181 Union Street, Aberdeen (200474/DPP)
Air Quality Assessment

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Air Quality Assessment

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Author:	Bryan Cassidy
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Glasgow

Craighall Business Park
8 Eagle Street
Glasgow
G4 9XA
0141 341 5040
info@envirocentre.co.uk
www.envirocentre.co.uk

Aberdeen

Banchory Business Centre
Burn O'Bennie Road
Banchory
AB31 5ZU
01330 826 596

Inverness

Alder House
Cradlehall Business Park
Inverness
IV2 5GH
01463 794 212

Edinburgh

1st Floor
Sirius Building
The Clocktower Estate
South Gyle Crescent
Edinburgh
EH12 9LB
0131 370 4070

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EXECUTIVE SUMMARY

EnviroCentre Ltd has been commissioned by Sava Estates to undertake an Air Quality Assessment to support a planning application for the conversion of a property at 181 Union Street, Aberdeen into residential apartments.

Union Street forms part of the Aberdeen City Centre Air Quality Management Area (AQMA) which has been declared due to measured exceedances of the relevant Air Quality Objective levels for Nitrogen Dioxide (NO_2) and Particulate Matter (PM_{10}). The primary long-term concern in relation to air quality is the potential to expose future residents of the development to pollutant concentrations greater than the relevant objective levels.

As such an ADMS-Roads model was utilised to assess the potential for National Air Quality Objectives to be exceeded across the Union Street façade of the development. Should exceedances be determined, additional forms of ventilation to replace open windows (such as mechanical ventilation) would be required to mitigate exposure, with a fresh air intake system providing air from another source.

Consultation was carried out with Aberdeen City Council Environmental Health in August 2020 during which the scope and methodology of the assessment was confirmed.

The model predicts that no residents will be exposed to concentrations above relevant objective levels and consequently there will be **no requirement for additional ventilation** at any of the Union Street facing windows.

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1 INTRODUCTION

1.1 Terms of Reference

EnviroCentre Ltd have been commissioned by Sava Estates to undertake an Air Quality Assessment in support of a planning application for the redevelopment of a property at 181 Union Street, Aberdeen: refer to Drawing No. 373949-001, Appendix A for site location.

1.2 Report Usage

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2 LEGILSATION & GUIDANCE

2.1 Legislative Background

Air quality in the UK is protected by national and regional legislation. In the UK, Part IV of the Environment Act 1995 places a statutory duty on local authorities to periodically review and assess the air quality within their area. This involves consideration of present and likely future air quality against air quality standards and objectives. Guidelines on the "Review and Assessment" process of local air quality were published in the 1997 National Air Quality Strategy (NAQS) and associated guidance and technical guidance. In 2000, the Government reviewed the 1997 Strategy and produced a revised Air Quality Strategy for England, Scotland, Wales and Northern Ireland, which resulted in the production of air quality standards and objectives. The most current revision of the Strategy available is dated March 2011 (DEFRA, 2011).

The objectives adopted in Scotland are contained within the Air Quality (Scotland) Regulations 2000 and Air Quality (Scotland) Amendment Regulations 2002 for the purpose of Local Air Quality Management and consolidate the provisions of the previous Air Quality Regulations. The Air Quality Standards (Scotland) Regulations 2010 introduce objectives for Particles (PM_{10}, $PM_{2.5}$), Polycyclic Aromatic Hydrocarbons and lead with the Air Quality (Scotland) Amendment Regulations 2016 amending the Air Quality (Scotland) Regulations 2000 to bring into statute an objective for $PM_{2.5}$.

2.2 Air Quality Standards and Objectives

2.2.1 Air Quality Definitions

Standards for air pollution are concentrations over a given time period that are considered to be acceptable in light of what is known about the effects of each pollutant on health and on the environment. They can also be used as a benchmark to see if air pollution is getting better or worse.

An exceedance of a standard is a period of time (which is defined in each standard) where the concentration is higher than that set down by the standard. In order to make useful comparisons between pollutants, for which the standards may be expressed in terms of different averaging times, the number of days on which an exceedance has been recorded is often reported

2.2.2 National Air Quality Objectives

Table 2-1 provides a summary of the air quality objectives from the Air Quality (Scotland) Regulations 2000, as amended 2016. An objective is the target date on which exceedances of a standard must not exceed a specified number. The results of air quality modelling will be compared against these objectives.

Table 2-1: Summary of Objectives of the UK Air Quality Strategy

Pollutant	Objective	Measured as	To be achieved by
Benzene (All Authorities)	16.25 µg/m^3	Running Annual Mean	31 December 2003
Benzene (Scotland and Northern Ireland Only)	3.25 µg/m^3	Running Annual Mean	31 December 2010
1,3 Butadiene	2.25 µg/m^3	Running Annual Mean	31 December 2003
Carbon Monoxide (Authorities in Scotland Only)	10.0 µg/m^3	Running 8-Hour Mean	31 December 2003
Lead	0.5 µg/m^3	Annual Mean	31 December 2004
	0.25 µg/m^3	Annual Mean	31 December 2008
Nitrogen Dioxide	200 µg/m^3 Not to be exceeded more than 18 times per year	1 Hour Mean	31 December 2005
	40 µg/m^3	Annual Mean	31 December 2005
Particles (PM_{10}) (gravimetric) All authorities	50 µg/m^3 Not to be exceeded more than 35 times per year	24 Hour Mean	31 December 2004
	40 µg/m^3	Annual Mean	31 December 2004
Particles (PM_{10}) (gravimetric) Scotland Only	50 µg/m^3 Not to be exceeded more than 7 times per year	24 Hour Mean	31 December 2010
	18 µg/m^3	Annual Mean	31 December 2010
Particles ($PM_{2.5}$) (gravimetric) All authorities	25 µg/m^3 (target)	Annual Mean	2020
	15% cut in urban background exposure	Annual Mean	2010 – 2020
Particles ($PM_{2.5}$) (gravimetric) Scotland Only	10 µg/m^3 (Limit)	Annual Mean	2020
Sulphur Dioxide	350 µg/m^3 not to be exceeded more than 24 times a year	1-Hour Mean	31 December 2004
	125 µg/m^{3}not to be exceeded more than 3 times a year	24 Hour Mean	31 December 2004
	266 µg/m^3 not to be exceeded more than 35 times a year	15-Minute Mean	31 December 2005
PAH *	0.25 ng/m^3	Annual Mean	31 December 2010
Ozone *	100 µg/m^3	8 hourly running or hourly mean *	31 December 2005
* not currently assessed by Scottish Local Authorities			

2.2.3 Air Quality Guidance

LAQM.TG16 and LAQM.PG16

Technical Guidance (LAQM.TG(09)) was issued on behalf of the Department of Environment, Food and Rural Affairs (DEFRA) in February 2009 (DEFRA, 2009a). A Policy Guidance (LAQM.PG09) was also issued at the same time (DEFRA, 2009b). This guidance is designed to guide local authorities through the Review and Assessment process and will also be adhered to for the purpose of the air quality assessment.

