22.9	24.0	28.3	x	23.6	18.6	18.6	Pandemic issues and staff limitations affected March to June, December tube missing
NA1S <sub>5</sub>	435473	121125	46.2	37.8	17.6*				20.5	23.4	22.3	22.9	25.7	29.6	28.3	21.8	21.8	Pandemic issues and staff limitations affected March to June
NA1S <sub>6</sub>	436075	121387	30.8	21.5	16.8*				14.4	27.2	30.3	30.2	39.2	32.7	28.3	21.8	21.8	Pandemic issues and staff limitations affected March to June
NA1S <sub>7</sub>	435597	121244	35.9	26.2	18.3*				18.3	22.1	15.7	25.7	26.6	25.3	24.4	18.8	18.8	Pandemic issues and staff limitations affected March to June
NA1S <sub>8</sub>	435630	121403	26.0	24.5	14.5*				17.0	24.1	24.3	24.8	30.3	25.9	24.6	18.9	18.9	Pandemic issues and staff limitations affected March to June
NA1S <sub>9</sub>	441760	118091	24.6	32.3	18.2*				20.3	29.6	27.3	30.6	35.9	31.3	29.0	22.3	22.3	Pandemic issues and staff limitations affected March to June
NA1S <sub>10</sub>	436991	116319	40.3	37.6	24.5*				28.8	30.6	35.7	36.3	36.8	29.7	34.2	26.4	26.4	Pandemic issues and staff limitations affected March to June
NA1S <sub>11</sub>	439617	119978	47.6	34.7	15.8*				21.3	28.7	30.4	30.9	38.3	33.3	32.9	25.4	25.4	Pandemic issues and staff limitations affected March to June
NA1S <sub>12</sub>	435869	130958								14.8	12.8	14.8	18.9	18.1	16.1	11.8	11.8	Tubes taken January and February, Clip stolen between March and July, July tube not exposed
NA1S <sub>13</sub>	432084	146585		28.9						17.9	19.9	14.6	24.0	18.9	20.6	15.4	15.4	Tube taken January, Clip stolen between March and July, July tube not exposed
NA1S <sub>14</sub>	436498	144936		19.4					8.7	14.8	15.5	17.6	25.3	22.5	17.8	14.1	14.1	Tube taken January and March
NA1S <sub>15</sub>	433514	143078	33.7	25.6	12*				15.9	23.3	23.9	21.1	29.1	23.5	24.3	18.7	18.7	Pandemic issues and staff limitations affected March to June. Water and dirt in February tube, water in December tube.
NA1S <sub>16</sub>	437747	116652	34.9	21.8	21.1*				19.3	25.8	29.0	26.9	32.8	31.3	27.7	21.3	21.3	Pandemic issues and staff limitations affected March to June
NA1S <sub>17</sub>	436682	146683	48.4	x	25.6*				24.1	40.8	41.4	37.6	42.7	x	38.8	30.2	30.2	Pandemic issues and staff limitations affected March to June, February and December tubes missing

☒ All erroneous data has been removed from the NO<sub>2</sub> diffusion tube dataset presented in Table B.1.

- Annualisation has been conducted where data capture is <75% and >25% in line with LAQM.TG16.
- Local bias adjustment factor used.
- National bias adjustment factor used.
- Where applicable, data has been distance corrected for relevant exposure in the final column.
- Test Valley Borough Council confirm that all 2020 diffusion tube data has been uploaded to the Diffusion Tube Data Entry System.

**Notes:**

\*- March tubes were exposed until the end of June.

X – tube missing.

Exceedances of the NO<sub>2</sub> annual mean objective of 40µg/m<sup>3</sup> are shown in **bold**.

NO<sub>2</sub> annual means exceeding 60µg/m<sup>3</sup>, indicating a potential exceedance of the NO<sub>2</sub> 1-hour mean objective are shown in **bold and underlined**.

See Appendix C for details on bias adjustment and annualisation.

## Appendix C: Supporting Technical Information / Air Quality Monitoring Data QA/QC

### New or Changed Sources Identified Within Test Valley Borough Council During 2020

TVBC has not identified any new significant sources of pollution since the publication of the Council's 2019 Air Quality Annual Status Report. There has clearly been a significant decrease in road traffic for much of 2020 as a result of the Covid-19 Pandemic.

### Additional Air Quality Works Undertaken by Test Valley Borough Council During 2020

TVBC has not completed any additional works within the reporting year of 2020.

Concerns were raised about pollution from road traffic in 3 locations within our area so initial modelling was undertaken to assess whether monitoring might be necessary.

Findings were as follows:

Location	Predicted NO <sub>2</sub> µg/m <sup>3</sup>
Winchester Hill, Romsey	24.53
Charlton Road, Andover	18.04
Stockbridge High Street	21.19

These predictions are in line with some of our existing monitoring locations and do not suggest a need for further monitoring in these locations at this time.

## QA/QC of Diffusion Tube Monitoring

The diffusion tubes used by TVBC are supplied and analysed (50% TEA in Acetone) by Socotec Laboratories, Didcot, Oxfordshire. They are a UKAS accredited laboratory carrying the highest ranking of satisfactory and participate in the AIR-PT intercomparison scheme.

The tubes put out in March (4<sup>th</sup> March 2020) were not collected in until the start of July (1<sup>st</sup> July 2020) due to the impact of the Covid-19 pandemic. The results have been included within Table B1 for information but were not included within the annualisation calculation.

### Diffusion Tube Annualisation

Annualisation was undertaken for all TVBC monitoring sites in 2020 as all had data capture or less than 75% and greater than 25%. Details of the calculation undertaken are provided in table C.2.

### Diffusion Tube Bias Adjustment Factors

The diffusion tube data presented within the 2020 ASR have been corrected for bias using an adjustment factor. Bias represents the overall tendency of the diffusion tubes to under or over-read relative to the reference chemiluminescence analyser. LAQM.TG16 provides guidance with regard to the application of a bias adjustment factor to correct diffusion tube monitoring. Triplicate co-location studies can be used to determine a local bias factor based on the comparison of diffusion tube results with data taken from NO<sub>x</sub>/NO<sub>2</sub> continuous analysers. Alternatively, the national database of diffusion tube co-location surveys provides bias factors for the relevant laboratory and preparation method.

TVBC have applied a national bias adjustment factor of 0.77 to the 2020 monitoring data as per the 03/20 national spreadsheet. A summary of bias adjustment factors used by Test Valley Borough Council over the past five years is presented in Table C.1.

Of the 22 studies which used ESG (50% TEA in Acetone) diffusion tubes during 2020, all 22 studies indicated 'Good' precision.

**Table C.1 – Bias Adjustment Factor**

Year	Local or National	If National, Version of National Spreadsheet	Adjustment Factor
2020	National	03/21	0.77
2019	National	09/20	0.77
2018	National	06/19	0.77
2017	National	09/18	0.77
2016	National	06/17	0.81

### **NO<sub>2</sub> Fall-off with Distance from the Road**

Wherever possible, local authorities should ensure that monitoring locations are representative of exposure. However, where this is not possible, the NO<sub>2</sub> concentration at the nearest location relevant for exposure should be estimated using the Diffusion Tube Data Processing Tool/NO<sub>2</sub> fall-off with distance calculator available on the LAQM Support website. Where appropriate, non-automatic annual mean NO<sub>2</sub> concentrations corrected for distance are presented in Table B.1.

No diffusion tube NO<sub>2</sub> monitoring locations within TVBC required distance correction during 2020.