DEFRA and The Scottish Government have recently updated LAQM Technical Guidance (LAQM.TG16) (The Scottish Government, 2018). The main change is in the approach with a greater emphasis on action planning to bring forward improvements in air quality and to include local measures as part of EU reporting requirements. The reporting requirements for Local Authorities also changed with the adoption of an Annual Progress Report. Local Authorities continue to appraise pollutant concentrations of Nitrogen Dioxide (NO_2), Particulate Matter (PM_{10}) and Sulphur Dioxide (SO_2). Local Authorities are also required to work towards reducing levels of $PM_{2.5}$.

2.2.4 Air Quality Management Area

The process of review and assessment has raised the profile of air quality assessment as a material planning consideration in development-related projects. For example, where it is known through the review and assessment process that problems in the achievement of air quality standards and objectives exist, the declaration of an Air Quality Management Area (AQMA) can conflict with permissions to develop. That is, the local authority is under a duty to improve air quality within an AQMA due to further breaches of air quality standards and objectives.

Aberdeen City Council have declared three AQMA's within their boundary area as follows:-

- City Centre;
- Anderson Drive; and
- Wellington Road.

All three of these AQMA's have been declared due to measured exceedances of the National Air Quality Objectives for Nitrogen Dioxide (NO_2) and Particulate Matter (PM_{10}).

The proposed development is located within the City Centre AQMA.

3 DESCRIPTION & POTENTIAL IMPACTS

3.1 Site Location & Proposed Development

The site, located at 181 Union Street, Aberdeen is currently utilised as offices on the basement, first, second and third floors with a bookmakers and vacant shop unit taking up the ground floor.

The proposal would see the offices on the basement level converted to provide 17 parking spaces with the first, second and third floor offices converted into residential apartments. The ground floor use would remain as non-residential.

3.2 Air Quality Impacts

Union Street forms part of the Aberdeen City Centre Air Quality Management Area (AQMA) which has been declared due to measured exceedances of the relevant Air Quality Objective levels for Nitrogen Dioxide (NO_2) and Particulate Matter (PM_{10}). The primary long-term concern in relation to air quality is therefore the potential for future residents being exposed to high levels of pollutant concentrations through opening of apartment windows which face onto Union Street. The assessment will determine if there is a requirement for additional forms of ventilation to replace open windows (such as mechanical ventilation) in order to mitigate exposure to these pollutants.

3.3 Consultation

Consultation was carried out with Aberdeen City Council Environmental Health in August 2020 during which the scope and methodology of the assessment was agreed. The following considerations were requested and included within the assessment.

- Traffic data for the year 2018 would be obtained for automatic counter No.1042 on Union Street from the DfT website and projected forward to 2019 to allow for verification against the most recent monitoring data available using a 'Central' NRTF Growth Factor of 1.2%. The data was then projected to the year of development opening (2021) using a 'Central' NRTF Growth Factor of 2.4%. Factors were obtained from the NRTF factors workbook;
- Assessment of impact for the year of development opening should include contributions from traffic generated by additional developments within the Aberdeen City Centre AQMA. Full details are provided in Section 4.4;
- As the development will introduce only 17 parking spaces, it was agreed that consideration of the impact of development generated traffic would be negligible and was therefore discounted from the assessment;
- Inclusion of Sensitive Receptors across the Union Street façade of the development corresponding to individual windows on each floor of the property and positioned at heights corresponding to the point of opening for each window. Full details are provided in section 4.2;
- Verification of the ADMS-model against 2019 measured concentrations of NO_2, PM_{10} and $PM_{2.5}$ at automatic monitoring station CM2, located at 226 Union Street within the City Centre AQMA;
- Utilisation of meteorological data from Dyce weather station for the year 2019; and
- Background NO_2, PM_{10}, $PM_{2.5}$ and ozone concentrations were obtained from the Errol Place urban background automatic monitor for the year 2019.

4 ADMS-ROADS DISPERSION MODELLING

The ADMS Roads dispersion model is approved for use in detailed assessment dispersion modelling in technical guidance LAQM.TG16 (DEFRA, 2016). The model has been subject to extensive validation and inter-model comparison studies.

4.1 Assessed Years & Scenarios

The air dispersion modelling exercise considered the impact on future residents within the development and the possible requirement for mechanical ventilation in order to limit exposure of pollutant concentrations above national air quality targets coming into apartments through open windows which face on to Union Street.

The following assessment scenarios were considered:

- 2019 Baseline (for model verification only); and
- 2021 Baseline + Committed Developments.

Full details of committed developments included within the model are outlined in Section 4.4.

4.2 Sensitive Receptors

The sensitive receptors used in the model were selected to provide details on pollutant concentrations at the windows of the apartments of the proposed development which face on to Union Street. The receptors therefore correspond to windows on the first, second and third floors of the development at height of 6, 10 and 14m respectively.

The location of each receptor along with the considered road network was input to the air dispersion model using the GIS software ArcMap 10.7 on a digital OS tile of the surrounding area. The sensitive receptors assessed within the model are listed in Table 4-1 below and shown in Drawing No. 373949-001, Appendix A.

Table 4-1: Air Quality Sensitive Receptors

Receptor ID	Receptor Description
SR1	Receptor 1 - Modelled at Heights of 6, 10 & 14m
SR2	Receptor 2 – Modelled at Heights of 6, 10 & 14m

4.3 Modelled Roads

For local impact assessments the roads included in the calculations should be all those expected to make a significant contribution to pollution at the receptor locations in question. In practise, roads more than 200m away from the receptor can be excluded. Minor roads can also be excluded even when they are closer than 200m to receptors due to their relatively small pollutant contributions. No industrial sources were modelled.

The only road link included within the assessment was Union Street itself. Counts were obtained from the Department for Transport website for Automatic Traffic Counter (ATC) No. 1042, which is located in Union Street approximately 750m west of the proposed development site.

The traffic information obtained by EnviroCentre from the DfT website consisted of Annual Average Daily Traffic (AADT) flows which were then divided by 24 to provide traffic flows per hour, as required by the ADMS-Roads model. The traffic figures from DfT also included values for Light Duty Vehicles (LDV) <3.5t and Heavy Duty Vehicles (HDV) >3.5t.

The obtained data was projected forward to 2019 to allow for verification against the most recent monitoring data available using a 'Central' NRTF Growth Factor of 1.2%. The data was then projected to the year of development opening (2021) using a 'Central' NRTF Growth Factor of 2.4%;

The width of the road (calculated using ArcMap 10.7) and all other road input data can be found in Appendix B. The Traffic Distribution by time of day on all roads: 2018 table in the National Statistics of the Department For Transport (2019) Statistics Bulletin was also used to derive a diurnal variation pattern for all the roads considered in the assessment, see Table 4-2.

Full details of the traffic data included in the model can be found in Appendix B.

Table 4-2: Diurnal Time Varying Emission Factors

Local Time (Hrs)	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
00:00 – 01:00	0.16	0.15	0.16	0.17	0.19	0.25	0.27
01:00 – 02:00	0.10	0.11	0.12	0.12	0.13	0.17	0.17
02:00 – 03:00	0.09	0.10	0.10	0.11	0.12	0.13	0.12
03:00 – 04:00	0.11	0.12	0.12	0.12	0.13	0.13	0.11
04:00 – 05:00	0.21	0.19	0.19	0.20	0.20	0.15	0.11
05:00 – 06:00	0.55	0.49	0.49	0.48	0.46	0.25	0.16
06:00 – 07:00	1.20	1.18	1.16	1.15	1.06	0.42	0.26
07:00 – 08:00	1.83	1.86	1.84	1.83	1.69	0.67	0.39
08:00 – 09:00	1.82	1.86	1.85	1.84	1.71	0.99	0.57
09:00 – 10:00	1.50	1.53	1.54	1.54	1.48	1.30	0.93
10:00 – 11:00	1.44	1.40	1.41	1.43	1.53	1.56	1.31
11:00 – 12:00	1.47	1.40	1.43	1.46	1.63	1.70	1.53
12:00 – 13:00	1.49	1.43	1.46	1.50	1.72	1.70	1.61
13:00 – 14:00	1.49	1.46	1.49	1.54	1.77	1.62	1.57
14:00 – 15:00	1.56	1.56	1.60	1.64	1.84	1.52	1.52
15:00 – 16:00	1.70	1.74	1.77	1.80	1.94	1.44	1.51
16:00 – 17:00	1.92	1.98	2.00	2.00	2.01	1.42	1.51
17:00 – 18:00	1.91	1.98	1.99	1.99	1.92	1.37	1.39
18:00 – 19:00	1.45	1.55	1.58	1.61	1.59	1.18	1.21
19:00 – 20:00	0.97	1.03	1.08	1.15	1.21	0.91	1.02
20:00 – 21:00	0.68	0.72	0.76	0.82	0.87	0.68	0.80
21:00 – 22:00	0.51	0.55	0.57	0.62	0.64	0.53	0.58
22:00 – 23:00	0.37	0.42	0.44	0.46	0.51	0.46	0.40
23:00 – 00:00	0.23	0.26	0.27	0.30	0.37	0.37	0.25

4.4 Committed Developments

Following consultation with Aberdeen City Council Environmental Health, it was agreed that assessment of impact for the year of development opening should include contributions from traffic generated by additional development within the Aberdeen City Centre AQMA. In the case of committed developments scheduled to open after the proposed development, predicted flow increases would be included in order to present a conservative assessment. The developments requested to be considered in the assessment as follows:

- Union Square Shopping Centre extension (Planning Ref 152005);
- Merchant Building redevelopment (Planning Ref 190312/DPP);
- Bon Accord Centre expansion / mixed use development (Planning Ref. 170353/PPP);
- Woolmanhill hospital conversion (Planning Ref 160801/DPP); and
- Union Terrace Gardens redevelopment (Planning Ref 170497/DPP);

An air quality assessment was completed for the Union Square Shopping Centre extension in 2015, including traffic projections for Aberdeen City Centre from 2014 to 2017 both with and without the development. These traffic projections predicted a significant loss of flow on Union Street for both scenarios due to various traffic control measures being introduced in that time. Aberdeen City Council granted Planning Permission in Principle in which it is stated that "Car parking has been limited to a level such that there should be 'no additional trips generated on the local road network'". Therefore, there are no additional flows included in this assessment attributed to this development.

The Merchant Building redevelopment has also had an air quality assessment completed, including a transport assessment which considers the following scenarios: 2017 baseline, 2022 without development, and 2022 with development. Using this approach, an additional 759 AADT flow has been included on Union Street.

In the cases of the Bon Accord Centre expansion and the Woolmanhill hospital conversion, the respective transport assessments/statements did not consider Union Street. To date there has been no transport assessment completed for the Union Terrace Gardens redevelopment, therefore no additional AADT flows have been attributed to these developments and consequently these developments are not considered further within the assessment. This approach to the committed traffic developments to be included in this air quality assessment was agreed with Aberdeen City Council during consultation.

4.5 Background Air Quality

As agreed through consultation, background air quality concentrations were obtained from Aberdeen City Council urban background air quality automatic monitor, which is located on Errol Place. The measured background pollutant concentrations for 2019 are outlined in Table 4-3 below:

Table 4-3: Monitored 2019 Urban Background Concentrations – Errol Place

ID	Site Name	Site Type	OS Grid Reference	2019 Annual Mean NO_2 Concentration (µg/m3)	2019 Annual Mean PM_{10} Concentration (µg/m3)	2019 Annual Mean $PM_{2.5}$ Concentration (µg/m3)
CM1	Errol Place	Urban Background	394397, 807392	17	14	7

In order to ensure a conservative assessment no improvement in background pollutant concentrations was assumed between the 2019 and 2021 scenarios.