### **QA/QC of Automatic Monitoring**

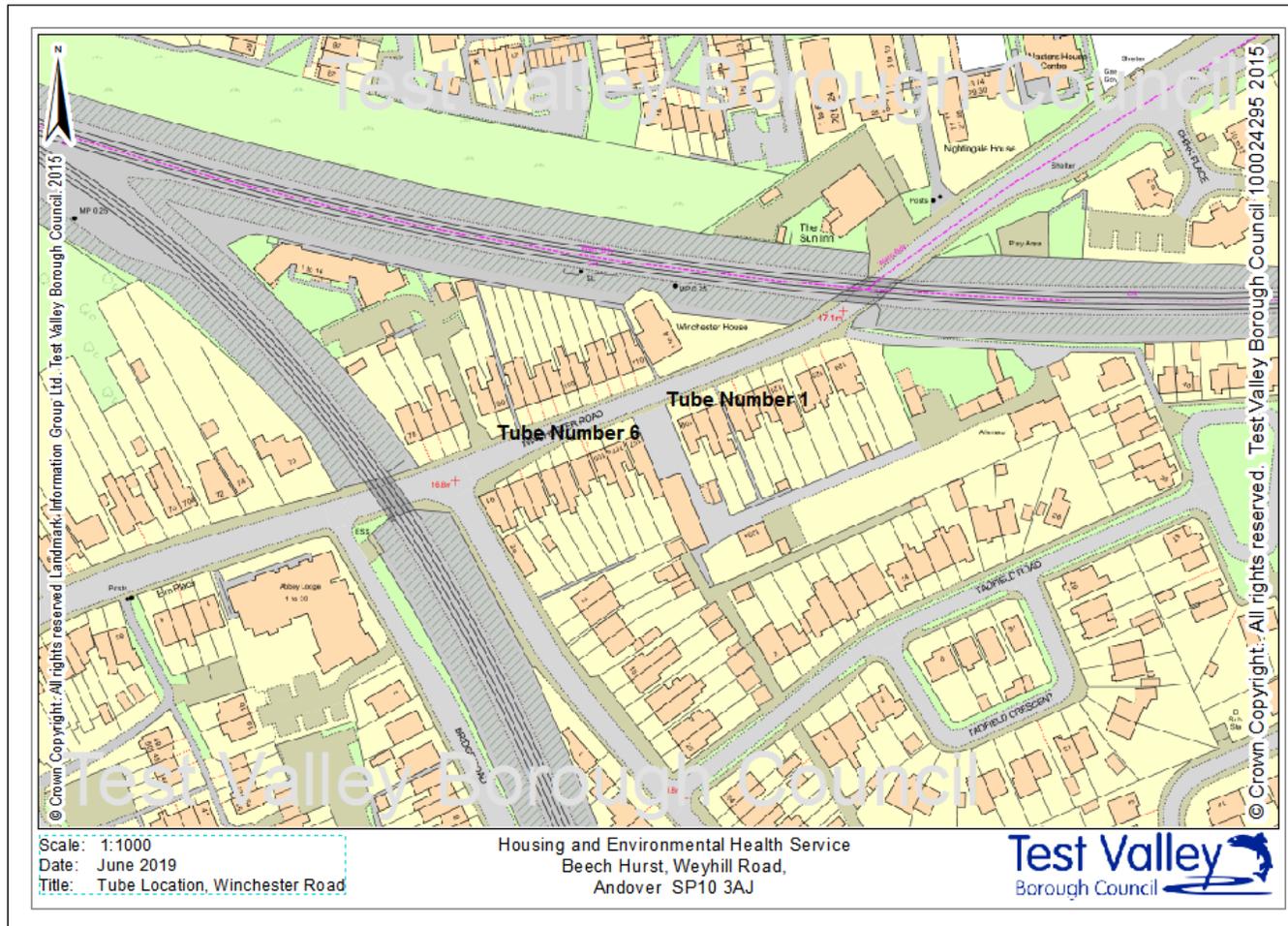
Test Valley Borough Council does not undertake automatic monitoring.

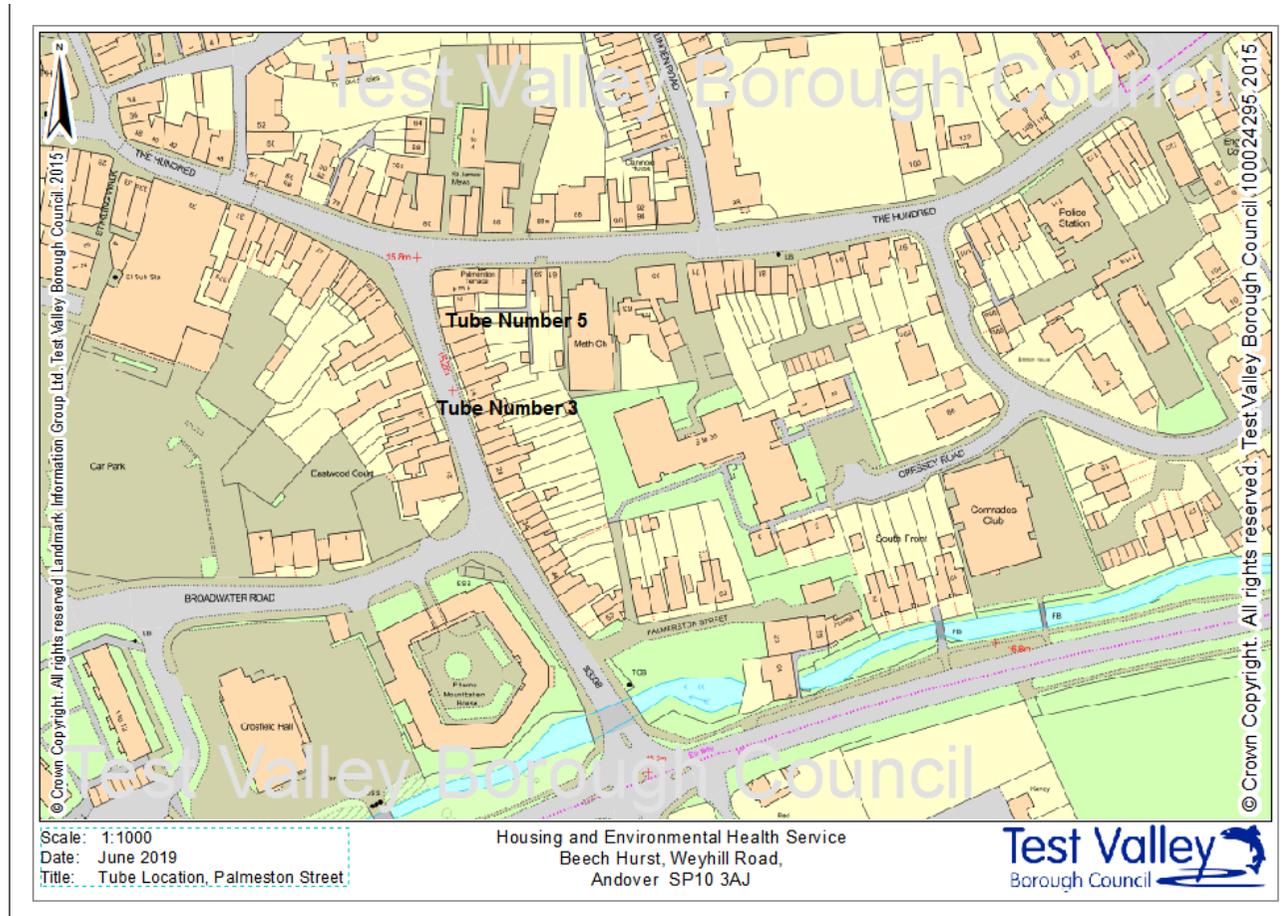
Table C.2 – Annualisation Summary (concentrations presented in  $\mu\text{g}/\text{m}^3$ )