4.6 Measured Results

In order to verify the accuracy of the ADMS-Roads model, measured pollutant concentrations were obtained from Aberdeen City Council's automatic air quality monitor on Union Street. Details of the automatic monitor are provided in Table 4-4 below. The verification process is outlined in Section 5-1.

Table 4-4: Monitored 2019 Annual Average Pollutant Concentrations

ID	Site Name	Site Type	OS Grid Reference	2019 Annual Mean NO_2 Concentration (µg/m3)	2019 Annual Mean PM_{10} Concentration (µg/m3)	2019 Annual Mean $PM_{2.5}$ Concentration (µg/m3)
CM2	226 Union Street	Roadside	393656, 805967	36	12	8

On review of the measured results it is of note that the pollutant concentrations for NO_2, PM_{10} and $PM_{2.5}$ at automatic monitoring station CM2 are all below their respective national Air Quality Objective levels of 40µg/m^3, 18µg/m^3 and 10µg/m^3.

4.7 Weather Conditions

Meteorology data purchased from ADM Ltd specifically for use in ADMS-Roads was used in this assessment. The data was for the year 2019 and was obtained from the nearest meteorological weather station to the site recording a full suite of meteorological parameters, which is located at Dyce, Aberdeen.

This weather station has an altitude of 66m and is located on open ground at Aberdeen Airport approximately 9km north-west of the proposed development site. The data provided by the meteorological station was fully ratified and validated for the year 2019 and included all the meteorological parameters required by the model comprising hourly sequential recordings of:

- Surface temperature;
- Precipitation;
- Wind speed;
- Wind direction;
- Relative humidity; and
- Cloud cover.

The corresponding wind rose for this year is provided in Figure 4-1. It indicates two prominent wind directions of between 170 - 190° and 310 - 320°, with the greatest percentage of wind speed lying between 10-15 knots.

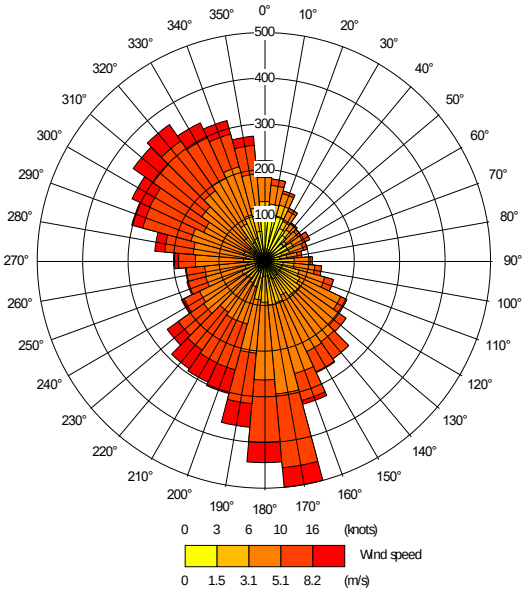

Figure 4-1: Wind rose for 2019 Dyce Weather Station Wind Speed Data

4.8 Additional Input Data

Additional input data was confirmed through a verification process designed to result in a model which most closely represented conditions at the existing monitoring location and therefore gave a conservative indication of the pollutant concentrations the assessed sensitive receptors would be exposed to. The following additional input data were therefore utilised in the model:

The chemical reaction scheme option was utilised in the assessment so that the model took into account photochemical reactions between NO, NO_2 and O_3.

The model was run using the 2019 annual average O_3 concentration for Aberdeen Errol Place. The respective value is 48µg/m^3.

A surface roughness length is used in the dispersion modelling study to characterise the land use of the surrounding area in terms of the frictional effect that will occur due to the interaction of wind with the surface; this is a key component in the generation of atmospheric turbulence, which influences dispersion. A surface roughness length of 1 (representative of cities and woodlands) was used to characterise the proposed development site, whilst a surface roughness length of 0.5 (representative of parkland/open suburbia) was used for the meteorological site.

A minimum Monin-Obukhov length is used in the dispersion model to represent the effects of buoyancy on turbulent flows as a result of surface temperature and mechanical mixing in the lower atmosphere. The minimum Monin-Obukhov length used for both the model and the meteorological site was 30m which is considered representative of cities and large towns.

Both gridded and specified points output were selected in the model so that emissions could be displayed as both contour plots and as values at particular sensitive receptors in the surrounding area. For a full list of the sensitive receptors refer to Section **Error! Reference source not found.**. The annual average concentrations of NO_2, PM_{10} and $PM_{2.5}$ were modelled in this assessment.

5 MODELLED RESULTS

5.1 Model Verification

Verification refers to the process of comparing model predicted concentrations to measured pollutant concentrations. It provides a means of determining how the model is performing and can allow for a reduction in model uncertainty.

The model was verified using the measured NO_2, PM_{10} and $PM_{2.5}$ concentrations detailed in Table 4-4 above.

As atmospheric nitrogen dioxide (NO_2) is produced as a result of reactions of nitric oxide (NO) and ozone it is most appropriate to verify the model for atmospheric NO_x which is a combination of NO and NO_2.

The model was therefore run to predict annual mean road NO_x concentrations at the automatic monitoring site with the resultant NO_2 concentrations then determined by inputting the predicted road NO_x concentration into the DEFRA NO_x to NO_2 calculator.

Table 5-1 below details the percentage difference in the pollutant concentrations measured at the monitoring location CM2 and the concentrations predicted by the ADMS-Roads model.

Table 5-1: Measured & Modelled Concentrations of NO_2, PM_{10} and $PM_{2.5}$ for 2018

Site ID	Site Name	Pollutant	Measured Concentration (µg/m³)	Modelled Concentration (µg/m³)	% Difference [(modelled-measured)/measured]*
CM2	226 Union Street	NO_2	36	38.4	6.72
		PM_{10}	12	15.15	26.3
		$PM_{2.5}$	8	7.74	-3.25

*Note: *Positive numbers indicate an over prediction and negative numbers an under prediction by the model.*

The obtained modelled concentrations for NO_2, and $PM_{2.5}$ were found to be within 10% of measured concentrations at the automatic monitoring site and therefore in accordance with LAQM.TG (16) no adjustment of the model was necessary.