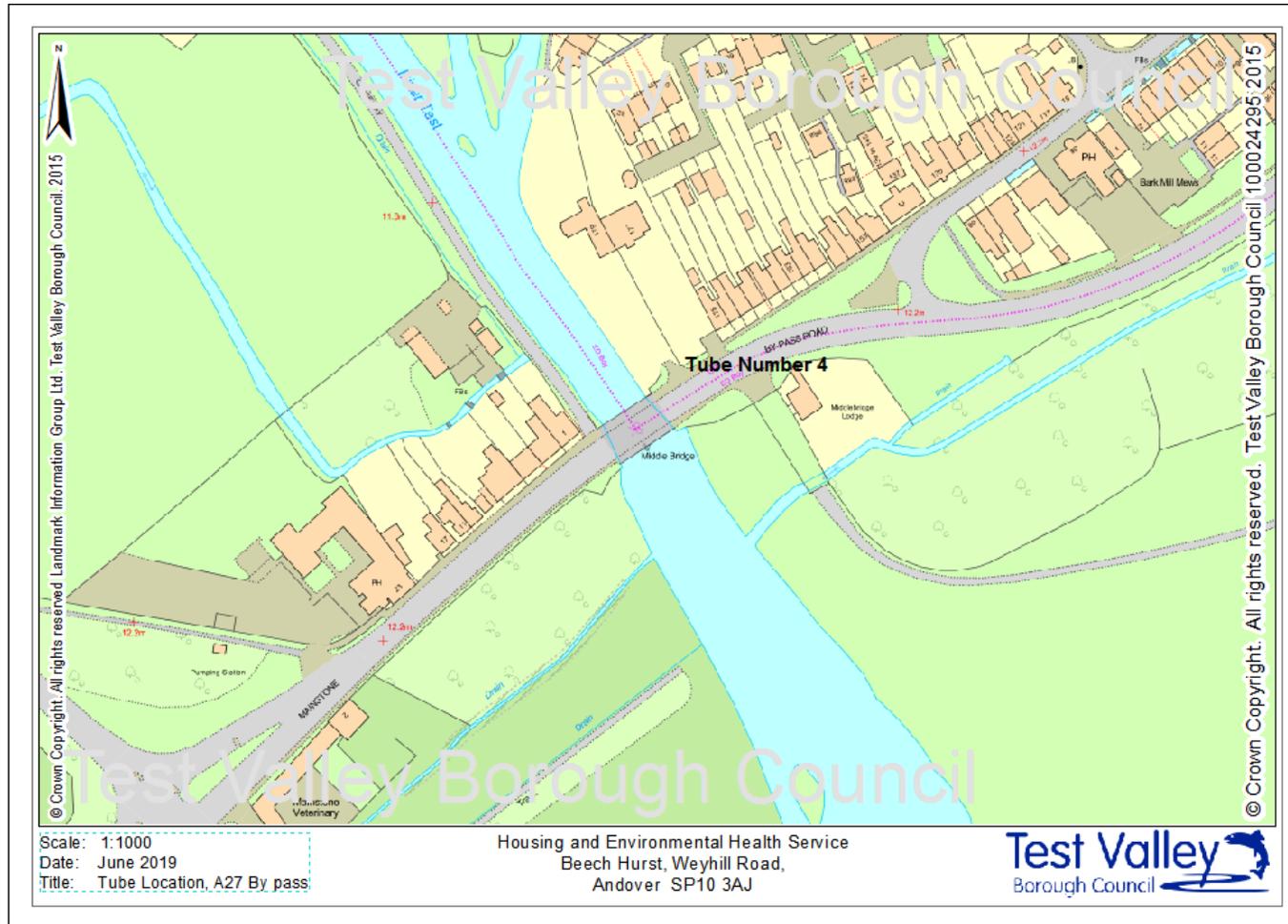
Site ID	Annualisation Factor Chilbolton Observatory	Annualisation Factor Southampton A33	Annualisation Factor Reading New Town	Average Annualisation Factor	Raw Data Annual Mean	Annualised Annual Mean	Comments
TEV/20A/NA1S1	1.0756	0.9533	0.9716	1.0002	41.8	41.8	4 <sup>th</sup> local (within 50 miles) source of annualisation data had incomplete data for 2020
TEV/20A/NA1S2	1.0756	0.9533	0.9716	1.0002	28.3	28.3	
TEV/20A/NA1S3	1.0756	0.9533	0.9716	1.0002	31.1	31.1	
TEV/20A/NA1S4	1.1029	0.9560	1.0003	1.0197	23.6	24.1	
TEV/20A/NA1S5	1.0756	0.9533	0.9716	1.0002	28.3	28.3	
TEV/20A/NA1S6	1.0756	0.9533	0.9716	1.0002	28.3	28.3	
TEV/20A/NA1S7	1.0756	0.9533	0.9716	1.0002	24.4	24.4	
TEV/20A/NA1S8	1.0756	0.9533	0.9716	1.0002	24.6	24.6	
TEV/20A/NA1S9	1.0756	0.9533	0.9716	1.0002	29.0	29.0	
TEV/20A/NA1S10	1.0756	0.9533	0.9716	1.0002	34.2	34.3	
TEV/20A/NA1S11	1.0756	0.9533	0.9716	1.0002	32.9	32.9	
TEV/20A/NA1S12	0.9542	0.9695	0.9446	0.9561	16.1	15.4	
TEV/20A/NA1S13	1.0169	0.9496	0.9458	0.9708	20.6	20.0	
TEV/20A/NA1S14	1.0846	0.9916	1.0215	1.0326	17.8	18.3	
TEV/20A/NA1S15	1.0756	0.9533	0.9716	1.0002	24.3	24.3	
TEV/20A/NA1S16	1.0756	0.9533	0.9716	1.0002	27.7	27.7	
TEV/20A/NA1S17	1.0532	0.9734	1.0084	1.0117	38.8	39.2	

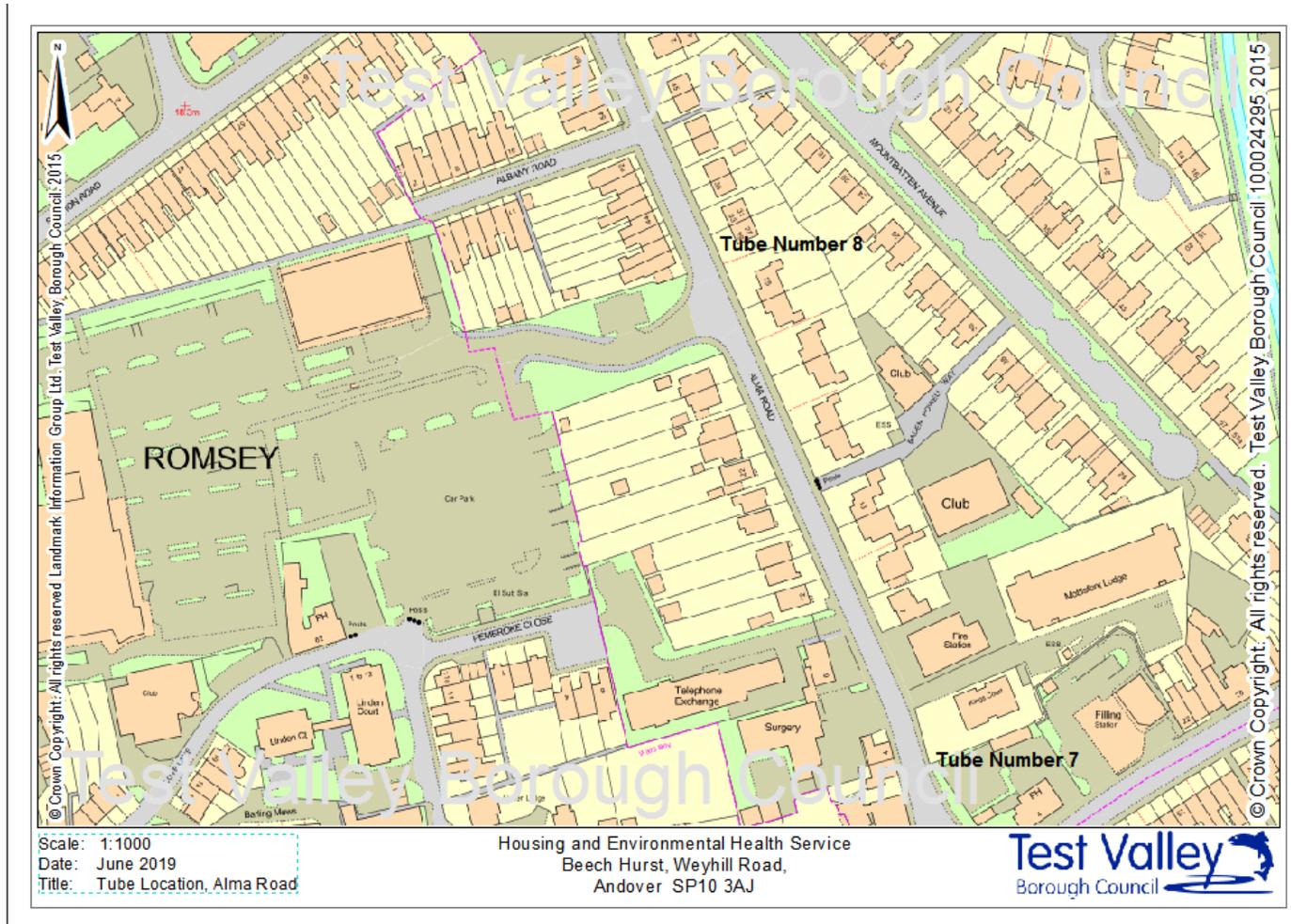
## Appendix D: Map(s) of Monitoring Locations

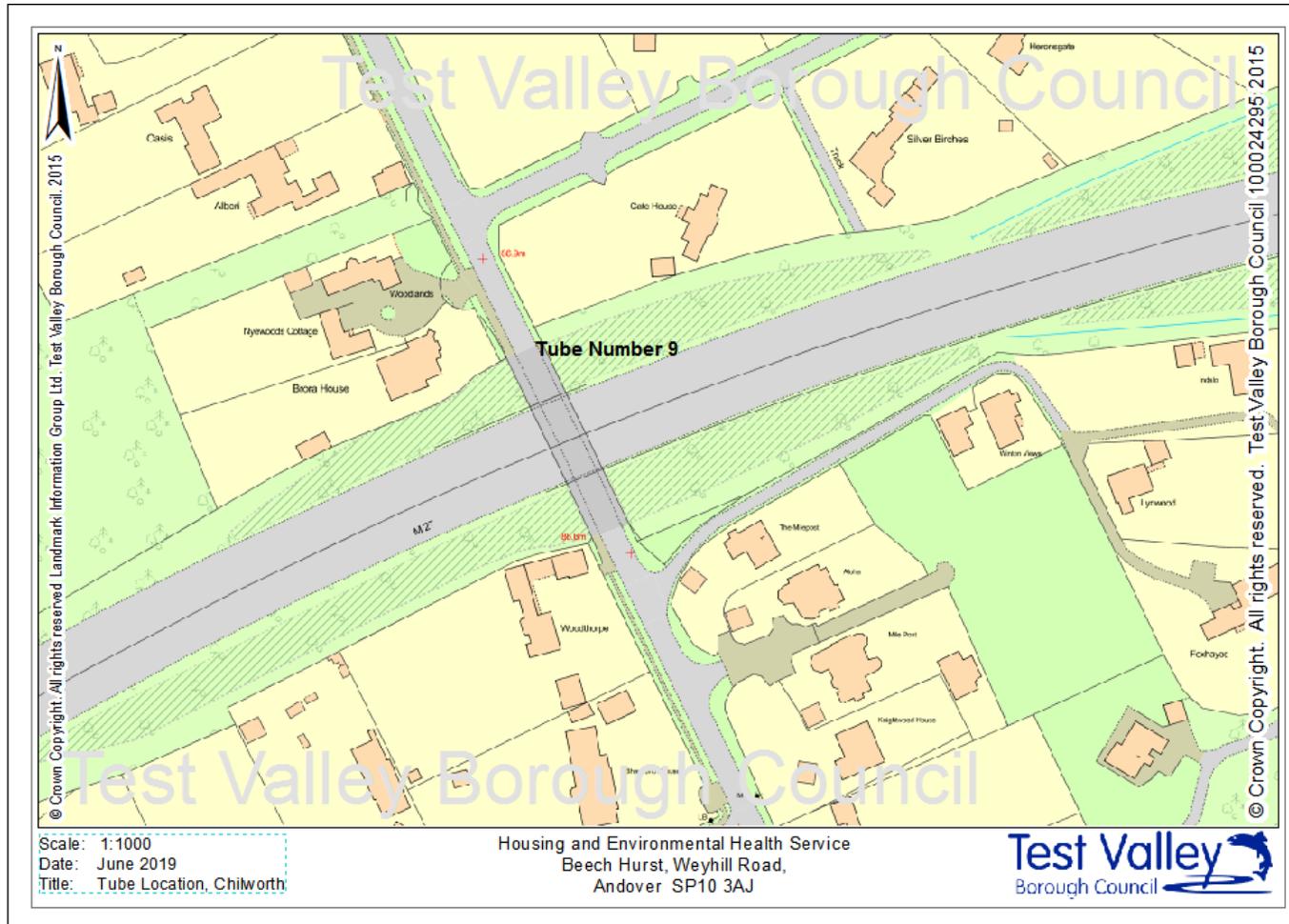
Figure D.1 – Map of Non-Automatic Monitoring Site