For PM_{10}, the model was found to over predict measured concentrations by 26%. This is due to measured urban background PM_{10} concentrations at Errol Place (See Table 4-3) exceeding those at the Union Street roadside automatic monitor. It is of note that the modelled concentration of PM_{10} shows good agreement with the PM_{10} concentrations measured at CM2 during 2018 (15µg/m³). Therefore, as good agreement was achieved between measured and modelled concentrations of NO_2 and $PM_{2.5}$ and the predicted PM10 concentration shows good agreement with previous measured results the modelling has proceeded with this over prediction for PM_{10} in place. Modelled concentrations of PM_{10} at the included sensitive receptors are therefore considered to be conservative.

5.2 Model Results

The following sections detail the modelled results for each of the investigated scenarios for the pollutants NO_2, PM_{10} and $PM_{2.5}$.

As outlined in above, the model has not assumed any improvement in background pollutant concentrations between assessment scenarios.

5.2.1 2019 Baseline Results

Table 5-2 summaries the results from the ADMS-Roads model for the '2019 Baseline' scenario for NO_2, PM_{10} and $PM_{2.5}$.

Table 5-2: 2019 Baseline Results

ID	Receptor Description	Pollutant Concentration (µg/m³)		
		NO_2	PM_{10}	$PM_{2.5}$
SR1 6m	Receptor 1 – First Floor	35.91	15.01	7.64
SR2 6m	Receptor 2 – First Floor	36.03	15.02	7.65
SR1 10m	Receptor 1 – Second Floor	34.1	14.91	7.58
SR2 10m	Receptor 2 – Second Floor	34.19	14.91	7.58
SR1 14m	Receptor 1 – Third Floor	33.36	14.86	7.55
SR2 14m	Receptor 1 – Third Floor	33.39	14.87	7.55

The predicted NO_2, PM_{10} and $PM_{2.5}$ concentrations for the 2019 Baseline scenario were found to meet the relevant Air Quality Objectives of 40, 18 & 10µg/m^3 at all Sensitive Receptors.

5.2.2 2021 Baseline + Committed Development Results

Table 5-3 summarises the results from the ADMS-Roads model for the '2021 Baseline + Committed + Development' scenario for NO_2, PM_{10} and $PM_{2.5}$.

Table 5-3: 2021 Baseline + Committed Development Results

ID	Receptor Description	Pollutant Concentration (µg/m³)		
		NO_2	PM_{10}	$PM_{2.5}$
SR1 6m	Receptor 1 – First Floor	34.57	15.02	7.62
SR2 6m	Receptor 2 – First Floor	34.68	15.03	7.63
SR1 10m	Receptor 1 – Second Floor	32.88	14.92	7.56
SR2 10m	Receptor 2 – Second Floor	32.96	14.92	7.56
SR1 14m	Receptor 1 – Third Floor	32.18	14.87	7.53
SR2 14m	Receptor 1 – Third Floor	32.21	14.87	7.53

As with the '2019 Baseline' scenario, the predicted NO_2, PM_{10} and $PM_{2.5}$ concentrations for the 2021 Baseline + Committed Development scenario were found to meet the relevant Air Quality Objectives of 40, 18 & 10µg/m^3 at all Sensitive Receptors.

6 CONCLUSIONS

An air quality assessment was undertaken utilising an ADMS-Roads air quality model to investigate if there was potential for traffic emissions to lead to future residents of the apartments of the proposed development with windows facing on to Union Street being exposed to pollutant concentrations in exceedance of their relevant National Air Quality Objectives. Should predicted pollutant concentrations exceed the relevant National Air Quality Objectives at any of the considered receptors there would be a requirement for mechanical ventilation to be installed at the windows with a fresh air intake system providing air from a source away from Union Street.

Predicted concentrations of NO_2, PM_{10} and $PM_{2.5}$ for the 2021 Baseline + Committed Development scenario were found to meet the relevant Air Quality Objectives of 40, 18 & 10µg/m^3 at all assessed Sensitive Receptors.

The results therefore indicate that there will be no requirement for mechanical ventilation at any of the Union Street facing windows of the development in order to meet National Air Quality targets for future residents.