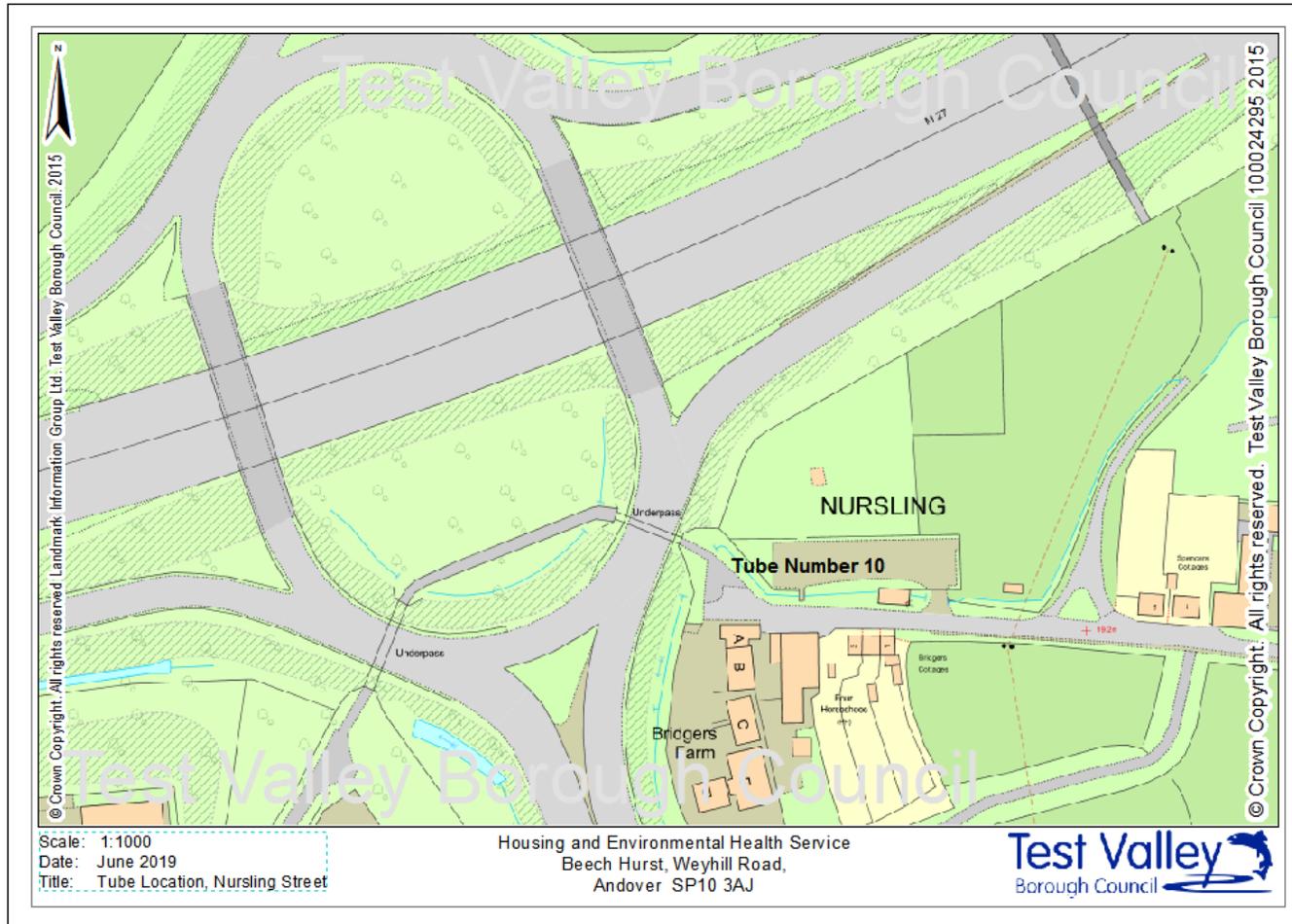


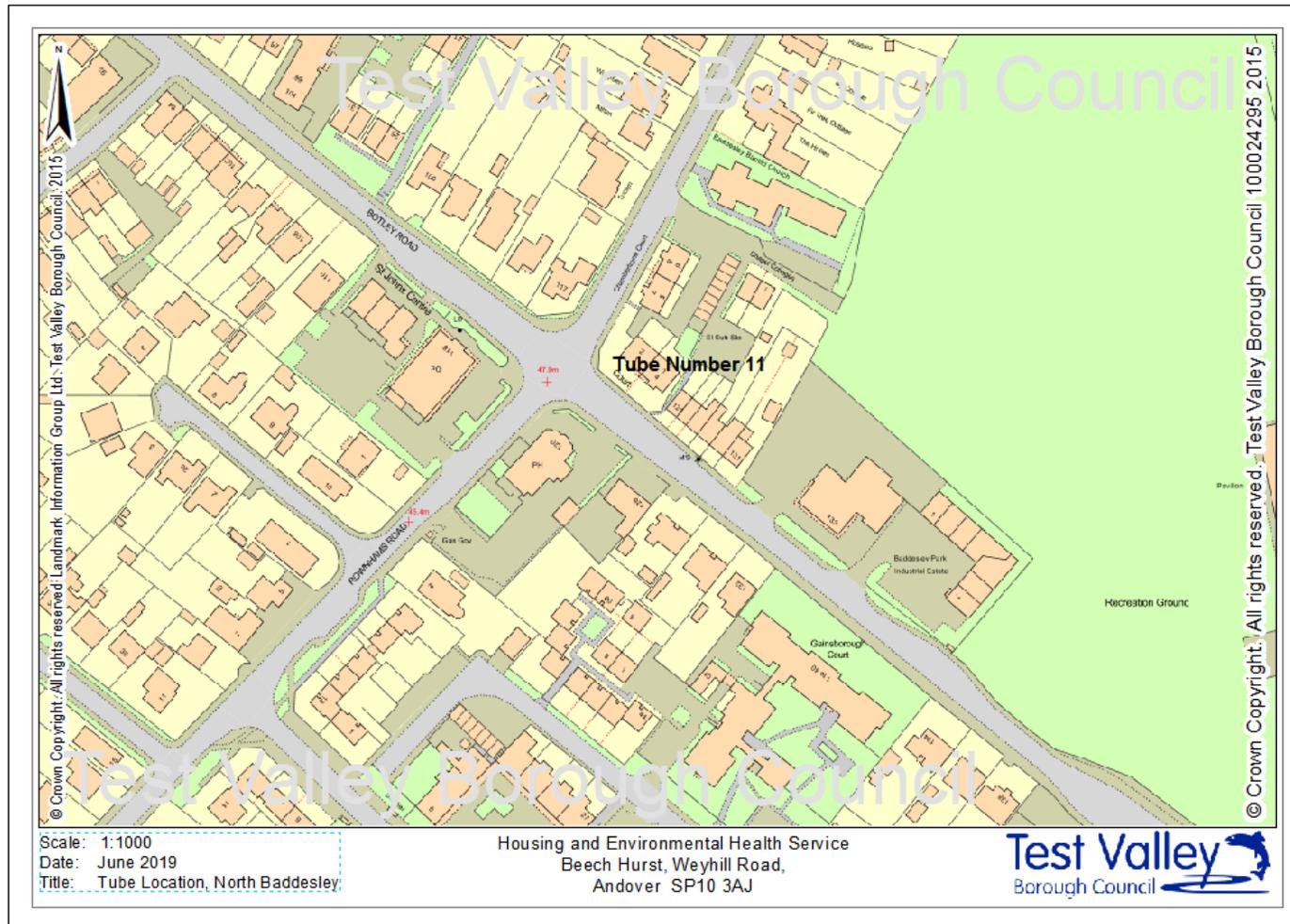


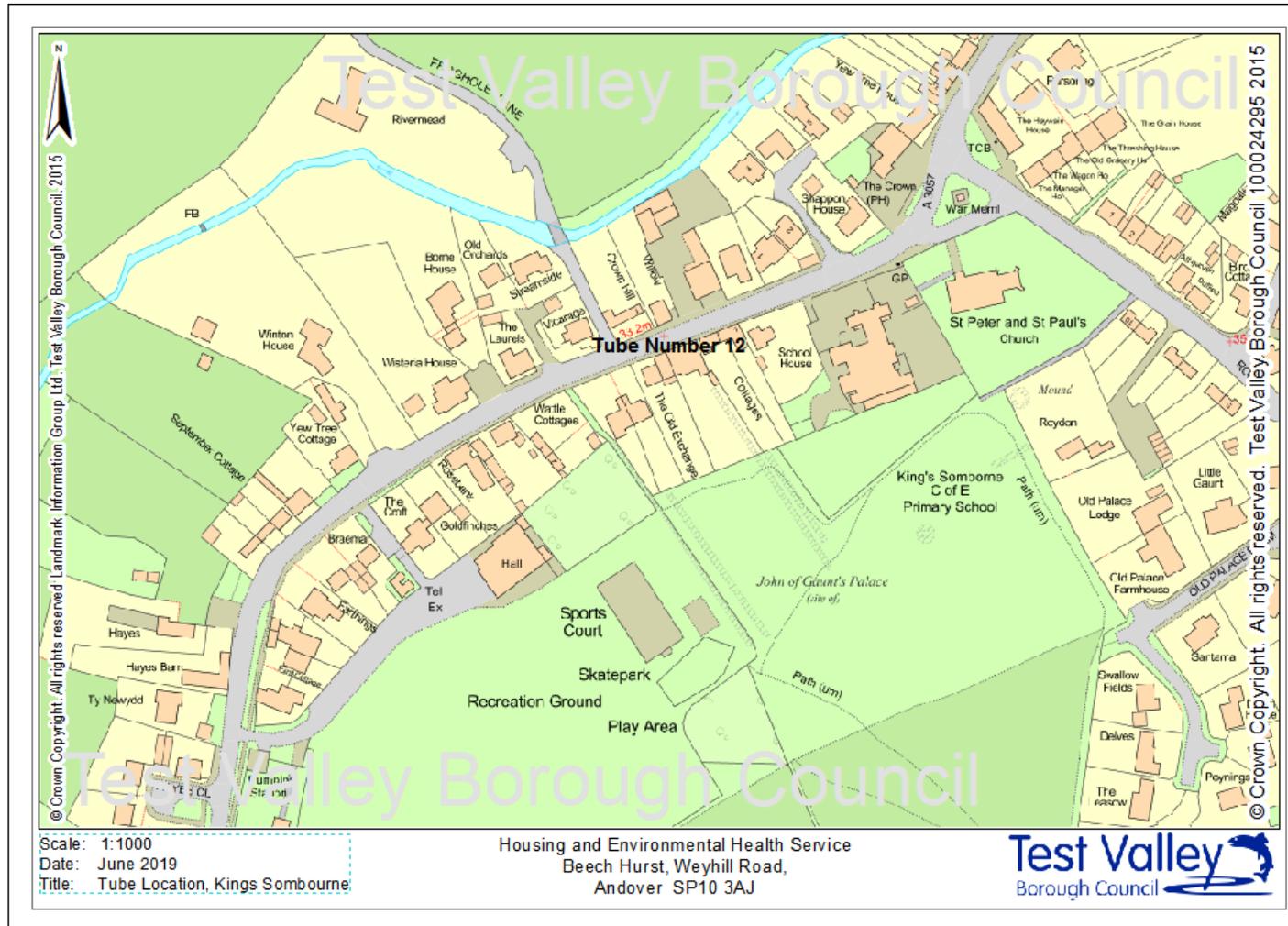


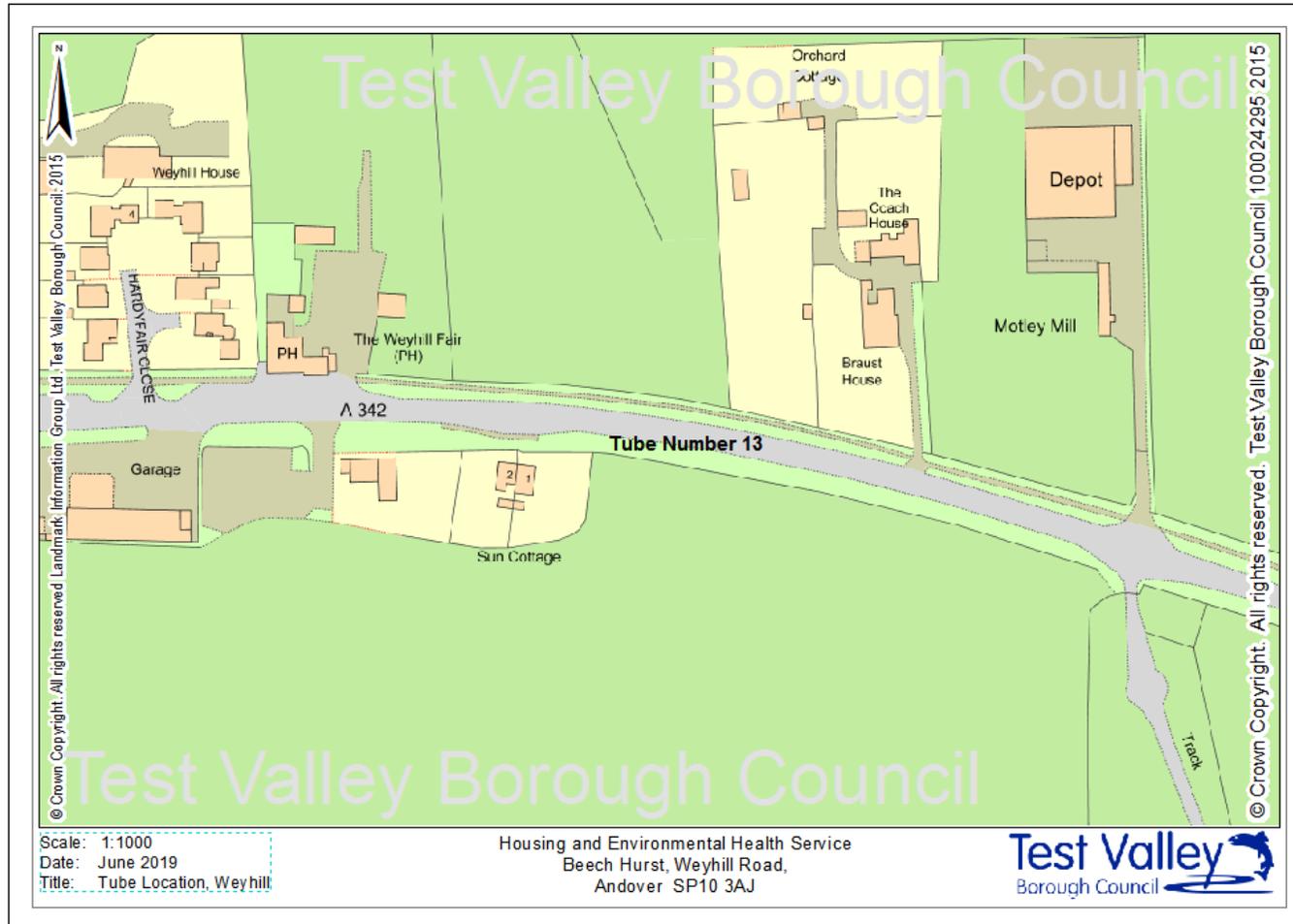


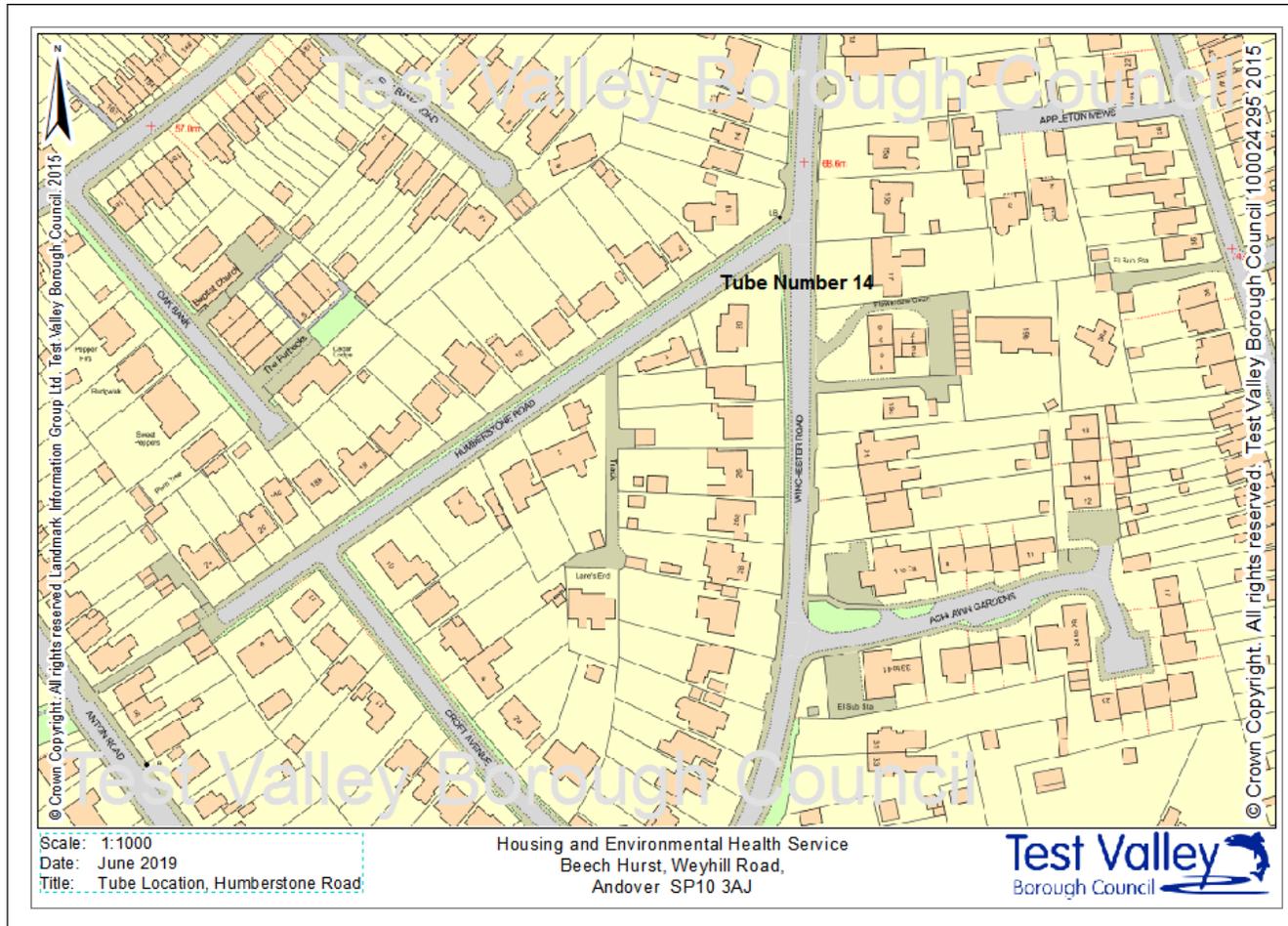


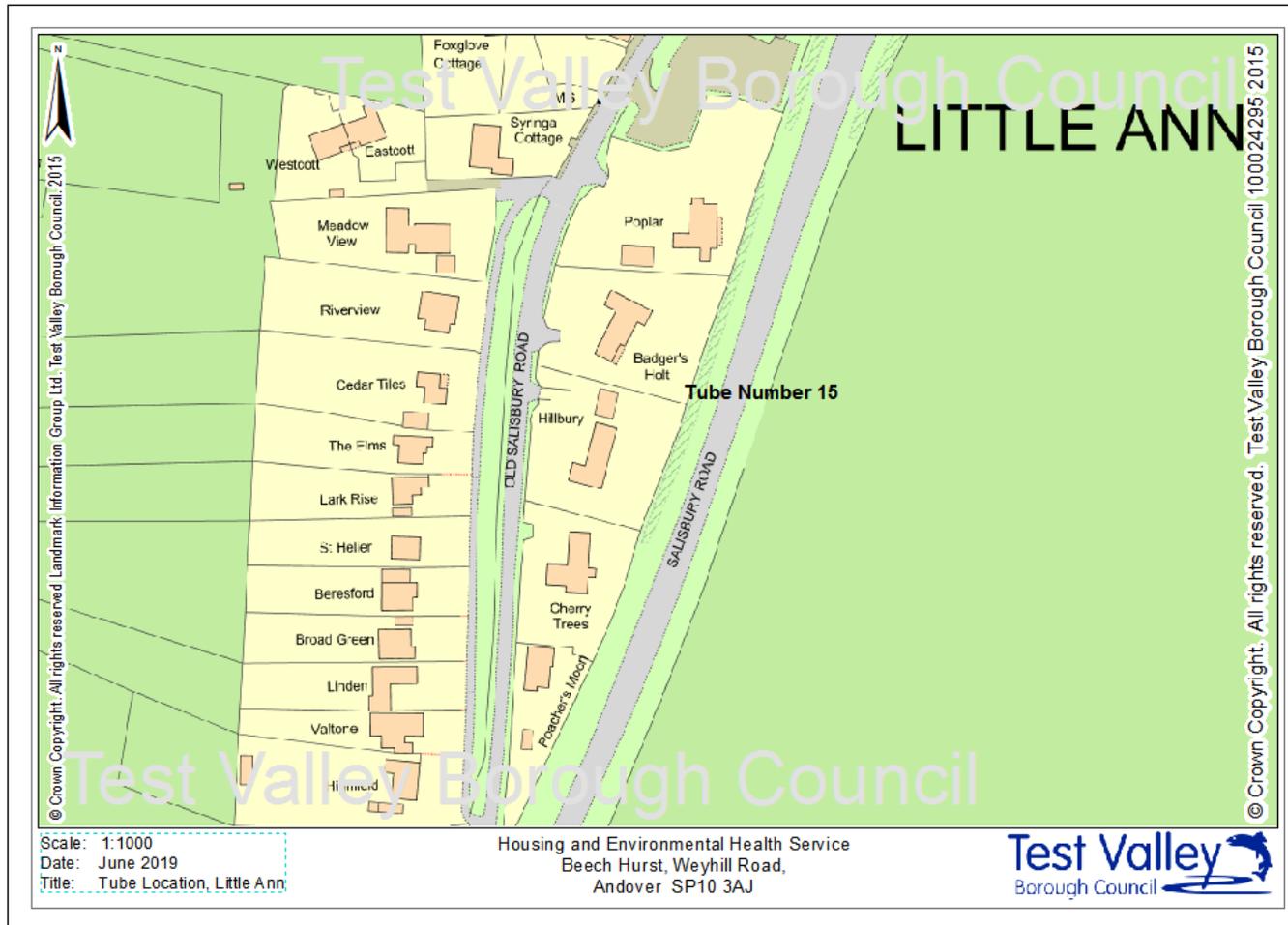


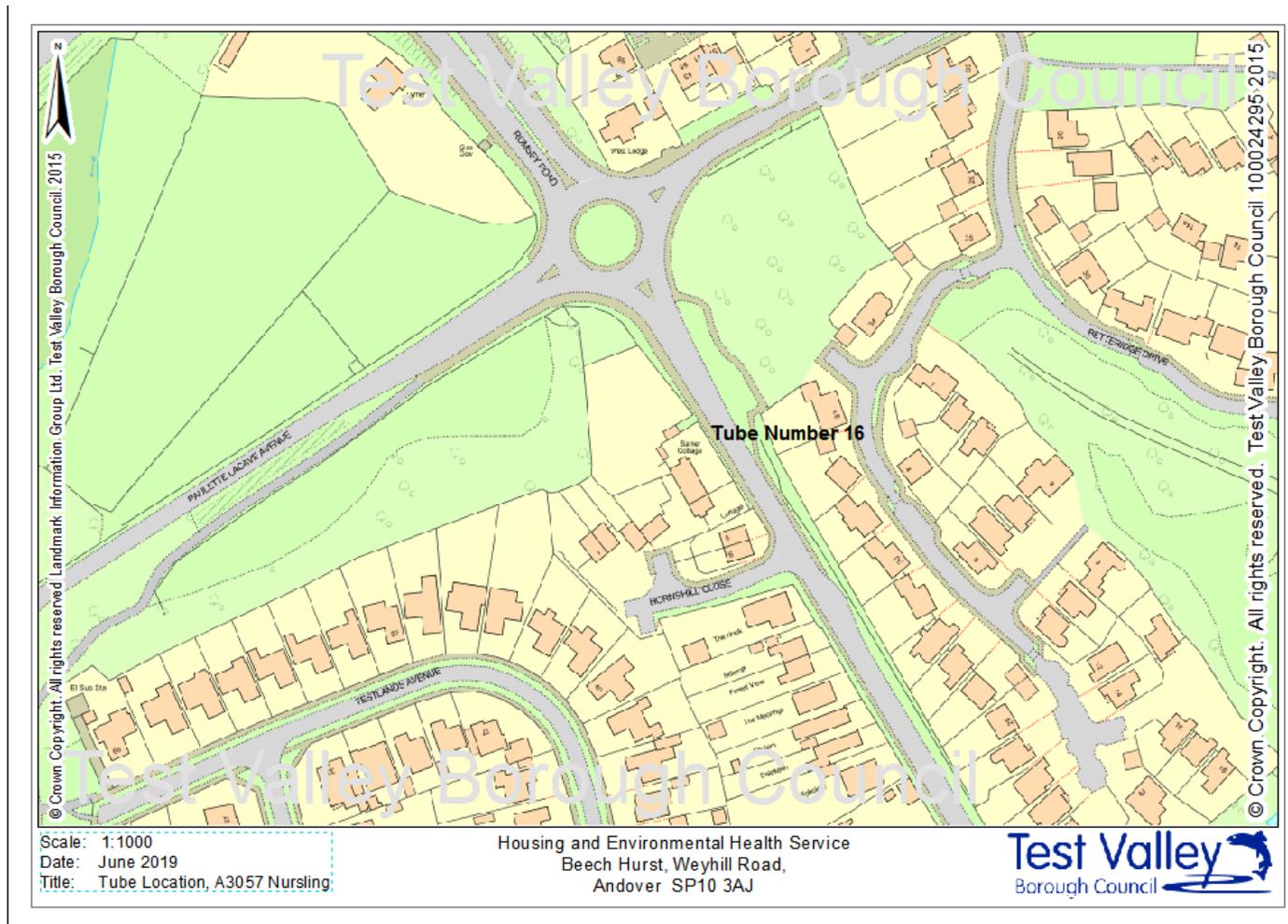


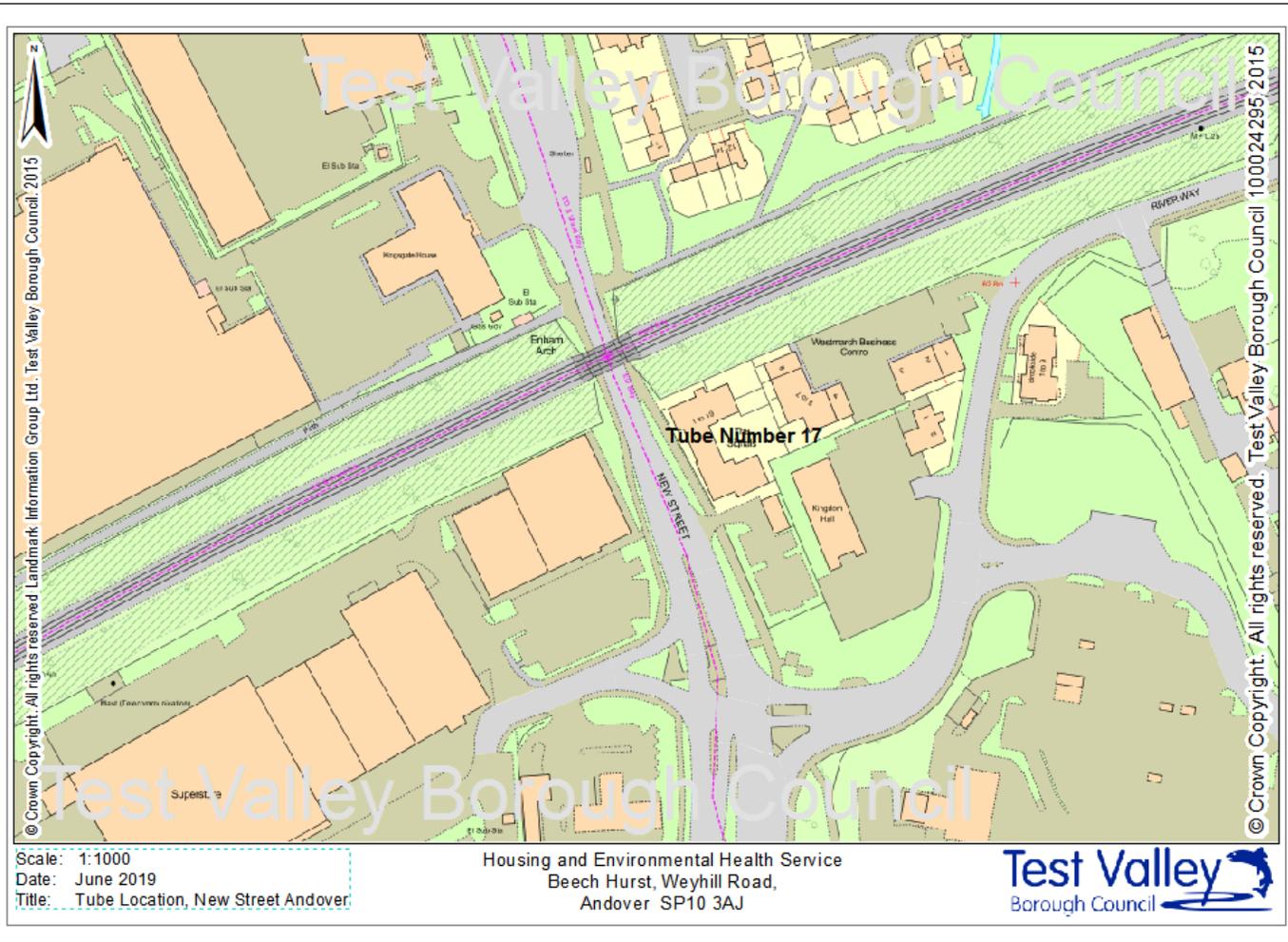












## Appendix E: Summary of Air Quality Objectives in England

Table E.1 – Air Quality Objectives in England<sup>7</sup>

Pollutant	Air Quality Objective: Concentration	Air Quality Objective: Measured as
Nitrogen Dioxide (NO <sub>2</sub> )	200µg/m <sup>3</sup> not to be exceeded more than 18 times a year	1-hour mean
Nitrogen Dioxide (NO <sub>2</sub> )	40µg/m <sup>3</sup>	Annual mean
Particulate Matter (PM <sub>10</sub> )	50µg/m <sup>3</sup> , not to be exceeded more than 35 times a year	24-hour mean
Particulate Matter (PM <sub>10</sub> )	40µg/m <sup>3</sup>	Annual mean
Sulphur Dioxide (SO <sub>2</sub> )	350µg/m <sup>3</sup> , not to be exceeded more than 24 times a year	1-hour mean
Sulphur Dioxide (SO <sub>2</sub> )	125µg/m <sup>3</sup> , not to be exceeded more than 3 times a year	24-hour mean
Sulphur Dioxide (SO <sub>2</sub> )	266µg/m <sup>3</sup> , not to be exceeded more than 35 times a year	15-minute mean

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<sup>7</sup> The units are in microgrammes of pollutant per cubic metre of air (µg/m<sup>3</sup>).

## Appendix F: Impact of COVID-19 upon LAQM

COVID-19 has had a significant impact on society. Inevitably, COVID-19 has also had an impact on the environment, with implications to air quality at local, regional and national scales.

COVID-19 has presented various challenges for Local Authorities with respect to undertaking their statutory LAQM duties in the 2021 reporting year. Recognising this, Defra provided various advice updates throughout 2020 to English authorities, particularly concerning the potential disruption to air quality monitoring programmes, implementation of Air Quality Action Plans (AQAPs) and LAQM statutory reporting requirements. Defra has also issued supplementary guidance for LAQM reporting in 2021 to assist local authorities in preparing their 2021 ASR. Where applicable, this advice has been followed.

Despite the challenges that the pandemic has given rise to, the events of 2020 have also provided Local Authorities with an opportunity to quantify the air quality impacts associated with wide-scale and extreme intervention, most notably in relation to emissions of air pollutants arising from road traffic. The vast majority (>95%) of AQMAs declared within the UK are related to road traffic emissions, where attainment of the annual mean objective for nitrogen dioxide (NO<sub>2</sub>) is considered unlikely. On 23rd March 2020, the UK Government released official guidance advising all members of public to stay at home, with work-related travel only permitted when absolutely necessary. During this initial national lockdown (and to a lesser extent other national and regional lockdowns that followed), marked reductions in vehicle traffic were observed; Department for Transport (DfT) data<sup>8</sup> suggests reductions in vehicle traffic of up to 70% were experienced across the UK by mid-April, relative to pre COVID-19 levels.

This reduction in travel in turn gave rise to a change of air pollutant emissions associated with road traffic, i.e. nitrous oxides (NO<sub>x</sub>), and exhaust and non-exhaust particulates (PM). The Air Quality Expert Group (AQEG)<sup>9</sup> has estimated that during the initial lockdown period in 2020, within urbanised areas of the UK reductions in NO<sub>2</sub> annual mean

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<sup>8</sup> Prime Minister's Office, COVID-19 briefing on the 31<sup>st</sup> of May 2020

<sup>9</sup> Air Quality Expert Group, Estimation of changes in air pollution emissions, concentrations and exposure during the COVID-19 outbreak in the UK, June 2020