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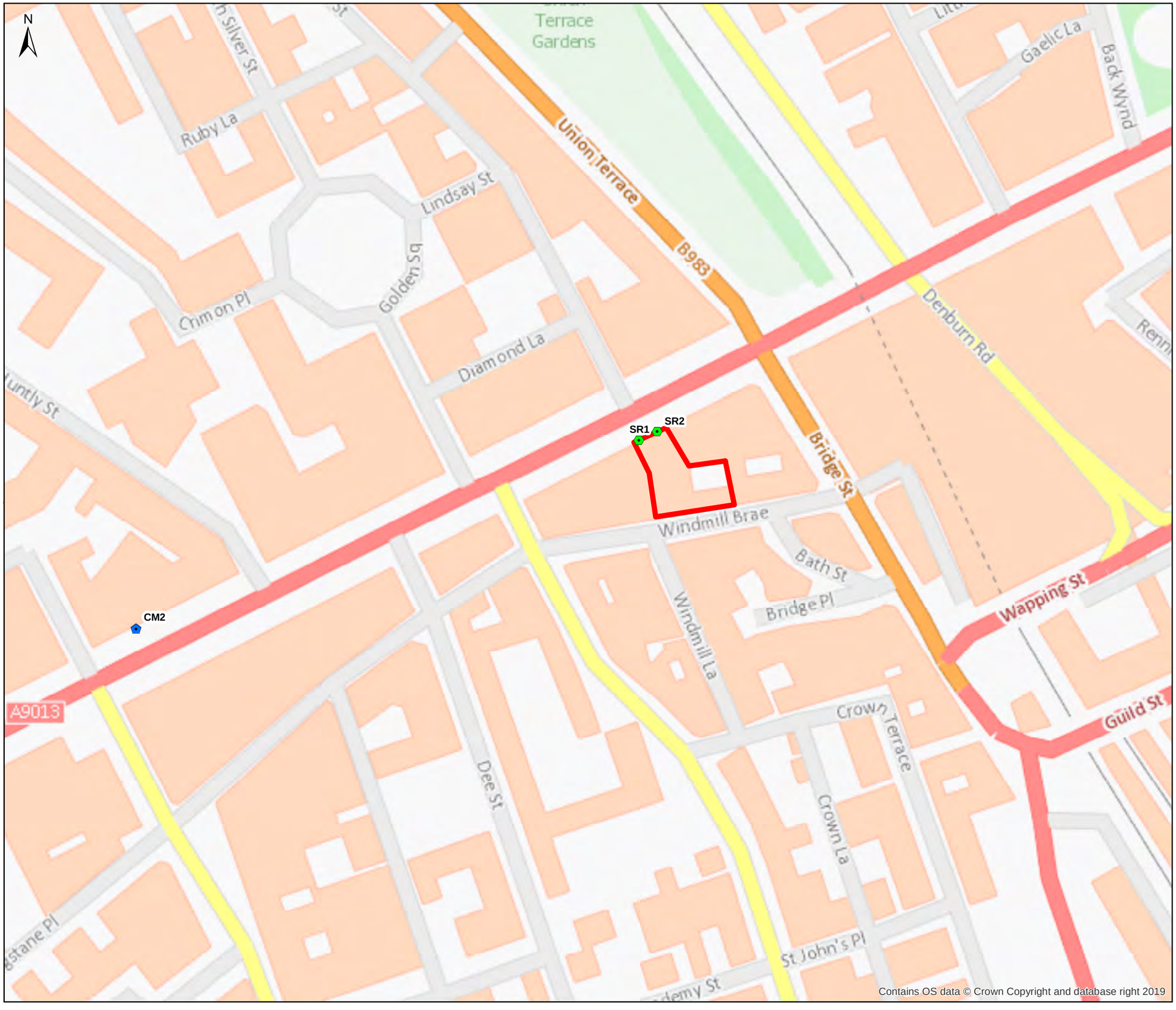
APPENDICES

A DRAWINGS



Legend

- Site Boundary
- Sensitive Receptor
- Automatic Monitor

Do not scale this map

Client
SAVA Estates

Project
181 Union Street, Aberdeen

Title
Air Quality Sensitve Receptor Plan

Status
Final

Drawing No.	Revision	Date
373949-001	-	12 August 2020
Drawn	**Checked**	**Approved**
BC	EC	EC

Scale
1:1,500 @A3
0 5 10 20 30 Metres

Rev	Date	Amendment	Initials
-	-	-	-

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Legend

- Site Boundary
- Sensitive Receptor

NO2 Concentration (µg/m3)

- <25
- 25 - 30
- 30 - 35
- 35 - 40
- >40

Do not scale this map

Client
SAVA Estates

Project
181 Union Street, Aberdeen

Title
Predcited NO2 Concentrations
2019 Baseline Scenario

Status
Final

Drawing No.	Revision	Date
373949-002	-	09 Sept 2020
Drawn	**Checked**	**Approved**
BC	EC	EC

Scale
1:500 @A3
0 2.5 5 10 15 Metres

Rev	Date	Amendment	Initials
-	-	-	-

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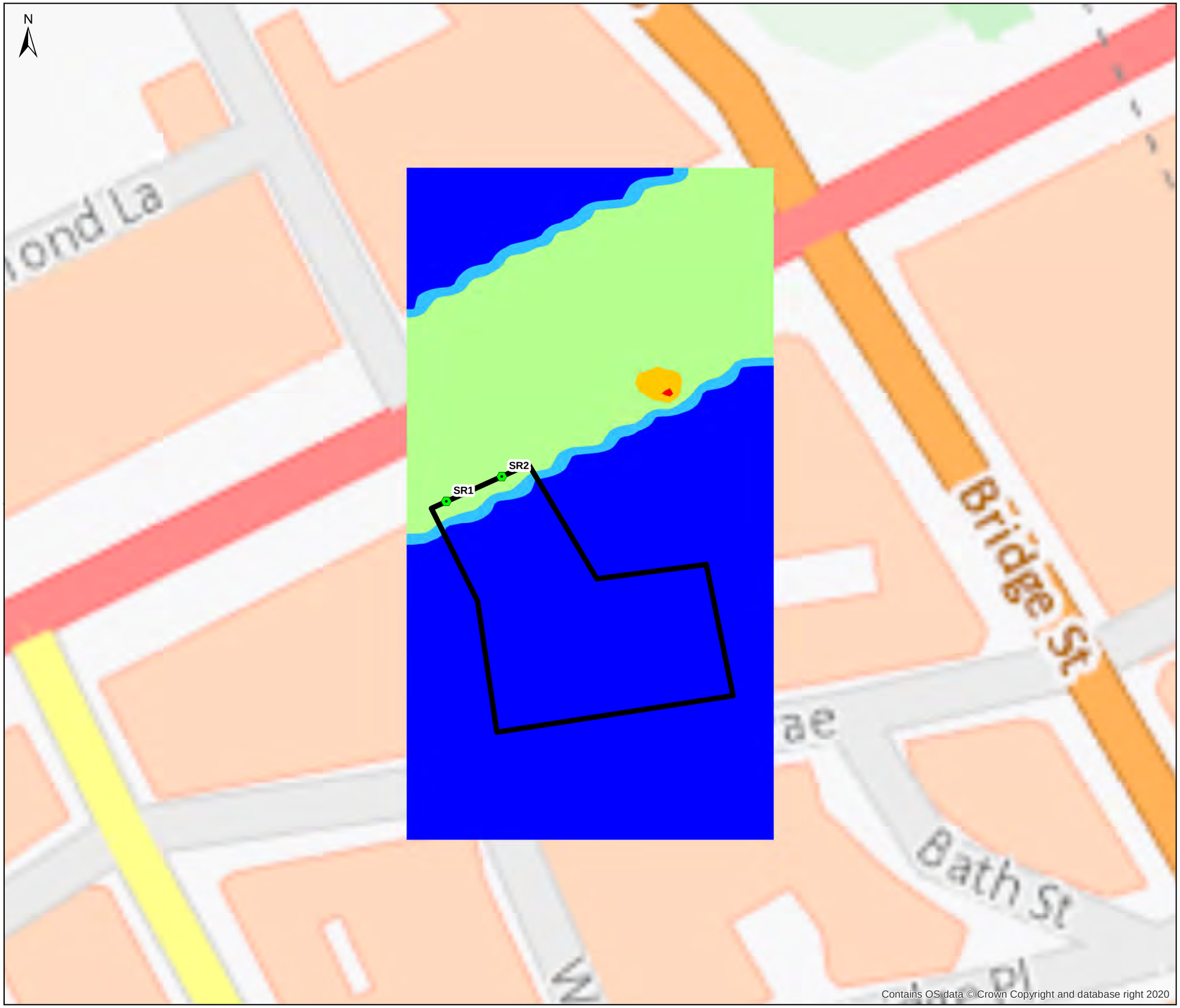

Legend

- Site Boundary
- Sensitive Receptor

NO2 Concentration (µg/m3)

- <25
- 25 - 30
- 30 - 35
- 35 - 40
- >40

Do not scale this map

Client
SAVA Estates

Project
181 Union Street, Aberdeen

Title
Predcited NO2 Concentrations
2021 Baseline + Committed Scenario

Status
Final

Drawing No.	Revision	Date
373949-003	-	09 Sept 2020
Drawn	**Checked**	**Approved**
BC	EC	EC

Scale
1:500 @A3
0 2.5 5 10 15 Metres

Rev	Date	Amendment	Initials
-	-	-	-

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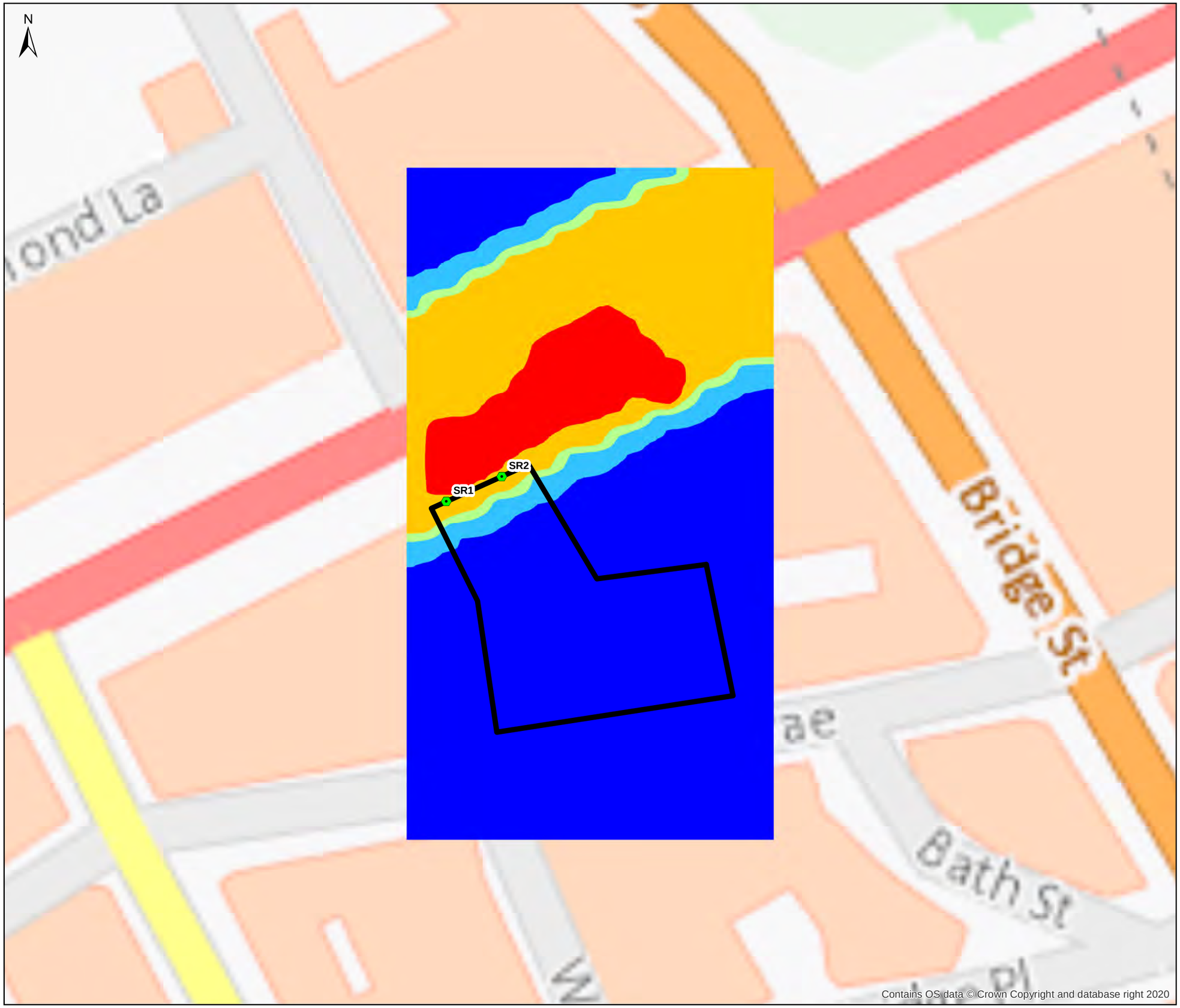

Legend

- Site Boundary
- Sensitive Receptor

PM10 Concentration (µg/m3)

- <14.25
- 14.25 - 14.5
- 14.5 - 14.75
- 14.75 - 15
- >15

Do not scale this map

Client
SAVA Estates

Project
181 Union Street, Aberdeen

Title
Predcited PM10 Concentrations
2019 Baseline Scenario

Status
Final

Drawing No.	Revision	Date
373949-004	-	09 Sept 2020
Drawn	**Checked**	**Approved**
BC	EC	EC