concentrations were between 20 and 30% relative to pre-pandemic levels, which represents an absolute reduction of between 10 to 20 $\mu\text{g}/\text{m}^3$  if expressed relative to annual mean averages. During this period, changes in  $\text{PM}_{2.5}$  concentrations were less marked than those of  $\text{NO}_2$ .  $\text{PM}_{2.5}$  concentrations are affected by both local sources and the transport of pollution from wider regions, often from well beyond the UK. Through analysis of AURN monitoring data for 2018-2020, AQEG have detailed that  $\text{PM}_{2.5}$  concentrations during the initial lockdown period are of the order 2 to 5 $\mu\text{g}/\text{m}^3$  lower relative to those that would be expected under business-as-usual conditions.

As restrictions are gradually lifted, the challenge is to understand how these air quality improvements can benefit the long-term health of the population.

## **Impacts of COVID-19 on Air Quality within Test Valley Borough Council**

As can be seen in figure A1 there is a clear decrease in our  $\text{NO}_2$  measurements this year which we anticipate is directly related to the decrease in traffic as a result of home working and limited travel options. Our own offices saw an 84% drop in occupancy in 2020 with associated avoided commuting journeys and other work related travel.

## **Opportunities Presented by COVID-19 upon LAQM within Test Valley Borough Council**

The Environmental Health Team drew attention to online information highlighting that bonfires can impact on respiratory health and waste should be disposed of appropriately. The concerns about the impact of Covid on those with existing respiratory illness or weakness gave this message greater relevance.

Our area is predominantly rural so our Communications Team took the opportunity to encourage people to get out and walk by posting walking and cycling routes on social media and sharing information on local nature reserves.

The Communities and Leisure Service re-publicised our existing health walks scheme.

## Challenges and Constraints Imposed by COVID-19 upon LAQM within Test Valley Borough Council

During 2020 it was not possible to maintain diffusion tube exposure periods for March to June in line with the national monitoring calendar. We have a small team which was impacted early in March by a pre-lockdown isolation and ill health, the team was subsequently short staffed throughout 2020 and facing other challenges as well. This has affected data capture within 2020, resulting in monitoring sites having to be annualised.