Scale
1:500 @A3
0 2.5 5 10 15 Metres

Rev	Date	Amendment	Initials
-	-	-	-

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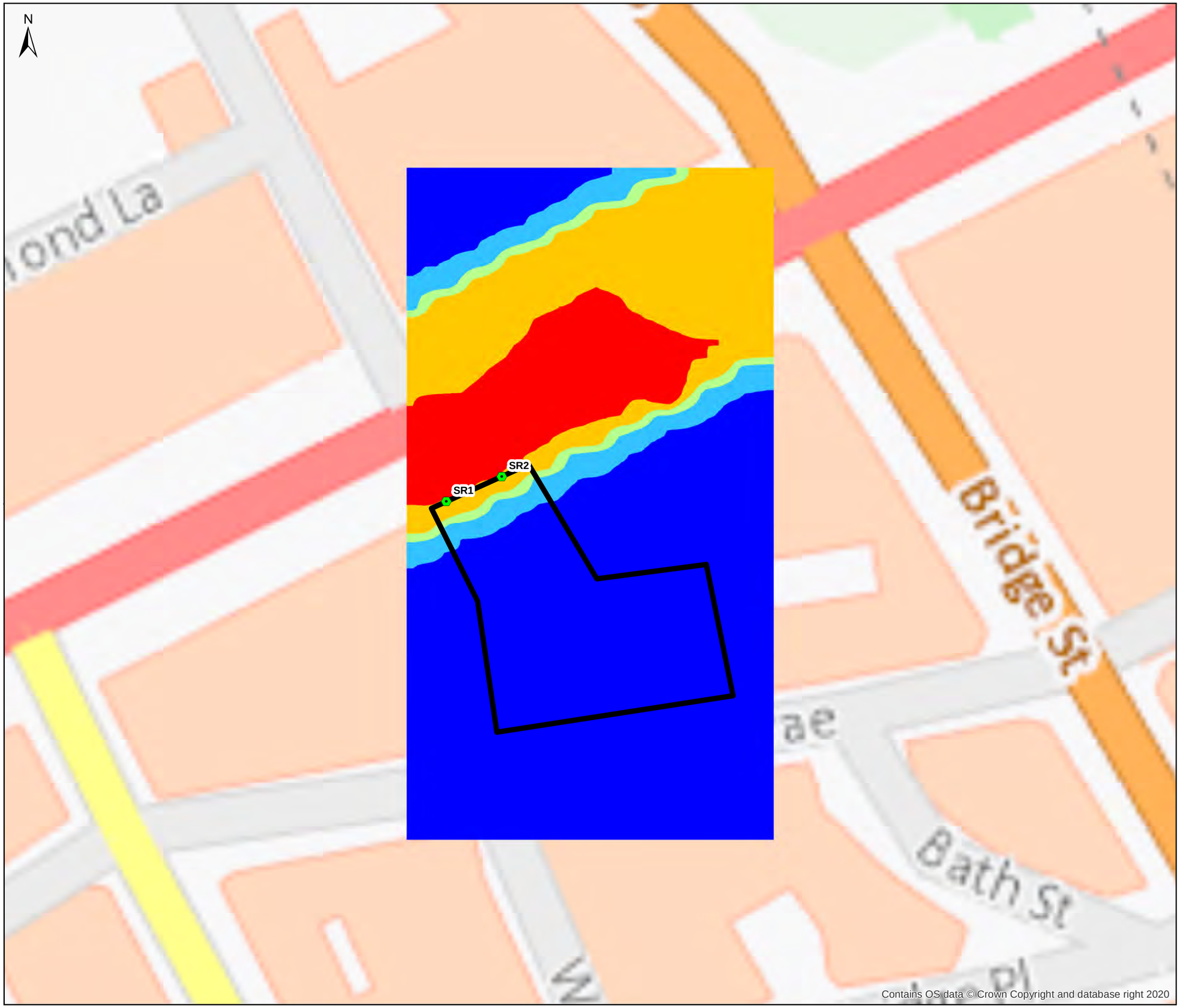

Legend

- Site Boundary
- Sensitive Receptor

PM10 Concentration (µg/m3)

- <14.25
- 14.25 - 14.5
- 14.5 - 14.75
- 14.75 - 15
- >15

Do not scale this map

Client
SAVA Estates

Project
181 Union Street, Aberdeen

Title
Predcited PM10 Concentrations
2021Baseline + Committed Scenario

Status
Final

Drawing No.	Revision	Date
373949-005	-	09 Sept 2020
Drawn	**Checked**	**Approved**
BC	EC	EC

Scale
1:500 @A3
0 2.5 5 10 15 Metres

Rev	Date	Amendment	Initials
-	-	-	-

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Legend

- Site Boundary
- Sensitive Receptor

PM2.5 Concentration (µg/m3)

- <7.2
- 7.2 - 7.4
- 7.4 - 7.6
- 7.6 - 7.8
- >7.8

Do not scale this map

Client
SAVA Estates

Project
181 Union Street, Aberdeen

Title
Predcited PM2.5 Concentrations
2019 Baseline Scenario

Status
Final

Drawing No.	Revision	Date
373949-006	-	09 Sept 2020
Drawn	**Checked**	**Approved**
BC	EC	EC

Scale
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0 2.5 5 10 15 Metres

Rev	Date	Amendment	Initials
-	-	-	-

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Legend

- Site Boundary
- Sensitive Receptor

PM2.5 Concentration (µg/m3)

- <7.2
- 7.2 - 7.4
- 7.4 - 7.6
- 7.6 - 7.8
- >7.8

Do not scale this map

Client
SAVA Estates

Project
181 Union Street, Aberdeen

Title
Predcited PM2.5 Concentrations
2021 Baseline + Committed Scenario

Status
Final

Drawing No.	Revision	Date
373949-007	-	09 Sept 2020
Drawn	**Checked**	**Approved**
BC	EC	EC

Scale
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0 2.5 5 10 15 Metres

Rev	Date	Amendment	Initials
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B TRAFFIC DATA

Road Name	Road Type	Canyon Height (m)	Road Width (m)	Vehicle Speed (km/h)		2019 Baseline (Hourly)		2021 Baseline + Committed Development (Hourly)	
				LGV	HGV	LGV	HGV	LGV	HGV
Union Street	Urban	15	28	5	5	479	70	518	75