**Small Impact** – Data Capture, **Medium Impact** - Adherence to Changeover Dates.

The impacts as presented above are aligned with the criteria as defined in Table F 1, with professional judgement considered as part of their application.

**Table F 1 – Impact Matrix**

Category	Impact Rating: None	Impact Rating: Small	Impact Rating: Medium	Impact Rating: Large
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.TG16	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 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
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

## Glossary of Terms

Abbreviation	Description
AQAP	Air Quality Action Plan - A detailed description of measures, outcomes, achievement dates and implementation methods, showing how the local authority intends to achieve air quality limit values'
AQMA	Air Quality Management Area – An area where air pollutant concentrations exceed / are likely to exceed the relevant air quality objectives. AQMAs are declared for specific pollutants and objectives
ASR	Annual Status Report
Defra	Department for Environment, Food and Rural Affairs
DMRB	Design Manual for Roads and Bridges – Air quality screening tool produced by Highways England
EU	European Union
FDMS	Filter Dynamics Measurement System
LAQM	Local Air Quality Management
NO <sub>2</sub>	Nitrogen Dioxide
NO <sub>x</sub>	Nitrogen Oxides
PM <sub>10</sub>	Airborne particulate matter with an aerodynamic diameter of 10µm or less
PM <sub>2.5</sub>	Airborne particulate matter with an aerodynamic diameter of 2.5µm or less
QA/QC	Quality Assurance and Quality Control
SO <sub>2</sub>	Sulphur Dioxide

## References

- Local Air Quality Management Technical Guidance LAQM.TG16. April 2021. Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland.
- Local Air Quality Management Policy Guidance LAQM.PG16. May 2016. Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland.