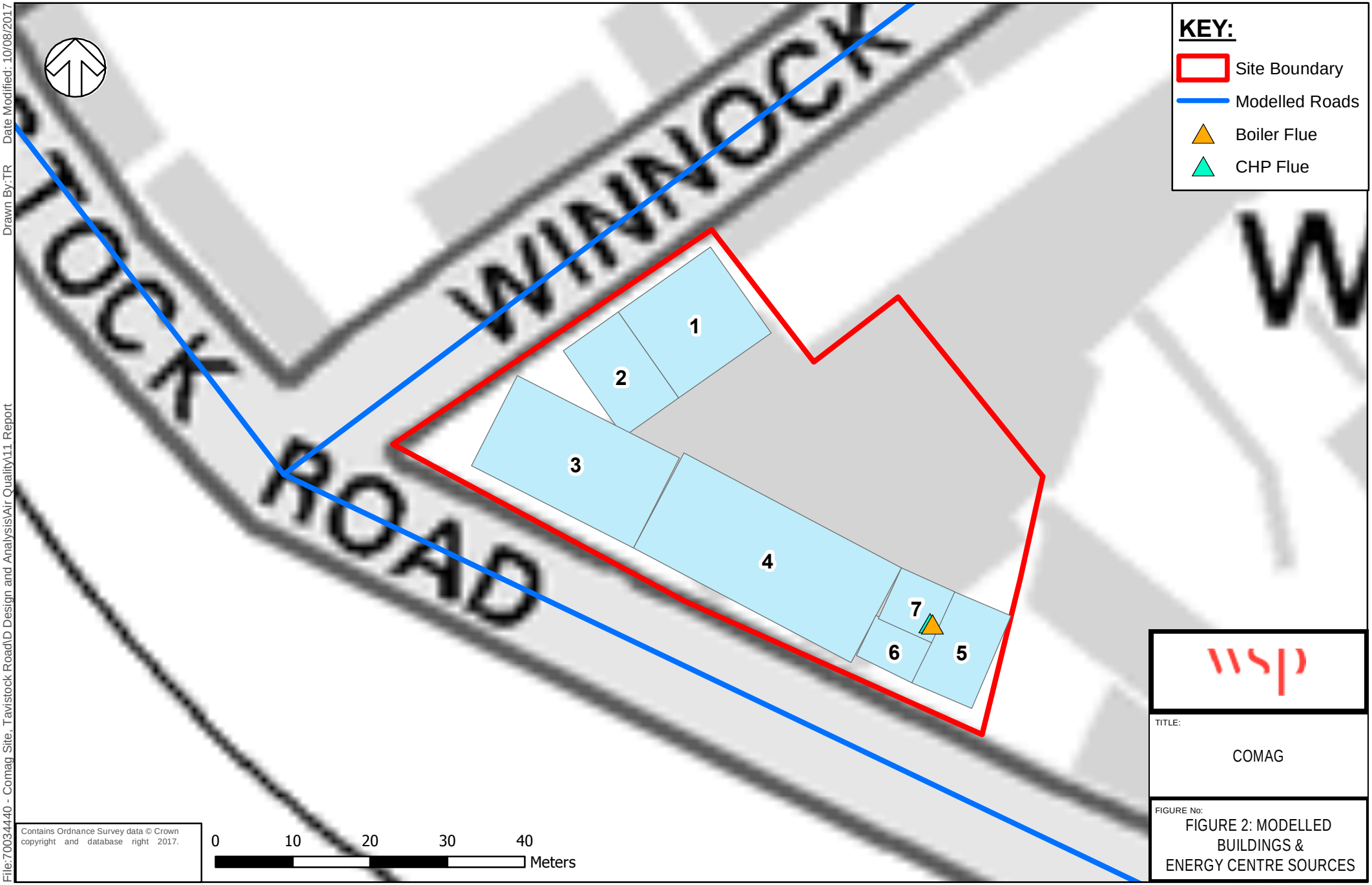
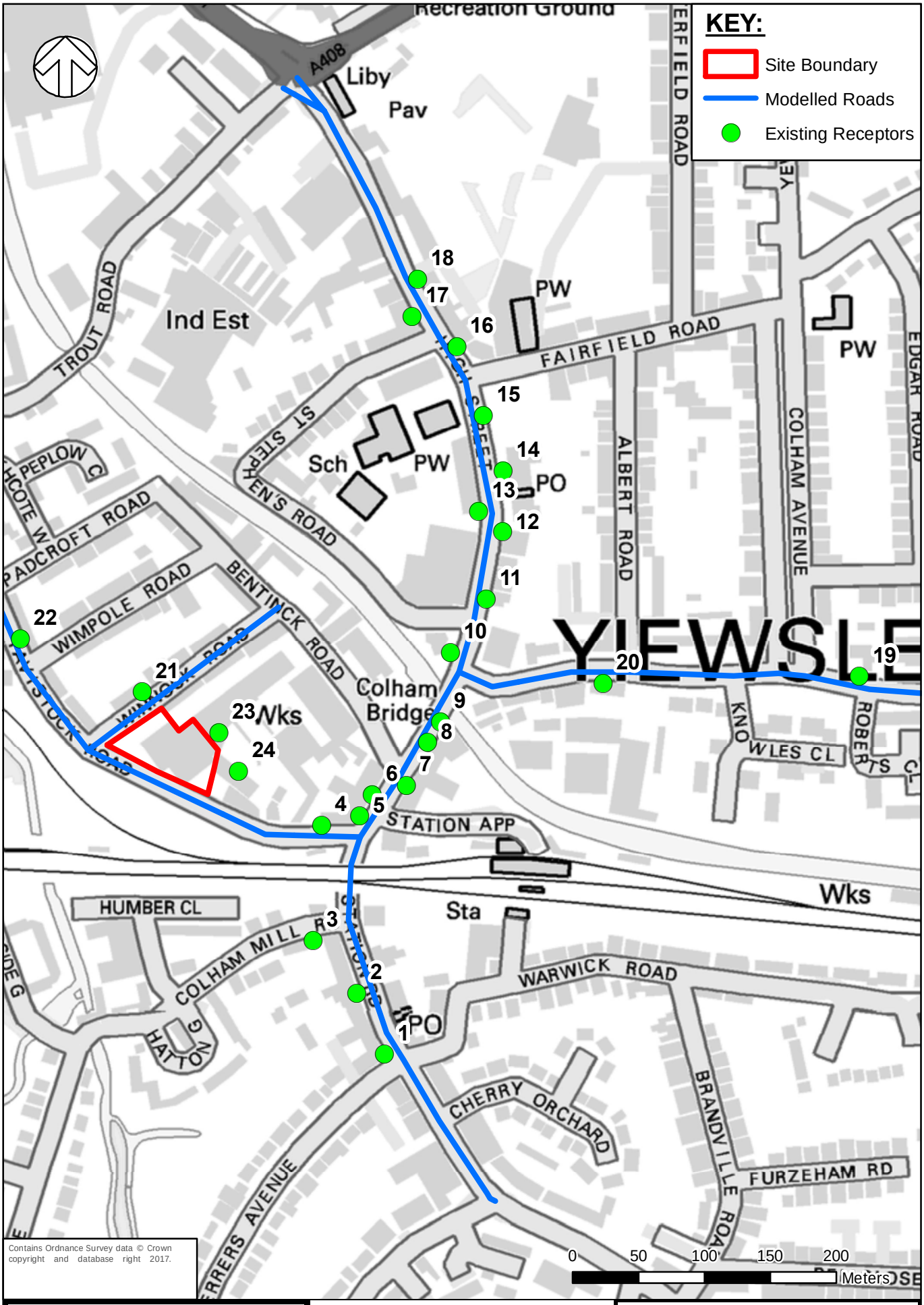

KEY:
Site Boundary
Modelled Roads
Boiler Flue
CHP Flue
WINNOCK
ROAD
1
2
3
4
5
6
7
0
10
20
30
40
Meters
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TITLE:
COMAG
FIGURE No:
FIGURE 2: MODELLED BUILDINGS & ENERGY CENTRE SOURCES
Drawn By:TR
Date Modified: 10/08/2017
File:70034440 - Comag Site, Tavistock Road\D Design and Analysis\Air Quality\11 Report



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TITLE:

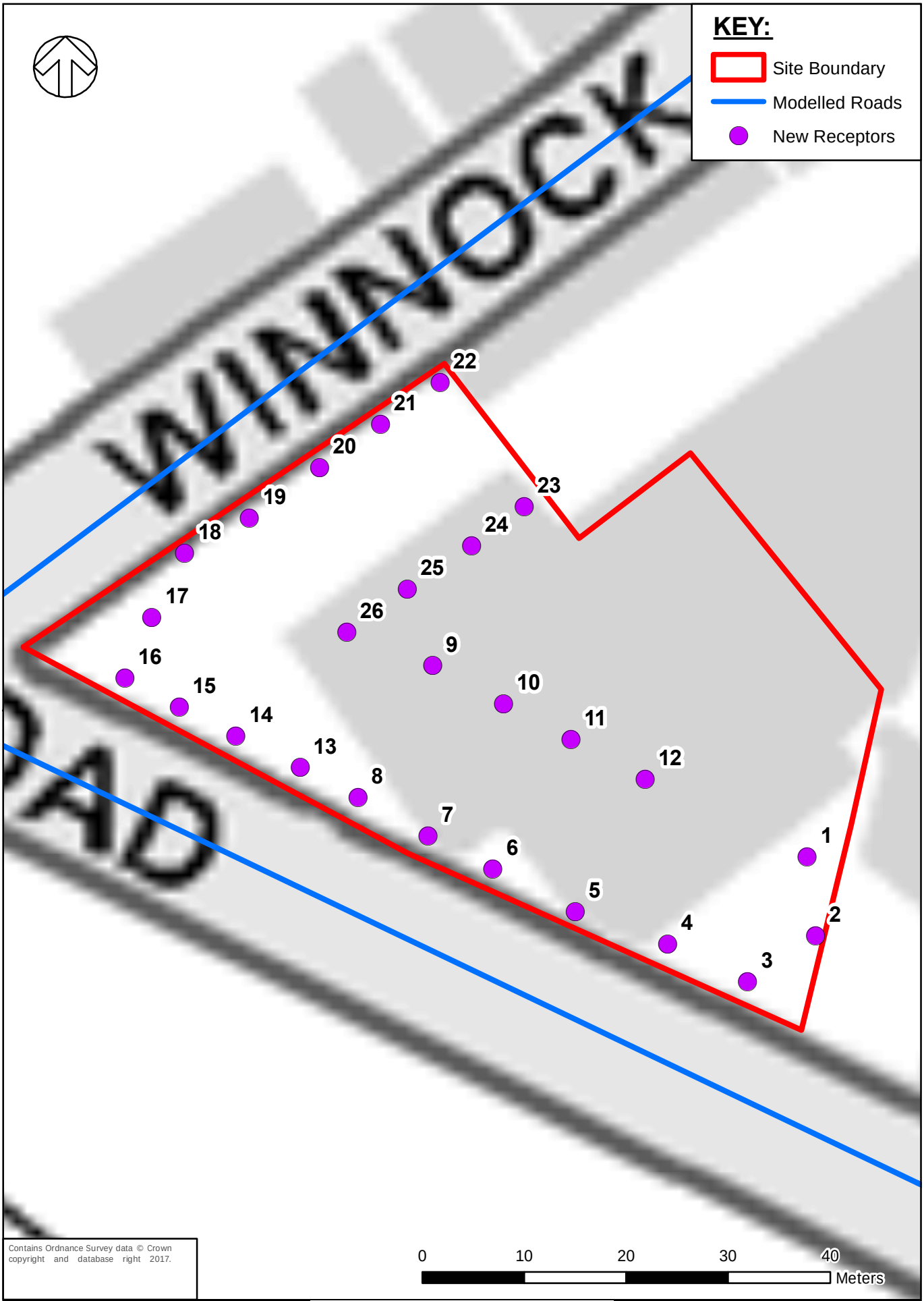
COMAG

FIGURE No:

FIGURE 3A: EXISTING RECEPTORS

Drawn By: TR Date Modified: 11/08/2017

File: \70034440 - Comag Site, Tavistock Road\D Design and Analysis\Air Quality\11 Report



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TITLE:

COMAG

FIGURE No:

FIGURE 3B: NEW RECEPTORS

Drawn By: TR Date Modified: 11/08/2017

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Drawn By: TR Date Modified: 11/07/2017

File:70034440 - Comag Site, Tavistock Road\D Design and Analysis\Air Quality\11 Report

wsp

TITLE:

COMAG

FIGURE No:

FIGURE 4A: 2013 LAEI ANNUAL MEAN NO_2 BASELINE CONCENTRATIONS



File:70034440 - Comag Site, Tavistock Road\D Design and Analysis\Air Quality\11 Report Drawn By: TR Date Modified: 11/07/2017

wsp

TITLE:

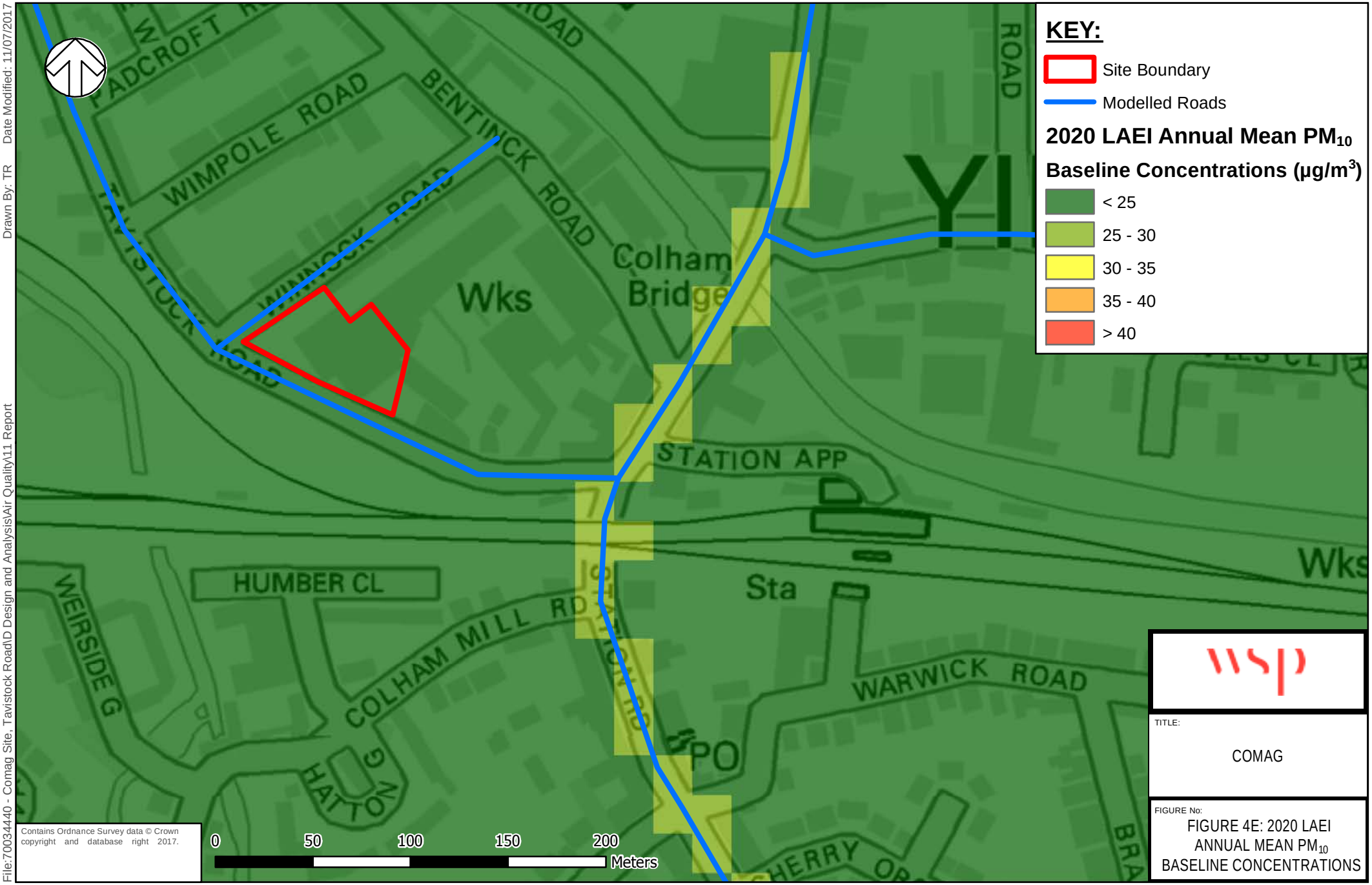
COMAG

FIGURE No:

FIGURE 4B: 2013 LAEI ANNUAL MEAN PM_{10} BASELINE CONCENTRATIONS


KEY:
Site Boundary
Modelled Roads
2013 LAEI Annual Mean PM2.5
Baseline Concentrations (µg/m3)
< 16
16 - 19
19 - 22
22 - 25
> 25
WIMPOLE ROAD
BENTINCK ROAD
WINNOCK ROAD
TAVISTOCK ROAD
Colham Bridge
Wks
STATION APP
HUMBER CL
COLHAM MILL RD
WEIRSIDE G
HATTON G
WARWICK ROAD
PO
Sta
0
50
100
150
200
Meters
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TITLE:
COMAG
FIGURE No:
FIGURE 4C: 2013 LAEI ANNUAL MEAN PM2.5 BASELINE CONCENTRATIONS
Drawn By: TR
Date Modified: 11/07/2017
File:70034440 - Comag Site, Tavistock Road\D Design and Analysis\Air Quality\11 Report


KEY:
Site Boundary
Modelled Roads
2020 LAEI Annual Mean NO2
Baseline Concentrations (µg/m3)
< 30
30 - 35
35 - 40
40 - 50
50 - 60
> 60
WIMPOLE ROAD
BENTINCK ROAD
WINNOCK ROAD
TAVISTOCK ROAD
Colham Bridge
Wks
STATION APP
HUMBER CL
COLHAM MILL RD
WEIRSIDE G
HATTON G
WARWICK ROAD
Sta
PO
0
50
100
150
200
Meters
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wsp
TITLE:
COMAG
FIGURE No:
FIGURE 4D: 2020 LAEI ANNUAL MEAN NO2 BASELINE CONCENTRATIONS
Date Modified: 11/07/2017
Drawn By: TR
File:70034440 - Comag Site, Tavistock Road\D Design and Analysis\Air Quality\11 Report



TITLE:

COMAG

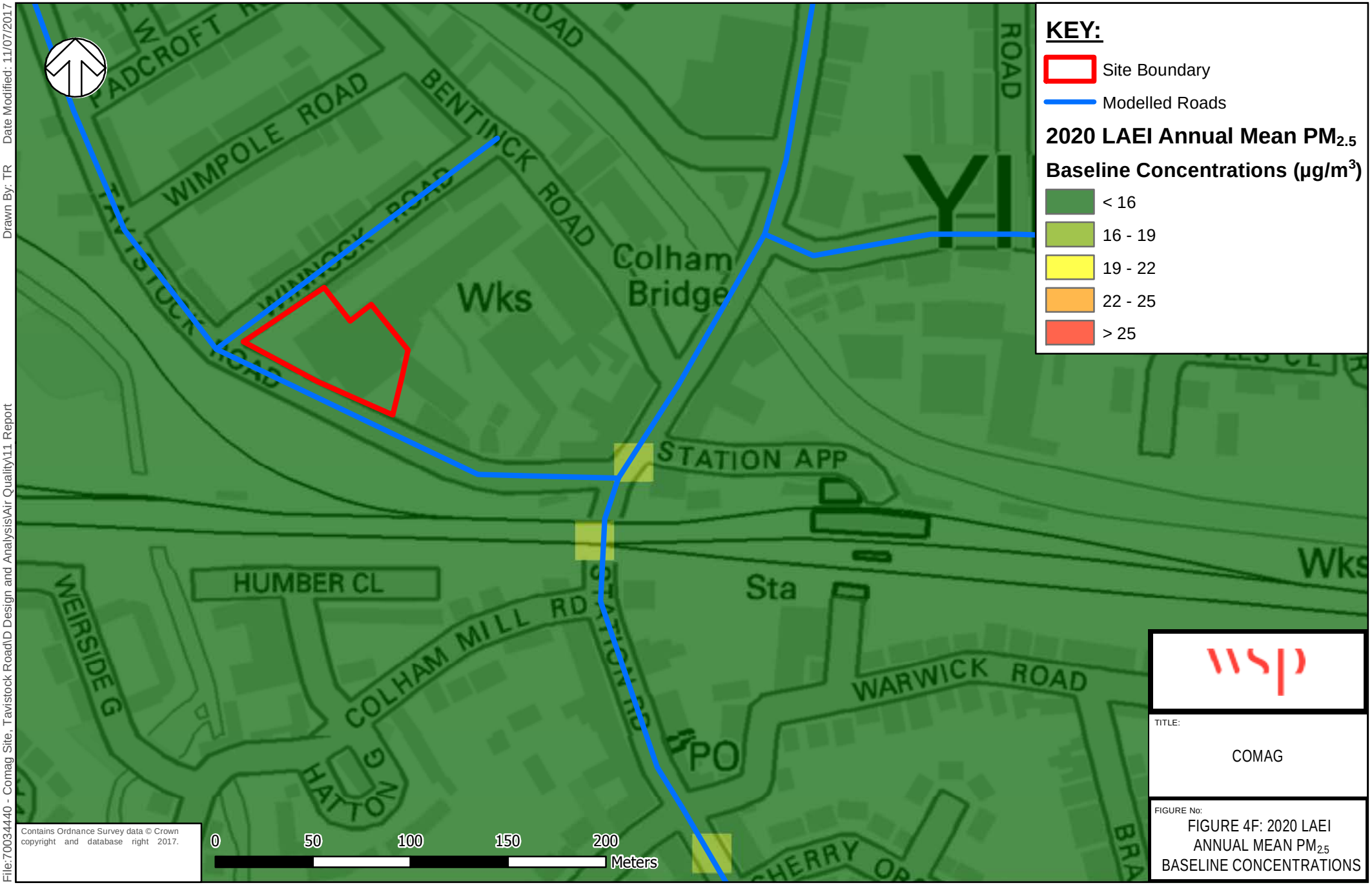
FIGURE No:

FIGURE 4E: 2020 LAEI ANNUAL MEAN PM_{10} BASELINE CONCENTRATIONS

Date Modified: 11/07/2017

Drawn By: TR

File:70034440 - Comag Site, Tavistock Road\D Design and Analysis\Air Quality\11 Report



File:70034440 - Comag Site, Tavistock Road\D Design and Analysis\Air Quality\11 Report
Drawn By: TR
Date Modified: 11/07/2017

TITLE:
COMAG

FIGURE No:
FIGURE 4F: 2020 LAEI ANNUAL MEAN $PM_{2.5}$ BASELINE CONCENTRATIONS

Appendix A

GLOSSARY

Term	Definition
AADT Annual Average Daily Traffic	A daily total traffic flow (24hrs), expressed as a mean daily flow across all 365 days of the year.
Adjustment	Application of a correction factor to modelled results to account for uncertainties in the model.
Accuracy	A measure of how well a set of data fits the true value.
Air quality objective	Policy target generally expressed as a maximum ambient concentration to be achieved, either without exception or with a permitted number of exceedances within a specific timescale (see also air quality standard).
Air quality standard	The concentrations of pollutants in the atmosphere which can broadly be taken to achieve a certain level of environmental quality. The standards are based on the assessment of the effects of each pollutant on human health including the effects on sensitive sub groups (see also air quality objective).
Ambient air	Outdoor air in the troposphere, excluding workplace air.
Annual mean	The average (mean) of the concentrations measured for each pollutant for one year.
AQMA	Air Quality Management Area.
AURN	Automatic Urban and Rural (air quality monitoring) Network, managed by contractors on behalf of Defra
Conservative	Tending to over-predict the impact rather than under-predict.
Data capture	The percentage of all the possible measurements for a given period that were validly measured.
Defra	Department for Environment, Food and Rural Affairs.
DfT	Department for Transport.
Dust	Dust comprises particles typically in the size range 1-75 micrometres (µm) in aerodynamic diameter and is created through the action of crushing and abrasive forces on materials
Emission rate	The quantity of a pollutant released from a source over a given period of time.
Exceedance	A period of time where the concentrations of a pollutant is greater than the appropriate air quality standard.
Fugitive emissions	Emissions arising from the passage of vehicles that do not arise from the exhaust system.
HDV/HGV	Heavy Duty Vehicle/Heavy Goods Vehicle.
LAQM	Local Air Quality Management.
Line source	Emission source considered to be mobile and to follow a well-defined path (e.g., road transport).
Minor roads	Non “A” roads or Motorways.
Model adjustment	Following model verification, the process by which modelled results are amended. This corrects for systematic error.
NO_2	Nitrogen dioxide.
NO_x	Nitrogen oxides.
PM_{10}	Particulate matter with an aerodynamic diameter of less than 10 micrometres.
$PM_{2.5}$	Particulate matter with an aerodynamic diameter of less than 2.5 micrometres.

Term	Definition
Ratification (Monitoring)	Involves a critical review of all information relating to a data set, in order to amend or reject the data. When the data have been ratified they represent the final data to be used (see also validation).
Road link	A length of road which is considered to have the same flow of traffic along it. Usually, a link is the road from one junction to the next.
Trackout	The transport of dust and dirt from the construction / demolition site onto the public road network, where it may be deposited and then re-suspended by vehicles using the network. This arises when heavy duty vehicles (HDVs) leave the construction / demolition site with dusty materials, which may then spill onto the road, and/or when HDVs transfer dust and dirt onto the road having travelled over muddy ground on site.
$\mu g/m^3$ micrograms per cubic metre	A measure of concentration in terms of mass per unit volume. A concentration of $1\mu g/m^3$ means that one cubic metre of air contains one microgram (millionth of a gram) of pollutant.
Uncertainty	A measure, associated with the result of a measurement, which characterizes the range of values within which the true value is expected to lie. Uncertainty is usually expressed as the range within which the true value is expected to lie with a 95% probability, where standard statistical and other procedures have been used to evaluate this figure. Uncertainty is more clearly defined than the closely related parameter 'accuracy', and has replaced it on recent European legislation.
Validation (modelling)	Refers to the general comparison of modelled results against monitoring data carried out by model developers.
Validation (monitoring)	Screening monitoring data by visual examination to check for spurious and unusual measurements (see also ratification).
Verification (modelling)	Comparison of modelled results versus any local monitoring data at relevant locations.

Appendix B

RELEVANT UK AIR QUALITY STRATEGY OBJECTIVES

National Air Quality Objectives and European Directive Limit Values for the protection of human health						
Pollutant	Applies to	Objective	Measured as	Date to be achieved by and maintained thereafter	European Obligations	Date to be achieved by and maintained thereafter
Nitrogen dioxide (NO_2)	UK	200µg/m^3 not to be exceeded more than 18 times a year	1 hour mean	31.12.2005	200µg/m^3 not to be exceeded more than 18 times a year	01.01.2010
	UK	40µg/m^3	annual mean	31.12.2005	40µg/m^3	01.01.2010
Particulate Matter (PM_{10}) (gravimetric)†	UK (except Scotland)	40µg/m^3	annual mean	31.12.2004	40µg/m^3	01.01.2005
	UK (except Scotland)	50µg/m^3 not to be exceeded more than 35 times a year	24 hour mean	31.12.2004	50µg/m^3 not to be exceeded more than 35 times a year	01.01.2005
Particulate Matter ($PM_{2.5}$)	UK (except Scotland)	25µg/m3	annual mean	2020	Target value 25µg/m3	2010

†Measured using the European gravimetric transfer sampler or equivalent

µg/m^3 = microgram per cubic metre

Appendix C

IAQM CONSTRUCTION ASSESSMENT METHODOLOGY

STEP 1 – SCREENING THE NEED FOR A DETAILED ASSESSMENT

An assessment will normally be required where there are:

- 'Human receptors' within 350m of the site boundary; or within 50m of the route(s) used by construction vehicles on the public highway, up to 500m from the site entrance(s); and/or
- 'Ecological receptors' within 50m of the site boundary; or within 50m of the route(s) used by construction vehicles on the public highway, up to 500m from the site entrance(s).

Where the need for a more detailed assessment is screened out, it can be concluded that the level of risk is "negligible".

STEP 2A – DEFINE THE POTENTIAL DUST EMISSION MAGNITUDE

The following are examples of how the potential dust emission magnitude for different activities can be defined. (Note that not all the criteria need to be met for a particular class). Other criteria may be used if justified in the assessment.

Table 2A: Examples of Human Receptor Sensitivity to Construction Phase Impacts

Dust Emission Magnitude	Activity
Large	Demolition >50,000m^3 building demolished, dusty material (e.g. concrete), on-site crushing/screening, demolition >20m above ground level
	Earthworks >10,000m^2 site area, dusty soil type (e.g. clay), >10 earth moving vehicles active simultaneously, >8m high bunds formed, >100,000 tonnes material moved
	Construction >100,000m^3 building volume, on site concrete batching, sandblasting
	Trackout >50 HDVs out / day, dusty surface material (e.g. clay), >100m unpaved roads
Medium	Demolition 20,000 - 50,000m^3 building demolished, dusty material (e.g. concrete), 10-20m above ground level
	Earthworks 2,500-10,000m^2 site area, moderately dusty soil (e.g. silt), 5-10 earth moving vehicles active simultaneously, 4m-8m high bunds, 20,000-100,000 tonnes material moved
	Construction 25,000-100,000m^3 building volume, dusty material e.g. concrete, on site concrete batching
	Trackout 10-50 HDVs out / day, moderately dusty surface material (e.g. clay), 50-100m unpaved roads
Small	Demolition <20,000m^3 building demolished, non-dusty material (e.g metal cladding), <10m above ground level, work during wetter months
	Earthworks <2,500m^2 site area, soil with large grain size (e.g. sand), <5 earth moving vehicles active simultaneously, <4m high bunds, <20,000 tonnes material moved, earthworks during wetter months
	Construction <25,000m^3, non-dusty material (e.g. metal cladding or timber)
	Trackout

Dust Emission Magnitude	Activity
	<10 HDVs out / day, non-dusty soil, < 50m unpaved roads

STEP 2B – DEFINE THE SENSITIVITY OF THE AREA

The tables below present the IAQM assessment methodology to determine the sensitivity of the area to dust soiling, human health and ecological impacts respectively. The IAQM guidance provides guidance to allow the sensitivity of individual receptors to dust soiling and health effects to assist in the assessment of the overall sensitivity of the study area.

Table 2Ba: Sensitivity of the Area to Dust Soiling Effects

Receptor Sensitivity	Number of Receptors	Distance from the Source (m)			
		<20	<50	<100	<350
High	>100	High	High	Medium	Low
	10-100	High	Medium	Low	Low
	1-10	Medium	Low	Low	Low
Medium	>1	Medium	Low	Low	Low
Low	>1	Low	Low	Low	Low

TABLE 2Bb: SENSITIVITY OF THE AREA TO HUMAN HEALTH IMPACTS

Receptor Sensitivity	Annual Mean PM_{10} Concentration (µg/m^3)	Number of Receptors	Distance from the Source (m)				
			<20	<50	<100	<200	<350
High	>32	>100	High	High	High	Medium	Low
		10-100	High	High	Medium	Low	Low
		1-10	High	Medium	Low	Low	Low
	28-32	>100	High	High	Medium	Low	Low
		10-100	High	Medium	Low	Low	Low
		1-10	High	Medium	Low	Low	Low
	24-28	>100	High	Medium	Low	Low	Low
		10-100	High	Medium	Low	Low	Low
		1-10	Medium	Low	Low	Low	Low
	<24	>100	Medium	Low	Low	Low	Low
		10-100	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
Medium	>32	>10	High	Medium	Low	Low	Low
		1-10	Medium	Low	Low	Low	Low
	28-32	>10	Medium	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
	24-28	>10	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
	<24	>10	Low	Low	Low	Low	Low

Receptor	Annual Mean PM_{10}	Number of	Distance from the Source (m)				
		1-10	Low	Low	Low	Low	Low
Low	-	>1	Low	Low	Low	Low	Low

TABLE 2Bc: SENSITIVITY OF THE AREA TO ECOLOGICAL IMPACTS

Receptor Sensitivity	Distance from the Sources (m)	
	<20	<50
High	High	Medium
Medium	Medium	Low
Low	Low	Low

STEP 2C – DEFINE THE RISK OF IMPACTS

The dust emissions magnitude determined at Step 2A should be combined with the sensitivity of the area determined at Step 2B to determine the risk of impacts without mitigation applied. For those cases where the risk category is 'negligible' no mitigation measures beyond those required by legislation will be required.

Table 2C: Risk of Dust Impacts

Sensitivity of surrounding area	Dust Emission Magnitude		
	Large	Medium	Small
Demolition			
High	High Risk	Medium Risk	Medium Risk
Medium	High Risk	Medium Risk	Low Risk
Low	Medium Risk	Low Risk	Negligible
Earthworks and Construction			
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible
Trackout			
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Low Risk	Negligible
Low	Low Risk	Low Risk	Negligible

STEP 3 –SITE SPECIFIC MITIGATION

Having determined the risk categories for each of the four activities it is possible to determine the site-specific measures to be adopted. These measures will be related to whether the site is considered to be a low, medium or high risk site. The IAQM guidance details the mitigation measures required for high, medium and low risk sites as determined in Step 2C.

STEP 4 – DETERMINE SIGNIFICANT EFFECTS

Once the risk of dust impacts has been determined in Step 2C and the appropriate dust mitigation measures identified in Step 3, the final step is to determine whether there are significant effects arising from the construction phase. For almost all construction activities, the application of effective mitigation should prevent any significant effects occurring to sensitive receptors and therefore the residual effect will normally be negligible.

Appendix D

TRAFFIC DATA

DEVELOPMENT GENERATED ROAD TRAFFIC

Road Link	Speed (kph)	AADT	% HDV	NO_x Emission Rates (g/km/s)	PM_{10} Emission Rates (g/km/s)	$PM_{2.5}$ Emission Rates (g/km/s)
1	16	41	0	0.000252	0.000018	0.000012
2	16	45	0	0.000278	0.000020	0.000013
3	48	86	0	0.000356	0.000036	0.000022
4	48	42	0	0.000173	0.000017	0.000011
5	48	139	0	0.000575	0.000057	0.000035
6	48	8	0	0.000033	0.000003	0.000002
7	48	222	0	0.000920	0.000092	0.000056
8	48	8	0	0.000033	0.000003	0.000002
9	16	222	0	0.001369	0.000101	0.000064
10	16	42	0	0.000258	0.000019	0.000012
11	48	86	0	0.000356	0.000036	0.000022
12	48	86	0	0.000356	0.000036	0.000022
13	48	86	0	0.000356	0.000036	0.000022
14	48	86	0	0.000356	0.000036	0.000022

Appendix E

MODELLED BUILDINGS & ENERGY CENTRE INFORMATION

EMISSION PARAMETERS FOR ON SITE COMBUSTION SOURCES

Parameter	CHP	Each Boiler
Number of units	1	2
Location (x, y)	505870, 180179	505870, 180179
Stack height (m)	27.78	27.78
Flue diameter (m)	0.1	0.15
Velocity (m/s)	1.98	1.64
Release temperature (°C)	95	63
NOx emission rate (g/s)	0.0003299	0.00053
NOx emissions (mg/Nm^3)	50	37.3

MODELLED BUILDINGS

Building	Location (x, y)	Height (m)	Length (m)	Width (m)	Angle (°)
Building 1	505839, 180181	13.58	14.6	13.6	55.5
Building 2	180830, 180218	13.28	13.6	8.7	324.5
Building 3	505824, 180200	19.58	23.5	12	297
Building 4	505849, 180187	24.23	31.8	13.9	296
Building 5	505874, 180175	24.23	13	8.4	23
Building 6	505865, 180175	24.23	7.5	5	293
Building 7 (Main)	505868, 180181	27.38	7.6	7.2	23

Appendix F

MODELLED RECEPTORS

Receptor	Location	X	Y	Height above Ground Level (m)
E_1	Resi_1st Floor Above Lloyds Bank	506060	180272	1.5
E_2	Resi_1st Floor Above Boots	506088	180312	4.5
E_3	Resi_GF Corner Station/Colham Hill Rd	506100	180363	4.5
E_4	Resi_1st Floor Above Daphnes Grill	506082	180379	4.5
E_5	Resi_1st Floor Above Coopers	506100	180410	4.5
E_6	Resi_1st Floor Above Romans	506085	180451	4.5
E_7	Resi_1st Floor Station House Aptmnt	506065	180503	4.5
E_8	Resi_1st Floor Station House Aptmnt	506031	180527	4.5
E_9	Resi_GF Ashley Court	506035	180555	4.5
E_10	Resi_GF Art Wood Aptmnt	506370	180254	1.5
E_11	Resi_1st Floor Above Pharmacy	506176	180248	1.5
E_12	Resi_1st Floor Above Mandarin	505827	180242	1.5
E_13	Resi_1st Floor Above Yewlsey Halal Meat	505734	180282	1.5
E_14	Resi_1st Floor Above KFC	505885	180211	1.5
E_15	Resi_1st Floor Above Iceland	505900	180182	1.5
E_16	Resi_1st Floor Above Costa	505877	180181	1.5
E_17	Resi_1st Floor Above Subway	505877	180181	5.3
E_18	Resi_1st Floor Above Pizza Hut	505877	180181	8.5
E_19	Resi_GF Horton Road	505877	180181	11.6
E_20	Resi_GF Horton	505877	180181	14.8

Receptor	Location	X	Y	Height above Ground Level (m)
	Road			
E_21	Resi_GF Winnock Road	505877	180181	17.9
E_22	Resi_GF Tavistock Road	505877	180181	21.1
E_23	Existing Receptor on Current Construction Site	505877	180181	24.2
E_24	Existing Receptor on Current Construction Site	505877	180181	27.4
1_GF	New Receptor	505878	180174	1.5
1_1	New Receptor	505878	180174	5.3
1_2	New Receptor	505878	180174	8.5
1_3	New Receptor	505878	180174	11.6
1_4	New Receptor	505878	180174	14.8
1_5	New Receptor	505878	180174	17.9
1_6	New Receptor	505878	180174	21.1
1_7	New Receptor	505878	180174	24.2
1_8	New Receptor	505878	180174	27.4
2_GF	New Receptor	505871	180169	1.5
2_1	New Receptor	505871	180169	5.3
2_2	New Receptor	505871	180169	8.5
2_3	New Receptor	505871	180169	11.6
2_4	New Receptor	505871	180169	14.8
2_5	New Receptor	505871	180169	17.9
2_6	New Receptor	505871	180169	21.1
2_7	New Receptor	505871	180169	24.2
2_8	New Receptor	505871	180169	27.4
3_GF	New Receptor	505863	180173	1.5
3_1	New Receptor	505863	180173	5.3
3_2	New Receptor	505863	180173	8.5
3_3	New Receptor	505863	180173	11.6
3_4	New Receptor	505863	180173	14.8
3_5	New Receptor	505863	180173	17.9
3_6	New Receptor	505863	180173	21.1
3_7	New Receptor	505863	180173	24.2

Receptor	Location	X	Y	Height above Ground Level (m)
3_8	New Receptor	505863	180173	27.4
4_GF	New Receptor	505854	180176	1.5
4_1	New Receptor	505854	180176	5.3
4_2	New Receptor	505854	180176	8.5
4_3	New Receptor	505854	180176	11.6
4_4	New Receptor	505854	180176	14.8
4_5	New Receptor	505854	180176	17.9
4_6	New Receptor	505854	180176	21.1
4_7	New Receptor	505854	180176	24.2
4_8	New Receptor	505846	180180	1.5
5_GF	New Receptor	505846	180180	5.3
5_1	New Receptor	505846	180180	8.5
5_2	New Receptor	505846	180180	11.6
5_3	New Receptor	505846	180180	14.8
5_4	New Receptor	505846	180180	17.9
5_5	New Receptor	505846	180180	21.1
5_6	New Receptor	505846	180180	24.2
5_7	New Receptor	505840	180183	1.5
6_GF	New Receptor	505840	180183	5.3
6_1	New Receptor	505840	180183	8.5
6_2	New Receptor	505840	180183	11.6
6_3	New Receptor	505840	180183	14.8
6_4	New Receptor	505840	180183	17.9
6_5	New Receptor	505840	180183	21.1
6_6	New Receptor	505840	180183	24.2
6_7	New Receptor	505833	180187	1.5
7_GF	New Receptor	505833	180187	5.3
7_1	New Receptor	505833	180187	8.5
7_2	New Receptor	505833	180187	11.6
7_3	New Receptor	505833	180187	14.8
7_4	New Receptor	505833	180187	17.9
7_5	New Receptor	505833	180187	21.1
7_6	New Receptor	505833	180187	24.2
7_7	New Receptor	505840	180200	1.5
8_GF	New Receptor	505840	180200	5.3

Receptor	Location	X	Y	Height above Ground Level (m)
8_1	New Receptor	505840	180200	8.5
8_2	New Receptor	505840	180200	11.6
8_3	New Receptor	505840	180200	14.8
8_4	New Receptor	505840	180200	17.9
8_5	New Receptor	505840	180200	21.1
8_6	New Receptor	505840	180200	24.2
8_7	New Receptor	505847	180196	1.5
9_GF	New Receptor	505847	180196	5.3
9_1	New Receptor	505847	180196	8.5
9_2	New Receptor	505847	180196	11.6
9_3	New Receptor	505847	180196	14.8
9_4	New Receptor	505847	180196	17.9
9_5	New Receptor	505847	180196	21.1
9_6	New Receptor	505847	180196	24.2
9_7	New Receptor	505854	180193	1.5
10_GF	New Receptor	505854	180193	5.3
10_1	New Receptor	505854	180193	8.5
10_2	New Receptor	505854	180193	11.6
10_3	New Receptor	505854	180193	14.8
10_4	New Receptor	505854	180193	17.9
10_5	New Receptor	505854	180193	21.1
10_6	New Receptor	505854	180193	24.2
10_7	New Receptor	505861	180189	1.5
11_GF	New Receptor	505861	180189	5.3
11_1	New Receptor	505861	180189	8.5
11_2	New Receptor	505861	180189	11.6
11_3	New Receptor	505861	180189	14.8
11_4	New Receptor	505861	180189	17.9
11_5	New Receptor	505861	180189	21.1
11_6	New Receptor	505861	180189	24.2
11_7	New Receptor	505827	180190	1.5
12_GF	New Receptor	505827	180190	5.3
12_1	New Receptor	505827	180190	8.5
12_2	New Receptor	505827	180190	11.6
12_3	New Receptor	505827	180190	14.8

Receptor	Location	X	Y	Height above Ground Level (m)
12_4	New Receptor	505827	180190	17.9
12_5	New Receptor	505827	180190	21.1
12_6	New Receptor	505821	180193	1.5
12_7	New Receptor	505821	180193	5.3
13_GF	New Receptor	505821	180193	8.5
13_1	New Receptor	505821	180193	11.6
13_2	New Receptor	505821	180193	14.8
13_3	New Receptor	505821	180193	17.9
13_4	New Receptor	505821	180193	21.1
13_5	New Receptor	505815	180196	1.5
13_6	New Receptor	505815	180196	5.3
14_GF	New Receptor	505815	180196	8.5
14_1	New Receptor	505815	180196	11.6
14_2	New Receptor	505815	180196	14.8
14_3	New Receptor	505815	180196	17.9
14_4	New Receptor	505815	180196	21.1
14_5	New Receptor	505810	180199	1.5
14_6	New Receptor	505810	180199	5.3
15_GF	New Receptor	505810	180199	8.5
15_1	New Receptor	505810	180199	11.6
15_2	New Receptor	505810	180199	14.8
15_3	New Receptor	505810	180199	17.9
15_4	New Receptor	505810	180199	21.1
15_5	New Receptor	505813	180205	1.5
15_6	New Receptor	505813	180205	5.3
16_GF	New Receptor	505813	180205	8.5
16_1	New Receptor	505813	180205	11.6
16_2	New Receptor	505813	180205	14.8
16_3	New Receptor	505813	180205	17.9
16_4	New Receptor	505813	180205	21.1
16_5	New Receptor	505816	180211	1.5
16_6	New Receptor	505816	180211	5.3
17_GF	New Receptor	505816	180211	8.5
17_1	New Receptor	505816	180211	11.6
17_2	New Receptor	505816	180211	14.8

Receptor	Location	X	Y	Height above Ground Level (m)
17_3	New Receptor	505816	180211	17.9
17_4	New Receptor	505816	180211	21.1
17_5	New Receptor	505822	180215	1.5
17_6	New Receptor	505822	180215	5.3
18_GF	New Receptor	505822	180215	8.5
18_1	New Receptor	505822	180215	11.6
18_2	New Receptor	505829	180219	1.5
18_3	New Receptor	505829	180219	5.3
18_4	New Receptor	505829	180219	8.5
18_5	New Receptor	505829	180219	11.6
18_6	New Receptor	505835	180224	1.5
19_GF	New Receptor	505835	180224	5.3
19_1	New Receptor	505835	180224	8.5
19_2	New Receptor	505841	180228	1.5
19_3	New Receptor	505841	180228	5.3
20_GF	New Receptor	505841	180228	8.5
20_1	New Receptor	505849	180216	1.5
20_2	New Receptor	505849	180216	5.3
20_3	New Receptor	505849	180216	8.5
21_GF	New Receptor	505844	180212	1.5
21_1	New Receptor	505844	180212	5.3
21_2	New Receptor	505844	180212	8.5
22_GF	New Receptor	505838	180208	1.5
22_1	New Receptor	505838	180208	5.3
22_2	New Receptor	505838	180208	8.5
23_GF	New Receptor	505838	180208	11.6
23_1	New Receptor	505832	180203	1.5
23_2	New Receptor	505832	180203	5.3
24_GF	New Receptor	505832	180203	8.5
24_1	New Receptor	505832	180203	11.6
24_2	New Receptor	506060	180272	1.5
25_GF	New Receptor	506088	180312	4.5
25_1	New Receptor	506100	180363	4.5
25_2	New Receptor	506082	180379	4.5
25_3	New Receptor	506100	180410	4.5

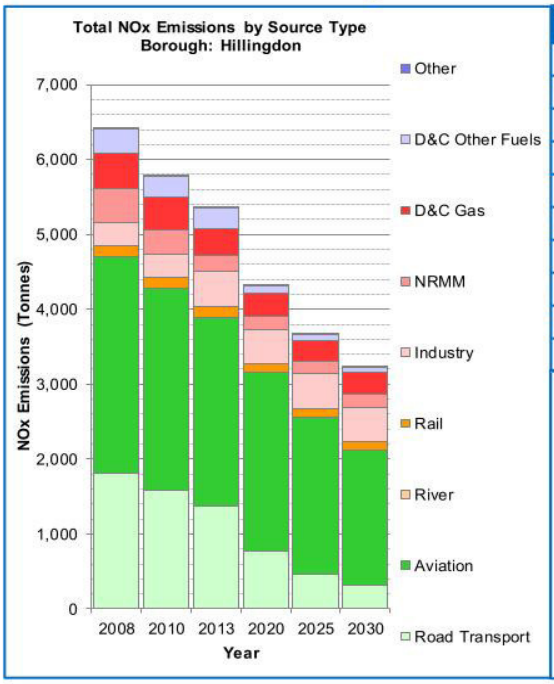
Receptor	Location	X	Y	Height above Ground Level (m)
26_GF	New Receptor	506085	180451	4.5
26_1	New Receptor	506065	180503	4.5
26_2	New Receptor	506031	180527	4.5
26_3	New Receptor	506035	180555	4.5

Appendix G

LONDON BOROUGH OF HILLINGDON – LAEI SOURCE APPORTIONMENT

London Atmospheric Emissions Inventory

NOx Emissions - Hillingdon



Emissions (Tonnes) by	2008	2010	2013	2020	2025	2030
Road Transport	1,818	1,584	1,378	775	468	322
Aviation	2,877	2,692	2,508	2,386	2,093	1,799
River	0	0	0	0	0	0
Rail	157	155	153	107	107	107
Industry	300	300	468	468	468	468
NRMM	454	336	215	174	169	169
D&C Gas	485	431	361	300	284	302
D&C Other Fuels	319	276	268	102	71	58
Other	16	14	11	10	6	10
Total	6,427	5,788	5,363	4,321	3,666	3,235

Notes:

(D&C = Domestic and Commercial)

The summary graph represents emissions from each source stacked on top of one another, with the total stack height equalling the total emissions from all sources.

The numbers in the table are those used to plot the graph and represent the tonnes of pollution emitted into the atmosphere in that year (T/y).

The emissions are combined into reasonably self explanatory "Source Types".

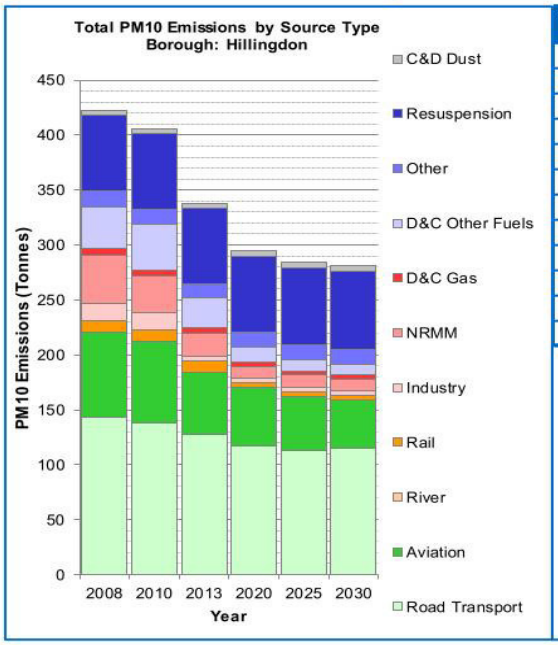
How ever, the categories: "Industry", "NRMM" and "Other" require further explanation:

- **Industry:** is the total emission from Part A and Part B industrial processes, combined.
- **Non-Road Mobile Machinery (NRMM):** is the total emissions from construction and industrial off road machines, combined.
- **Other:** is the total emission from a number of small sources including: agriculture, outdoor fires, garden emissions, forests, waste and waste transfer sites, combined.

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London Atmospheric Emissions Inventory

PM10 Emissions - Hillingdon



Emissions (Tonnes) by	2008	2010	2013	2020	2025	2030
Road Transport	142.9	137.9	127.6	117.2	113.3	114.6
Aviation	78.1	74.8	56.2	53.6	49.2	44.7
River	0.0	0.0	0.0	0.0	0.0	0.0
Rail	10.4	10.3	10.3	3.5	3.5	3.5
Industry	15.0	15.0	4.0	4.0	4.0	4.0
NRMM	44.5	33.5	21.2	11.4	11.4	11.4
D&C Gas	6.3	5.9	5.0	4.1	3.9	4.1
D&C Other Fuels	37.6	41.0	27.8	13.4	10.4	9.1
Other	14.3	13.9	12.7	13.4	13.7	14.0
Resuspension	69.1	69.6	68.5	69.4	70.0	70.6
C&D Dust	3.8	3.6	3.8	5.2	5.2	5.2
Total	422.2	405.6	337.2	295.3	284.6	281.2

Notes:

(D&C = Domestic and Commercial – C&D = Construction and Demolition)

The summary graph represents emissions from each source stacked on top of one another, with the total stack height equalling the total emissions from all sources.

The numbers in the table are those used to plot the graph and represent the tonnes of pollution emitted into the atmosphere in that year (T/y).

The emissions are combined into reasonably self explanatory "Source Types".

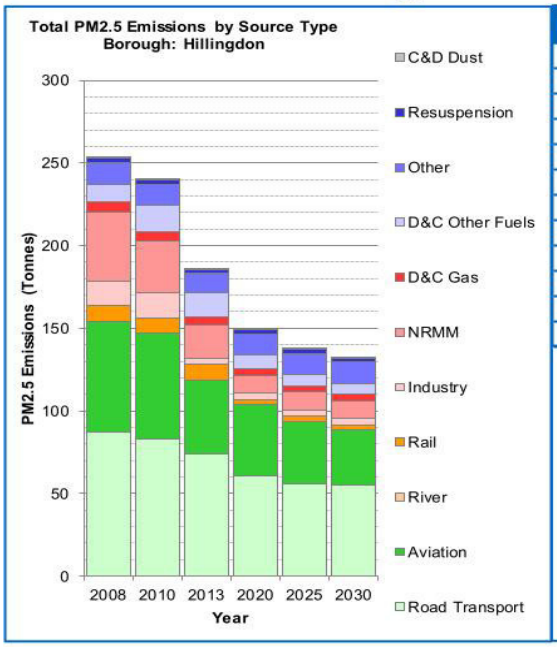
How ever, the categories: "Industry", "NRMM" and "Other" require further explanation:

- **Industry:** is the total emission from Part A and Part B industrial processes, combined.
- **Non-Road Mobile Machinery (NRMM):** is the total emissions from construction and industrial off road machines, combined.
- **Other:** is the total emission from a number of small sources including: agriculture, outdoor fires, garden emissions, forests, waste and waste transfer sites, combined.

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London Atmospheric Emissions Inventory

PM2.5 Emissions - Hillingdon



Emissions (Tonnes) by	2008	2010	2013	2020	2025	2030
Road Transport	87.3	82.7	73.8	61.0	55.5	55.0
Aviation	67.0	64.3	45.0	42.8	38.1	33.4
River	0.0	0.0	0.0	0.0	0.0	0.0
Rail	9.3	9.3	9.2	3.1	3.1	3.1
Industry	15.0	15.0	4.0	4.0	4.0	4.0
NRMM	41.9	31.4	19.9	10.7	10.7	10.7
D&C Gas	6.3	5.9	5.0	4.1	3.9	4.1
D&C Other Fuels	10.3	15.9	14.6	8.4	7.0	6.5
Other	13.1	12.7	11.6	12.2	12.5	12.8
Resuspension	2.5	2.6	2.5	2.6	2.6	2.6
C&D Dust	0.4	0.4	0.4	0.5	0.5	0.5
Total	253.1	240.2	186.0	149.4	137.8	132.6

Notes:

(D&C = Domestic and Commercial – C&D = Construction and Demolition)

The summary graph represents emissions from each source stacked on top of one another, with the total stack height equalling the total emissions from all sources.

The numbers in the table are those used to plot the graph and represent the tonnes of pollution emitted into the atmosphere in that year (T/y).

The emissions are combined into reasonably self explanatory "Source Types".

However, the categories: "Industry", "NRMM" and "Other" require further explanation:

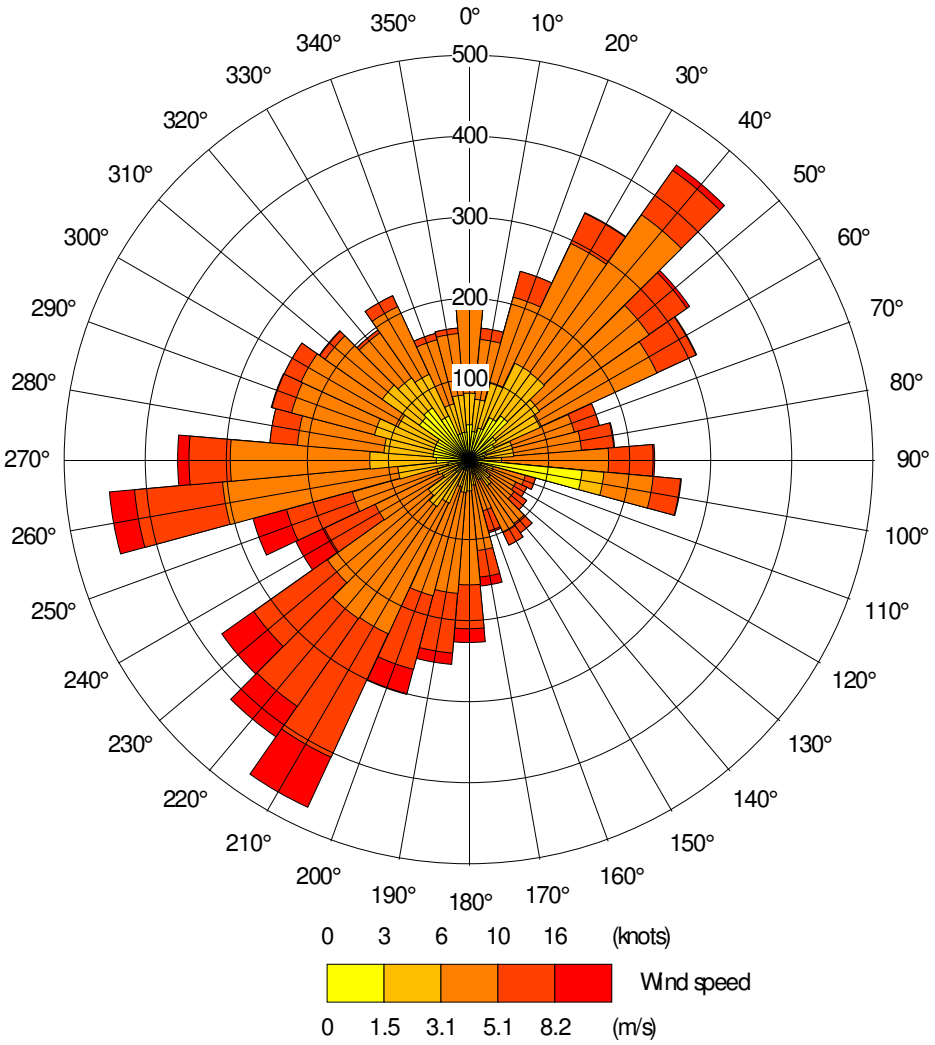
- **Industry:** is the total emission from Part A and Part B industrial processes, combined.
- **Non-Road Mobile Machinery (NRMM):** is the total emissions from construction and industrial off road machines, combined.
- **Other:** is the total emission from a number of small sources including: agriculture, outdoor fires, garden emissions, forests, waste and waste transfer sites, combined.

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Appendix H

WINDROSE – LONDON HEATHROW AIRPORT (2013)

WINDROSE – LONDON HEATHROW AIRPORT (2013)



Appendix I

OPERATIONAL STAGE RESULTS

ANNUAL MEAN NO_2 CONCENTRATIONS (µg/m^3) – 2013 LAEI BASELINE

Receptor ID	Annual Mean NO_2 Concentrations (µg/m^3)				
	2020 Baseline	2020 With Dev	Change (µg/m^3)	% Change Relative to Objective	Impact
E_1	57.5	57.5	0.01	0.0	Negligible
E_2	61.1	61.1	0.01	0.0	Negligible
E_3	39.3	39.3	0.01	0.0	Negligible
E_4	37.2	37.2	0.03	0.0	Negligible
E_5	67.0	67.0	0.02	0.0	Negligible
E_6	55.9	55.9	0.02	0.0	Negligible
E_7	62.2	62.2	0.01	0.0	Negligible
E_8	63.7	63.7	0.01	0.0	Negligible
E_9	49.2	49.2	0.03	0.0	Negligible
E_10	37.0	37.0	0.02	0.0	Negligible
E_11	60.1	60.1	0.01	0.0	Negligible
E_12	45.8	45.8	0.01	0.0	Negligible
E_13	44.7	44.7	0.01	0.0	Negligible
E_14	45.3	45.3	0.01	0.0	Negligible
E_15	57.0	57.0	0.01	0.0	Negligible
E_16	60.3	60.3	0.01	0.0	Negligible
E_17	52.5	52.5	0.01	0.0	Negligible
E_18	37.8	37.8	0.01	0.0	Negligible
E_19	30.9	30.9	0.01	0.0	Negligible
E_20	31.8	31.8	0.02	0.0	Negligible
E_21	30.8	30.8	0.00	0.0	Negligible
E_22	30.4	30.4	0.01	0.0	Negligible
E_23	30.9	30.9	0.01	0.0	Negligible
E_24	32.1	32.1	0.02	0.0	Negligible
1_GF	-	31.9	-	-	APEC A
1_1	-	31.9	-	-	APEC A
1_2	-	31.9	-	-	APEC A
1_3	-	31.9	-	-	APEC A
1_4	-	31.9	-	-	APEC A
1_5	-	31.9	-	-	APEC A
1_6	-	31.9	-	-	APEC A
1_7	-	31.9	-	-	APEC A
1_8	-	32.3	-	-	APEC A

Receptor ID	Annual Mean NO_2 Concentrations (µg/m^3)				
	2020 Baseline	2020 With Dev	Change (µg/m^3)	% Change Relative to Objective	Impact
2_GF	-	31.9	-	-	APEC A
2_1	-	31.9	-	-	APEC A
2_2	-	31.9	-	-	APEC A
2_3	-	31.9	-	-	APEC A
2_4	-	31.9	-	-	APEC A
2_5	-	31.9	-	-	APEC A
2_6	-	31.9	-	-	APEC A
2_7	-	31.9	-	-	APEC A
2_8	-	32.0	-	-	APEC A
3_GF	-	33.6	-	-	APEC A
3_1	-	33.5	-	-	APEC A
3_2	-	33.5	-	-	APEC A
3_3	-	33.5	-	-	APEC A
3_4	-	33.5	-	-	APEC A
3_5	-	33.5	-	-	APEC A
3_6	-	33.5	-	-	APEC A
3_7	-	33.5	-	-	APEC A
3_8	-	33.6	-	-	APEC A
4_GF	-	31.9	-	-	APEC A
4_1	-	31.9	-	-	APEC A
4_2	-	31.9	-	-	APEC A
4_3	-	31.9	-	-	APEC A
4_4	-	31.9	-	-	APEC A
4_5	-	31.9	-	-	APEC A
4_6	-	31.9	-	-	APEC A
4_7	-	31.9	-	-	APEC A
4_8	-	32.2	-	-	APEC A
5_GF	-	31.9	-	-	APEC A
5_1	-	31.9	-	-	APEC A
5_2	-	31.9	-	-	APEC A
5_3	-	31.9	-	-	APEC A
5_4	-	31.9	-	-	APEC A
5_5	-	31.9	-	-	APEC A
5_6	-	31.9	-	-	APEC A

Receptor ID	Annual Mean NO_2 Concentrations (µg/m^3)				
	2020 Baseline	2020 With Dev	Change (µg/m^3)	% Change Relative to Objective	Impact
5_7	-	31.9	-	-	APEC A
6_GF	-	32.3	-	-	APEC A
6_1	-	32.3	-	-	APEC A
6_2	-	32.3	-	-	APEC A
6_3	-	32.3	-	-	APEC A
6_4	-	32.3	-	-	APEC A
6_5	-	32.3	-	-	APEC A
6_6	-	32.3	-	-	APEC A
6_7	-	32.3	-	-	APEC A
7_GF	-	32.3	-	-	APEC A
7_1	-	32.3	-	-	APEC A
7_2	-	32.3	-	-	APEC A
7_3	-	32.3	-	-	APEC A
7_4	-	32.3	-	-	APEC A
7_5	-	32.3	-	-	APEC A
7_6	-	32.3	-	-	APEC A
7_7	-	32.3	-	-	APEC A
8_GF	-	32.3	-	-	APEC A
8_1	-	32.3	-	-	APEC A
8_2	-	32.3	-	-	APEC A
8_3	-	32.3	-	-	APEC A
8_4	-	32.3	-	-	APEC A
8_5	-	32.3	-	-	APEC A
8_6	-	32.3	-	-	APEC A
8_7	-	32.3	-	-	APEC A
9_GF	-	31.4	-	-	APEC A
9_1	-	31.4	-	-	APEC A
9_2	-	31.4	-	-	APEC A
9_3	-	31.4	-	-	APEC A
9_4	-	31.4	-	-	APEC A
9_5	-	31.4	-	-	APEC A
9_6	-	31.4	-	-	APEC A
9_7	-	31.4	-	-	APEC A
10_GF	-	31.4	-	-	APEC A

Receptor ID	Annual Mean NO_2 Concentrations (µg/m^3)				
	2020 Baseline	2020 With Dev	Change (µg/m^3)	% Change Relative to Objective	Impact
10_1	-	31.4	-	-	APEC A
10_2	-	31.4	-	-	APEC A
10_3	-	31.4	-	-	APEC A
10_4	-	31.4	-	-	APEC A
10_5	-	31.4	-	-	APEC A
10_6	-	31.4	-	-	APEC A
10_7	-	31.4	-	-	APEC A
11_GF	-	31.3	-	-	APEC A
11_1	-	31.3	-	-	APEC A
11_2	-	31.3	-	-	APEC A
11_3	-	31.3	-	-	APEC A
11_4	-	31.3	-	-	APEC A
11_5	-	31.3	-	-	APEC A
11_6	-	31.3	-	-	APEC A
11_7	-	31.3	-	-	APEC A
12_GF	-	31.9	-	-	APEC A
12_1	-	31.9	-	-	APEC A
12_2	-	31.9	-	-	APEC A
12_3	-	31.9	-	-	APEC A
12_4	-	31.9	-	-	APEC A
12_5	-	31.9	-	-	APEC A
12_6	-	31.9	-	-	APEC A
12_7	-	31.9	-	-	APEC A
13_GF	-	31.3	-	-	APEC A
13_1	-	31.3	-	-	APEC A
13_2	-	31.3	-	-	APEC A
13_3	-	31.3	-	-	APEC A
13_4	-	31.3	-	-	APEC A
13_5	-	31.3	-	-	APEC A
13_6	-	31.3	-	-	APEC A
14_GF	-	31.3	-	-	APEC A
14_1	-	31.3	-	-	APEC A
14_2	-	31.3	-	-	APEC A
14_3	-	31.3	-	-	APEC A

Receptor ID	Annual Mean NO_2 Concentrations (µg/m^3)				
	2020 Baseline	2020 With Dev	Change (µg/m^3)	% Change Relative to Objective	Impact
14_4	-	31.3	-	-	APEC A
14_5	-	31.3	-	-	APEC A
14_6	-	31.3	-	-	APEC A
15_GF	-	31.3	-	-	APEC A
15_1	-	31.3	-	-	APEC A
15_2	-	31.3	-	-	APEC A
15_3	-	31.3	-	-	APEC A
15_4	-	31.3	-	-	APEC A
15_5	-	31.3	-	-	APEC A
15_6	-	31.3	-	-	APEC A
16_GF	-	31.9	-	-	APEC A
16_1	-	31.9	-	-	APEC A
16_2	-	31.9	-	-	APEC A
16_3	-	31.9	-	-	APEC A
16_4	-	31.9	-	-	APEC A
16_5	-	31.9	-	-	APEC A
16_6	-	31.9	-	-	APEC A
17_GF	-	31.3	-	-	APEC A
17_1	-	31.3	-	-	APEC A
17_2	-	31.3	-	-	APEC A
17_3	-	31.3	-	-	APEC A
17_4	-	31.3	-	-	APEC A
17_5	-	31.3	-	-	APEC A
17_6	-	31.3	-	-	APEC A
18_GF	-	31.4	-	-	APEC A
18_1	-	31.4	-	-	APEC A
18_2	-	31.4	-	-	APEC A
18_3	-	31.4	-	-	APEC A
18_4	-	31.4	-	-	APEC A
18_5	-	31.4	-	-	APEC A
18_6	-	31.4	-	-	APEC A
19_GF	-	31.4	-	-	APEC A
19_1	-	31.4	-	-	APEC A
19_2	-	31.4	-	-	APEC A

Receptor ID	Annual Mean NO_2 Concentrations (µg/m^3)				
	2020 Baseline	2020 With Dev	Change (µg/m^3)	% Change Relative to Objective	Impact
19_3	-	31.4	-	-	APEC A
20_GF	-	31.4	-	-	APEC A
20_1	-	31.4	-	-	APEC A
20_2	-	31.4	-	-	APEC A
20_3	-	31.4	-	-	APEC A
21_GF	-	31.4	-	-	APEC A
21_1	-	31.4	-	-	APEC A
21_2	-	31.4	-	-	APEC A
22_GF	-	31.4	-	-	APEC A
22_1	-	31.4	-	-	APEC A
22_2	-	31.4	-	-	APEC A
23_GF	-	31.4	-	-	APEC A
23_1	-	31.4	-	-	APEC A
23_2	-	31.4	-	-	APEC A
24_GF	-	31.4	-	-	APEC A
24_1	-	31.4	-	-	APEC A
24_2	-	31.4	-	-	APEC A
25_GF	-	31.4	-	-	APEC A
25_1	-	31.4	-	-	APEC A
25_2	-	31.4	-	-	APEC A
25_3	-	31.4	-	-	APEC A
26_GF	-	31.4	-	-	APEC A
26_1	-	31.4	-	-	APEC A
26_2	-	31.4	-	-	APEC A
26_3	-	31.4	-	-	APEC A

ANNUAL MEAN PM_{10} CONCENTRATIONS (µg/m^3) – 2013 LAEI BASELINE

Receptor ID	Annual Mean PM_{10} Concentrations (µg/m^3)				
	2020 Baseline	2020 With Dev	Change (µg/m^3)	% Change Relative to Objective	Impact
E_1	28.9	28.9	0.00	0.0	Negligible
E_2	29.8	29.8	0.00	0.0	Negligible
E_3	25.3	25.3	0.00	0.0	Negligible
E_4	24.9	24.9	0.00	0.0	Negligible
E_5	31.0	31.0	0.00	0.0	Negligible
E_6	28.6	28.6	0.00	0.0	Negligible
E_7	30.0	30.0	0.00	0.0	Negligible
E_8	30.4	30.4	0.00	0.0	Negligible
E_9	27.3	27.3	0.01	0.0	Negligible
E_10	24.9	24.9	0.00	0.0	Negligible
E_11	29.5	29.5	0.00	0.0	Negligible
E_12	26.6	26.6	0.00	0.0	Negligible
E_13	26.4	26.4	0.00	0.0	Negligible
E_14	26.5	26.5	0.00	0.0	Negligible
E_15	28.9	28.9	0.00	0.0	Negligible
E_16	29.8	29.8	0.00	0.0	Negligible
E_17	28.2	28.2	0.00	0.0	Negligible
E_18	25.1	25.1	0.00	0.0	Negligible
E_19	28.8	28.8	0.00	0.0	Negligible
E_20	23.9	23.9	0.00	0.0	Negligible
E_21	23.8	23.8	0.00	0.0	Negligible
E_22	23.7	23.7	0.00	0.0	Negligible
E_23	23.8	23.8	0.00	0.0	Negligible
E_24	24.0	24.0	0.00	0.0	Negligible
1_GF	-	23.9	-	-	APEC A
1_1	-	23.9	-	-	APEC A
1_2	-	23.9	-	-	APEC A
1_3	-	23.9	-	-	APEC A
1_4	-	23.9	-	-	APEC A
1_5	-	23.9	-	-	APEC A
1_6	-	23.9	-	-	APEC A
1_7	-	23.9	-	-	APEC A
1_8	-	23.9	-	-	APEC A

Receptor ID	Annual Mean PM_{10} Concentrations ($\mu g/m^3$)				
	2020 Baseline	2020 With Dev	Change ($\mu g/m^3$)	% Change Relative to Objective	Impact
2_GF	-	23.9	-	-	APEC A
2_1	-	23.9	-	-	APEC A
2_2	-	23.9	-	-	APEC A
2_3	-	23.9	-	-	APEC A
2_4	-	23.9	-	-	APEC A
2_5	-	23.9	-	-	APEC A
2_6	-	23.9	-	-	APEC A
2_7	-	23.9	-	-	APEC A
2_8	-	23.9	-	-	APEC A
3_GF	-	24.2	-	-	APEC A
3_1	-	24.2	-	-	APEC A
3_2	-	24.2	-	-	APEC A
3_3	-	24.2	-	-	APEC A
3_4	-	24.2	-	-	APEC A
3_5	-	24.2	-	-	APEC A
3_6	-	24.2	-	-	APEC A
3_7	-	24.2	-	-	APEC A
3_8	-	24.2	-	-	APEC A
4_GF	-	23.9	-	-	APEC A
4_1	-	23.9	-	-	APEC A
4_2	-	23.9	-	-	APEC A
4_3	-	23.9	-	-	APEC A
4_4	-	23.9	-	-	APEC A
4_5	-	23.9	-	-	APEC A
4_6	-	23.9	-	-	APEC A
4_7	-	23.9	-	-	APEC A
4_8	-	23.9	-	-	APEC A
5_GF	-	23.9	-	-	APEC A
5_1	-	23.9	-	-	APEC A
5_2	-	23.9	-	-	APEC A
5_3	-	23.9	-	-	APEC A
5_4	-	23.9	-	-	APEC A
5_5	-	23.9	-	-	APEC A
5_6	-	23.9	-	-	APEC A

Receptor ID	Annual Mean PM_{10} Concentrations (µg/m^3)				
	2020 Baseline	2020 With Dev	Change (µg/m^3)	% Change Relative to Objective	Impact
5_7	-	23.9	-	-	APEC A
6_GF	-	23.9	-	-	APEC A
6_1	-	23.9	-	-	APEC A
6_2	-	23.9	-	-	APEC A
6_3	-	23.9	-	-	APEC A
6_4	-	23.9	-	-	APEC A
6_5	-	23.9	-	-	APEC A
6_6	-	23.9	-	-	APEC A
6_7	-	23.9	-	-	APEC A
7_GF	-	23.9	-	-	APEC A
7_1	-	23.9	-	-	APEC A
7_2	-	23.9	-	-	APEC A
7_3	-	23.9	-	-	APEC A
7_4	-	23.9	-	-	APEC A
7_5	-	23.9	-	-	APEC A
7_6	-	23.9	-	-	APEC A
7_7	-	23.9	-	-	APEC A
8_GF	-	23.9	-	-	APEC A
8_1	-	23.9	-	-	APEC A
8_2	-	23.9	-	-	APEC A
8_3	-	23.9	-	-	APEC A
8_4	-	23.9	-	-	APEC A
8_5	-	23.9	-	-	APEC A
8_6	-	23.9	-	-	APEC A
8_7	-	23.9	-	-	APEC A
9_GF	-	23.8	-	-	APEC A
9_1	-	23.8	-	-	APEC A
9_2	-	23.8	-	-	APEC A
9_3	-	23.8	-	-	APEC A
9_4	-	23.8	-	-	APEC A
9_5	-	23.8	-	-	APEC A
9_6	-	23.8	-	-	APEC A
9_7	-	23.8	-	-	APEC A
10_GF	-	23.8	-	-	APEC A

Receptor ID	Annual Mean PM_{10} Concentrations (µg/m^3)				
	2020 Baseline	2020 With Dev	Change (µg/m^3)	% Change Relative to Objective	Impact
10_1	-	23.8	-	-	APEC A
10_2	-	23.8	-	-	APEC A
10_3	-	23.8	-	-	APEC A
10_4	-	23.8	-	-	APEC A
10_5	-	23.8	-	-	APEC A
10_6	-	23.8	-	-	APEC A
10_7	-	23.8	-	-	APEC A
11_GF	-	23.8	-	-	APEC A
11_1	-	23.8	-	-	APEC A
11_2	-	23.8	-	-	APEC A
11_3	-	23.8	-	-	APEC A
11_4	-	23.8	-	-	APEC A
11_5	-	23.8	-	-	APEC A
11_6	-	23.8	-	-	APEC A
11_7	-	23.8	-	-	APEC A
12_GF	-	23.9	-	-	APEC A
12_1	-	23.9	-	-	APEC A
12_2	-	23.9	-	-	APEC A
12_3	-	23.9	-	-	APEC A
12_4	-	23.9	-	-	APEC A
12_5	-	23.9	-	-	APEC A
12_6	-	23.9	-	-	APEC A
12_7	-	23.9	-	-	APEC A
13_GF	-	23.8	-	-	APEC A
13_1	-	23.8	-	-	APEC A
13_2	-	23.8	-	-	APEC A
13_3	-	23.8	-	-	APEC A
13_4	-	23.8	-	-	APEC A
13_5	-	23.8	-	-	APEC A
13_6	-	23.8	-	-	APEC A
14_GF	-	23.8	-	-	APEC A
14_1	-	23.8	-	-	APEC A
14_2	-	23.8	-	-	APEC A
14_3	-	23.8	-	-	APEC A

Receptor ID	Annual Mean PM_{10} Concentrations ($\mu g/m^3$)				
	2020 Baseline	2020 With Dev	Change ($\mu g/m^3$)	% Change Relative to Objective	Impact
14_4	-	23.8	-	-	APEC A
14_5	-	23.8	-	-	APEC A
14_6	-	23.8	-	-	APEC A
15_GF	-	23.8	-	-	APEC A
15_1	-	23.8	-	-	APEC A
15_2	-	23.8	-	-	APEC A
15_3	-	23.8	-	-	APEC A
15_4	-	23.8	-	-	APEC A
15_5	-	23.8	-	-	APEC A
15_6	-	23.8	-	-	APEC A
16_GF	-	23.9	-	-	APEC A
16_1	-	23.9	-	-	APEC A
16_2	-	23.9	-	-	APEC A
16_3	-	23.9	-	-	APEC A
16_4	-	23.9	-	-	APEC A
16_5	-	23.9	-	-	APEC A
16_6	-	23.9	-	-	APEC A
17_GF	-	23.8	-	-	APEC A
17_1	-	23.8	-	-	APEC A
17_2	-	23.8	-	-	APEC A
17_3	-	23.8	-	-	APEC A
17_4	-	23.8	-	-	APEC A
17_5	-	23.8	-	-	APEC A
17_6	-	23.8	-	-	APEC A
18_GF	-	23.9	-	-	APEC A
18_1	-	23.9	-	-	APEC A
18_2	-	23.9	-	-	APEC A
18_3	-	23.9	-	-	APEC A
18_4	-	23.9	-	-	APEC A
18_5	-	23.9	-	-	APEC A
18_6	-	23.9	-	-	APEC A
19_GF	-	23.9	-	-	APEC A
19_1	-	23.9	-	-	APEC A
19_2	-	23.9	-	-	APEC A

Receptor ID	Annual Mean PM_{10} Concentrations (µg/m^3)				
	2020 Baseline	2020 With Dev	Change (µg/m^3)	% Change Relative to Objective	Impact
19_3	-	23.9	-	-	APEC A
20_GF	-	23.9	-	-	APEC A
20_1	-	23.9	-	-	APEC A
20_2	-	23.9	-	-	APEC A
20_3	-	23.9	-	-	APEC A
21_GF	-	23.8	-	-	APEC A
21_1	-	23.8	-	-	APEC A
21_2	-	23.8	-	-	APEC A
22_GF	-	23.8	-	-	APEC A
22_1	-	23.8	-	-	APEC A
22_2	-	23.8	-	-	APEC A
23_GF	-	23.8	-	-	APEC A
23_1	-	23.8	-	-	APEC A
23_2	-	23.8	-	-	APEC A
24_GF	-	23.8	-	-	APEC A
24_1	-	23.8	-	-	APEC A
24_2	-	23.8	-	-	APEC A
25_GF	-	23.8	-	-	APEC A
25_1	-	23.8	-	-	APEC A
25_2	-	23.8	-	-	APEC A
25_3	-	23.8	-	-	APEC A
26_GF	-	23.8	-	-	APEC A
26_1	-	23.8	-	-	APEC A
26_2	-	23.8	-	-	APEC A
26_3	-	23.8	-	-	APEC A

DAILY MEAN PM_{10} (NO. OF DAYS OF EXCEEDANCE) – 2013 LAEI BASELINE

Receptor ID	Days with PM_{10} Concentrations >50µg/m^3			
	2020 Baseline	2020 With Dev	Change (days)	Impact
E_1	24	24	0	Negligible
E_2	27	27	0	Negligible
E_3	13	13	0	Negligible
E_4	12	12	0	Negligible
E_5	31	31	0	Negligible
E_6	23	23	0	Negligible
E_7	28	28	0	Negligible
E_8	29	29	0	Negligible
E_9	19	19	0	Negligible
E_10	12	12	0	Negligible
E_11	26	26	0	Negligible
E_12	17	17	0	Negligible
E_13	16	16	0	Negligible
E_14	16	16	0	Negligible
E_15	24	24	0	Negligible
E_16	27	27	0	Negligible
E_17	21	21	0	Negligible
E_18	13	13	0	Negligible
E_19	23	23	0	Negligible
E_20	10	10	0	Negligible
E_21	10	10	0	Negligible
E_22	9	9	0	Negligible
E_23	10	10	0	Negligible
E_24	10	10	0	Negligible
1_GF	-	10	-	-
1_1	-	10	-	-
1_2	-	10	-	-
1_3	-	10	-	-
1_4	-	10	-	-
1_5	-	10	-	-
1_6	-	10	-	-
1_7	-	10	-	-
1_8	-	10	-	-
2_GF	-	10	-	-

Receptor ID	Days with PM_{10} Concentrations >50µg/m^3			
	2020 Baseline	2020 With Dev	Change (days)	Impact
2_1	-	10	-	-
2_2	-	10	-	-
2_3	-	10	-	-
2_4	-	10	-	-
2_5	-	10	-	-
2_6	-	10	-	-
2_7	-	10	-	-
2_8	-	10	-	-
3_GF	-	11	-	-
3_1	-	11	-	-
3_2	-	11	-	-
3_3	-	11	-	-
3_4	-	11	-	-
3_5	-	11	-	-
3_6	-	11	-	-
3_7	-	11	-	-
3_8	-	11	-	-
4_GF	-	10	-	-
4_1	-	10	-	-
4_2	-	10	-	-
4_3	-	10	-	-
4_4	-	10	-	-
4_5	-	10	-	-
4_6	-	10	-	-
4_7	-	10	-	-
4_8	-	10	-	-
5_GF	-	10	-	-
5_1	-	10	-	-
5_2	-	10	-	-
5_3	-	10	-	-
5_4	-	10	-	-
5_5	-	10	-	-
5_6	-	10	-	-
5_7	-	10	-	-
6_GF	-	10	-	-

Receptor ID	Days with PM_{10} Concentrations >50µg/m^3			
	2020 Baseline	2020 With Dev	Change (days)	Impact
6_1	-	10	-	-
6_2	-	10	-	-
6_3	-	10	-	-
6_4	-	10	-	-
6_5	-	10	-	-
6_6	-	10	-	-
6_7	-	10	-	-
7_GF	-	10	-	-
7_1	-	10	-	-
7_2	-	10	-	-
7_3	-	10	-	-
7_4	-	10	-	-
7_5	-	10	-	-
7_6	-	10	-	-
7_7	-	10	-	-
8_GF	-	10	-	-
8_1	-	10	-	-
8_2	-	10	-	-
8_3	-	10	-	-
8_4	-	10	-	-
8_5	-	10	-	-
8_6	-	10	-	-
8_7	-	10	-	-
9_GF	-	10	-	-
9_1	-	10	-	-
9_2	-	10	-	-
9_3	-	10	-	-
9_4	-	10	-	-
9_5	-	10	-	-
9_6	-	10	-	-
9_7	-	10	-	-
10_GF	-	10	-	-
10_1	-	10	-	-
10_2	-	10	-	-
10_3	-	10	-	-

Receptor ID	Days with PM_{10} Concentrations >50µg/m^3			
	2020 Baseline	2020 With Dev	Change (days)	Impact
10_4	-	10	-	-
10_5	-	10	-	-
10_6	-	10	-	-
10_7	-	10	-	-
11_GF	-	10	-	-
11_1	-	10	-	-
11_2	-	10	-	-
11_3	-	10	-	-
11_4	-	10	-	-
11_5	-	10	-	-
11_6	-	10	-	-
11_7	-	10	-	-
12_GF	-	10	-	-
12_1	-	10	-	-
12_2	-	10	-	-
12_3	-	10	-	-
12_4	-	10	-	-
12_5	-	10	-	-
12_6	-	10	-	-
12_7	-	10	-	-
13_GF	-	10	-	-
13_1	-	10	-	-
13_2	-	10	-	-
13_3	-	10	-	-
13_4	-	10	-	-
13_5	-	10	-	-
13_6	-	10	-	-
14_GF	-	10	-	-
14_1	-	10	-	-
14_2	-	10	-	-
14_3	-	10	-	-
14_4	-	10	-	-
14_5	-	10	-	-
14_6	-	10	-	-
15_GF	-	10	-	-

Receptor ID	Days with PM_{10} Concentrations >50µg/m^3			
	2020 Baseline	2020 With Dev	Change (days)	Impact
15_1	-	10	-	-
15_2	-	10	-	-
15_3	-	10	-	-
15_4	-	10	-	-
15_5	-	10	-	-
15_6	-	10	-	-
16_GF	-	10	-	-
16_1	-	10	-	-
16_2	-	10	-	-
16_3	-	10	-	-
16_4	-	10	-	-
16_5	-	10	-	-
16_6	-	10	-	-
17_GF	-	10	-	-
17_1	-	10	-	-
17_2	-	10	-	-
17_3	-	10	-	-
17_4	-	10	-	-
17_5	-	10	-	-
17_6	-	10	-	-
18_GF	-	10	-	-
18_1	-	10	-	-
18_2	-	10	-	-
18_3	-	10	-	-
18_4	-	10	-	-
18_5	-	10	-	-
18_6	-	10	-	-
19_GF	-	10	-	-
19_1	-	10	-	-
19_2	-	10	-	-
19_3	-	10	-	-
20_GF	-	10	-	-
20_1	-	10	-	-
20_2	-	10	-	-
20_3	-	10	-	-

Receptor ID	Days with PM_{10} Concentrations >50µg/m^3			
	2020 Baseline	2020 With Dev	Change (days)	Impact
21_GF	-	10	-	-
21_1	-	10	-	-
21_2	-	10	-	-
22_GF	-	10	-	-
22_1	-	10	-	-
22_2	-	10	-	-
23_GF	-	10	-	-
23_1	-	10	-	-
23_2	-	10	-	-
24_GF	-	10	-	-
24_1	-	10	-	-
24_2	-	10	-	-
25_GF	-	10	-	-
25_1	-	10	-	-
25_2	-	10	-	-
25_3	-	10	-	-
26_GF	-	10	-	-
26_1	-	10	-	-
26_2	-	10	-	-
26_3	-	10	-	-

ANNUAL MEAN $PM_{2.5}$ CONCENTRATIONS (µg/m^3) – 2013 BASELINE

Receptor ID	Annual Mean $PM_{2.5}$ Concentrations (µg/m^3)				
	2020 Baseline	2020 With Dev	Change (µg/m^3)	% Change Relative to Objective	Impact
E_1	17.4	17.4	0.00	0.0	Negligible
E_2	17.7	17.7	0.00	0.0	Negligible
E_3	16.2	16.2	0.00	0.0	Negligible
E_4	16.0	16.0	0.00	0.0	Negligible
E_5	18.3	18.3	0.00	0.0	Negligible
E_6	17.3	17.3	0.00	0.0	Negligible
E_7	17.7	17.7	0.00	0.0	Negligible
E_8	17.8	17.8	0.00	0.0	Negligible
E_9	16.6	16.6	0.00	0.0	Negligible
E_10	15.7	15.7	0.00	0.0	Negligible
E_11	17.4	17.4	0.00	0.0	Negligible
E_12	16.3	16.3	0.00	0.0	Negligible
E_13	16.2	16.2	0.00	0.0	Negligible
E_14	16.2	16.2	0.00	0.0	Negligible
E_15	17.1	17.1	0.00	0.0	Negligible
E_16	17.4	17.4	0.00	0.0	Negligible
E_17	16.8	16.8	0.00	0.0	Negligible
E_18	15.7	15.7	0.00	0.0	Negligible
E_19	15.3	15.3	0.00	0.0	Negligible
E_20	15.4	15.4	0.00	0.0	Negligible
E_21	15.3	15.3	0.00	0.0	Negligible
E_22	15.2	15.2	0.00	0.0	Negligible
E_23	15.3	15.3	0.00	0.0	Negligible
E_24	15.5	15.5	0.00	0.0	Negligible
1_GF	-	15.5	-	-	-
1_1	-	15.5	-	-	-
1_2	-	15.5	-	-	-
1_3	-	15.5	-	-	-
1_4	-	15.5	-	-	-
1_5	-	15.5	-	-	-
1_6	-	15.5	-	-	-
1_7	-	15.5	-	-	-
1_8	-	15.5	-	-	-

Receptor ID	Annual Mean $PM_{2.5}$ Concentrations (µg/m^3)				
	2020 Baseline	2020 With Dev	Change (µg/m^3)	% Change Relative to Objective	Impact
2_GF	-	15.5	-	-	-
2_1	-	15.5	-	-	-
2_2	-	15.5	-	-	-
2_3	-	15.5	-	-	-
2_4	-	15.5	-	-	-
2_5	-	15.5	-	-	-
2_6	-	15.5	-	-	-
2_7	-	15.5	-	-	-
2_8	-	15.5	-	-	-
3_GF	-	15.7	-	-	-
3_1	-	15.7	-	-	-
3_2	-	15.7	-	-	-
3_3	-	15.7	-	-	-
3_4	-	15.7	-	-	-
3_5	-	15.7	-	-	-
3_6	-	15.7	-	-	-
3_7	-	15.7	-	-	-
3_8	-	15.7	-	-	-
4_GF	-	15.5	-	-	-
4_1	-	15.5	-	-	-
4_2	-	15.5	-	-	-
4_3	-	15.5	-	-	-
4_4	-	15.5	-	-	-
4_5	-	15.5	-	-	-
4_6	-	15.5	-	-	-
4_7	-	15.5	-	-	-
4_8	-	15.5	-	-	-
5_GF	-	15.5	-	-	-
5_1	-	15.5	-	-	-
5_2	-	15.5	-	-	-
5_3	-	15.5	-	-	-
5_4	-	15.5	-	-	-
5_5	-	15.5	-	-	-
5_6	-	15.5	-	-	-

Receptor ID	Annual Mean $PM_{2.5}$ Concentrations (µg/m^3)				
	2020 Baseline	2020 With Dev	Change (µg/m^3)	% Change Relative to Objective	Impact
5_7	-	15.5	-	-	-
6_GF	-	15.5	-	-	-
6_1	-	15.5	-	-	-
6_2	-	15.5	-	-	-
6_3	-	15.5	-	-	-
6_4	-	15.5	-	-	-
6_5	-	15.5	-	-	-
6_6	-	15.5	-	-	-
6_7	-	15.5	-	-	-
7_GF	-	15.5	-	-	-
7_1	-	15.5	-	-	-
7_2	-	15.5	-	-	-
7_3	-	15.5	-	-	-
7_4	-	15.5	-	-	-
7_5	-	15.5	-	-	-
7_6	-	15.5	-	-	-
7_7	-	15.5	-	-	-
8_GF	-	15.5	-	-	-
8_1	-	15.5	-	-	-
8_2	-	15.5	-	-	-
8_3	-	15.5	-	-	-
8_4	-	15.5	-	-	-
8_5	-	15.5	-	-	-
8_6	-	15.5	-	-	-
8_7	-	15.5	-	-	-
9_GF	-	15.4	-	-	-
9_1	-	15.4	-	-	-
9_2	-	15.4	-	-	-
9_3	-	15.4	-	-	-
9_4	-	15.4	-	-	-
9_5	-	15.4	-	-	-
9_6	-	15.4	-	-	-
9_7	-	15.4	-	-	-
10_GF	-	15.4	-	-	-

Receptor ID	Annual Mean $PM_{2.5}$ Concentrations (µg/m^3)				
	2020 Baseline	2020 With Dev	Change (µg/m^3)	% Change Relative to Objective	Impact
10_1	-	15.4	-	-	-
10_2	-	15.4	-	-	-
10_3	-	15.4	-	-	-
10_4	-	15.4	-	-	-
10_5	-	15.4	-	-	-
10_6	-	15.4	-	-	-
10_7	-	15.4	-	-	-
11_GF	-	15.4	-	-	-
11_1	-	15.4	-	-	-
11_2	-	15.4	-	-	-
11_3	-	15.4	-	-	-
11_4	-	15.4	-	-	-
11_5	-	15.4	-	-	-
11_6	-	15.4	-	-	-
11_7	-	15.4	-	-	-
12_GF	-	15.5	-	-	-
12_1	-	15.5	-	-	-
12_2	-	15.5	-	-	-
12_3	-	15.5	-	-	-
12_4	-	15.5	-	-	-
12_5	-	15.5	-	-	-
12_6	-	15.5	-	-	-
12_7	-	15.5	-	-	-
13_GF	-	15.4	-	-	-
13_1	-	15.4	-	-	-
13_2	-	15.4	-	-	-
13_3	-	15.4	-	-	-
13_4	-	15.4	-	-	-
13_5	-	15.4	-	-	-
13_6	-	15.4	-	-	-
14_GF	-	15.4	-	-	-
14_1	-	15.4	-	-	-
14_2	-	15.4	-	-	-
14_3	-	15.4	-	-	-

Receptor ID	Annual Mean $PM_{2.5}$ Concentrations (µg/m^3)				
	2020 Baseline	2020 With Dev	Change (µg/m^3)	% Change Relative to Objective	Impact
14_4	-	15.4	-	-	-
14_5	-	15.4	-	-	-
14_6	-	15.4	-	-	-
15_GF	-	15.4	-	-	-
15_1	-	15.4	-	-	-
15_2	-	15.4	-	-	-
15_3	-	15.4	-	-	-
15_4	-	15.4	-	-	-
15_5	-	15.4	-	-	-
15_6	-	15.4	-	-	-
16_GF	-	15.4	-	-	-
16_1	-	15.4	-	-	-
16_2	-	15.4	-	-	-
16_3	-	15.4	-	-	-
16_4	-	15.4	-	-	-
16_5	-	15.4	-	-	-
16_6	-	15.4	-	-	-
17_GF	-	15.4	-	-	-
17_1	-	15.4	-	-	-
17_2	-	15.4	-	-	-
17_3	-	15.4	-	-	-
17_4	-	15.4	-	-	-
17_5	-	15.4	-	-	-
17_6	-	15.4	-	-	-
18_GF	-	15.4	-	-	-
18_1	-	15.4	-	-	-
18_2	-	15.4	-	-	-
18_3	-	15.4	-	-	-
18_4	-	15.4	-	-	-
18_5	-	15.4	-	-	-
18_6	-	15.4	-	-	-
19_GF	-	15.4	-	-	-
19_1	-	15.4	-	-	-
19_2	-	15.4	-	-	-

Receptor ID	Annual Mean $PM_{2.5}$ Concentrations (µg/m^3)				
	2020 Baseline	2020 With Dev	Change (µg/m^3)	% Change Relative to Objective	Impact
19_3	-	15.4	-	-	-
20_GF	-	15.4	-	-	-
20_1	-	15.4	-	-	-
20_2	-	15.4	-	-	-
20_3	-	15.4	-	-	-
21_GF	-	15.3	-	-	-
21_1	-	15.3	-	-	-
21_2	-	15.3	-	-	-
22_GF	-	15.3	-	-	-
22_1	-	15.3	-	-	-
22_2	-	15.3	-	-	-
23_GF	-	15.3	-	-	-
23_1	-	15.3	-	-	-
23_2	-	15.3	-	-	-
24_GF	-	15.3	-	-	-
24_1	-	15.3	-	-	-
24_2	-	15.3	-	-	-
25_GF	-	15.4	-	-	-
25_1	-	15.4	-	-	-
25_2	-	15.4	-	-	-
25_3	-	15.4	-	-	-
26_GF	-	15.4	-	-	-
26_1	-	15.4	-	-	-
26_2	-	15.4	-	-	-
26_3	-	15.4	-	-	-

Appendix J

OPERATIONAL STAGE RESULTS – SENSITIVITY TEST

ANNUAL MEAN NO_2 CONCENTRATIONS ($\mu g/m^3$) – 2020 BASELINE

Receptor ID	Annual Mean NO_2 Concentrations ($\mu g/m^3$)				
	2020 Baseline	2020 With Dev	Change ($\mu g/m^3$)	% Change Relative to Objective	Impact
E_1	46.5	46.5	0.01	0.0	Negligible
E_2	49.3	49.3	0.01	0.0	Negligible
E_3	31.4	31.4	0.02	0.0	Negligible
E_4	29.7	29.7	0.03	0.0	Negligible
E_5	54.0	54.0	0.02	0.0	Negligible
E_6	45.3	45.3	0.02	0.0	Negligible
E_7	50.8	50.8	0.02	0.0	Negligible
E_8	52.1	52.1	0.01	0.0	Negligible
E_9	40.1	40.1	0.04	0.0	Negligible
E_10	30.5	30.5	0.02	0.0	Negligible
E_11	49.4	49.4	0.01	0.0	Negligible
E_12	37.6	37.6	0.01	0.0	Negligible
E_13	36.7	36.7	0.01	0.0	Negligible
E_14	37.2	37.2	0.01	0.0	Negligible
E_15	46.9	46.9	0.01	0.0	Negligible
E_16	50.2	50.2	0.01	0.0	Negligible
E_17	43.4	43.4	0.01	0.0	Negligible
E_18	31.4	31.4	0.01	0.0	Negligible
E_19	25.5	25.5	0.02	0.0	Negligible
E_20	26.1	26.1	0.02	0.0	Negligible
E_21	25.7	25.7	0.01	0.0	Negligible
E_22	24.5	24.5	0.01	0.0	Negligible
E_23	25.6	25.6	0.01	0.0	Negligible
E_24	26.4	26.4	0.02	0.0	Negligible
1_GF	-	26.2	-	-	APEC A
1_1	-	26.2	-	-	APEC A
1_2	-	26.2	-	-	APEC A
1_3	-	26.2	-	-	APEC A
1_4	-	26.2	-	-	APEC A
1_5	-	26.2	-	-	APEC A
1_6	-	26.2	-	-	APEC A
1_7	-	26.2	-	-	APEC A
1_8	-	26.6	-	-	APEC A

Receptor ID	Annual Mean NO_2 Concentrations (µg/m^3)				
	2020 Baseline	2020 With Dev	Change (µg/m^3)	% Change Relative to Objective	Impact
2_GF	-	26.2	-	-	APEC A
2_1	-	26.2	-	-	APEC A
2_2	-	26.2	-	-	APEC A
2_3	-	26.2	-	-	APEC A
2_4	-	26.2	-	-	APEC A
2_5	-	26.2	-	-	APEC A
2_6	-	26.2	-	-	APEC A
2_7	-	26.2	-	-	APEC A
2_8	-	26.3	-	-	APEC A
3_GF	-	27.4	-	-	APEC A
3_1	-	27.4	-	-	APEC A
3_2	-	27.3	-	-	APEC A
3_3	-	27.3	-	-	APEC A
3_4	-	27.3	-	-	APEC A
3_5	-	27.3	-	-	APEC A
3_6	-	27.3	-	-	APEC A
3_7	-	27.3	-	-	APEC A
3_8	-	27.4	-	-	APEC A
4_GF	-	26.2	-	-	APEC A
4_1	-	26.2	-	-	APEC A
4_2	-	26.2	-	-	APEC A
4_3	-	26.2	-	-	APEC A
4_4	-	26.2	-	-	APEC A
4_5	-	26.2	-	-	APEC A
4_6	-	26.2	-	-	APEC A
4_7	-	26.2	-	-	APEC A
4_8	-	26.5	-	-	APEC A
5_GF	-	26.2	-	-	APEC A
5_1	-	26.2	-	-	APEC A
5_2	-	26.2	-	-	APEC A
5_3	-	26.2	-	-	APEC A
5_4	-	26.2	-	-	APEC A
5_5	-	26.2	-	-	APEC A
5_6	-	26.2	-	-	APEC A

Receptor ID	Annual Mean NO_2 Concentrations (µg/m^3)				
	2020 Baseline	2020 With Dev	Change (µg/m^3)	% Change Relative to Objective	Impact
5_7	-	26.2	-	-	APEC A
6_GF	-	26.5	-	-	APEC A
6_1	-	26.5	-	-	APEC A
6_2	-	26.5	-	-	APEC A
6_3	-	26.5	-	-	APEC A
6_4	-	26.5	-	-	APEC A
6_5	-	26.5	-	-	APEC A
6_6	-	26.5	-	-	APEC A
6_7	-	26.5	-	-	APEC A
7_GF	-	26.5	-	-	APEC A
7_1	-	26.5	-	-	APEC A
7_2	-	26.5	-	-	APEC A
7_3	-	26.5	-	-	APEC A
7_4	-	26.5	-	-	APEC A
7_5	-	26.5	-	-	APEC A
7_6	-	26.5	-	-	APEC A
7_7	-	26.5	-	-	APEC A
8_GF	-	26.5	-	-	APEC A
8_1	-	26.5	-	-	APEC A
8_2	-	26.5	-	-	APEC A
8_3	-	26.5	-	-	APEC A
8_4	-	26.5	-	-	APEC A
8_5	-	26.5	-	-	APEC A
8_6	-	26.5	-	-	APEC A
8_7	-	26.5	-	-	APEC A
9_GF	-	25.9	-	-	APEC A
9_1	-	25.9	-	-	APEC A
9_2	-	25.9	-	-	APEC A
9_3	-	25.9	-	-	APEC A
9_4	-	25.9	-	-	APEC A
9_5	-	25.9	-	-	APEC A
9_6	-	25.9	-	-	APEC A
9_7	-	25.9	-	-	APEC A
10_GF	-	25.9	-	-	APEC A

Receptor ID	Annual Mean NO_2 Concentrations (µg/m^3)				
	2020 Baseline	2020 With Dev	Change (µg/m^3)	% Change Relative to Objective	Impact
10_1	-	25.9	-	-	APEC A
10_2	-	25.9	-	-	APEC A
10_3	-	25.9	-	-	APEC A
10_4	-	25.9	-	-	APEC A
10_5	-	25.9	-	-	APEC A
10_6	-	25.9	-	-	APEC A
10_7	-	25.9	-	-	APEC A
11_GF	-	25.8	-	-	APEC A
11_1	-	25.8	-	-	APEC A
11_2	-	25.8	-	-	APEC A
11_3	-	25.8	-	-	APEC A
11_4	-	25.8	-	-	APEC A
11_5	-	25.8	-	-	APEC A
11_6	-	25.8	-	-	APEC A
11_7	-	25.8	-	-	APEC A
12_GF	-	26.2	-	-	APEC A
12_1	-	26.2	-	-	APEC A
12_2	-	26.2	-	-	APEC A
12_3	-	26.2	-	-	APEC A
12_4	-	26.2	-	-	APEC A
12_5	-	26.2	-	-	APEC A
12_6	-	26.2	-	-	APEC A
12_7	-	26.2	-	-	APEC A
13_GF	-	25.9	-	-	APEC A
13_1	-	25.9	-	-	APEC A
13_2	-	25.9	-	-	APEC A
13_3	-	25.9	-	-	APEC A
13_4	-	25.9	-	-	APEC A
13_5	-	25.9	-	-	APEC A
13_6	-	25.9	-	-	APEC A
14_GF	-	25.9	-	-	APEC A
14_1	-	25.9	-	-	APEC A
14_2	-	25.9	-	-	APEC A
14_3	-	25.9	-	-	APEC A

Receptor ID	Annual Mean NO_2 Concentrations (µg/m^3)				
	2020 Baseline	2020 With Dev	Change (µg/m^3)	% Change Relative to Objective	Impact
14_4	-	25.9	-	-	APEC A
14_5	-	25.9	-	-	APEC A
14_6	-	25.9	-	-	APEC A
15_GF	-	25.9	-	-	APEC A
15_1	-	25.9	-	-	APEC A
15_2	-	25.9	-	-	APEC A
15_3	-	25.9	-	-	APEC A
15_4	-	25.9	-	-	APEC A
15_5	-	25.9	-	-	APEC A
15_6	-	25.9	-	-	APEC A
16_GF	-	26.4	-	-	APEC A
16_1	-	26.4	-	-	APEC A
16_2	-	26.4	-	-	APEC A
16_3	-	26.4	-	-	APEC A
16_4	-	26.4	-	-	APEC A
16_5	-	26.4	-	-	APEC A
16_6	-	26.4	-	-	APEC A
17_GF	-	25.9	-	-	APEC A
17_1	-	25.9	-	-	APEC A
17_2	-	25.9	-	-	APEC A
17_3	-	25.9	-	-	APEC A
17_4	-	25.9	-	-	APEC A
17_5	-	25.9	-	-	APEC A
17_6	-	25.9	-	-	APEC A
18_GF	-	23.1	-	-	APEC A
18_1	-	23.1	-	-	APEC A
18_2	-	23.1	-	-	APEC A
18_3	-	23.1	-	-	APEC A
18_4	-	23.1	-	-	APEC A
18_5	-	23.1	-	-	APEC A
18_6	-	23.1	-	-	APEC A
19_GF	-	26.1	-	-	APEC A
19_1	-	26.1	-	-	APEC A
19_2	-	26.1	-	-	APEC A

Receptor ID	Annual Mean NO_2 Concentrations (µg/m^3)				
	2020 Baseline	2020 With Dev	Change (µg/m^3)	% Change Relative to Objective	Impact
19_3	-	26.1	-	-	APEC A
20_GF	-	26.1	-	-	APEC A
20_1	-	26.1	-	-	APEC A
20_2	-	26.1	-	-	APEC A
20_3	-	26.1	-	-	APEC A
21_GF	-	26.1	-	-	APEC A
21_1	-	26.1	-	-	APEC A
21_2	-	26.1	-	-	APEC A
22_GF	-	26.1	-	-	APEC A
22_1	-	26.1	-	-	APEC A
22_2	-	26.1	-	-	APEC A
23_GF	-	26.1	-	-	APEC A
23_1	-	26.1	-	-	APEC A
23_2	-	26.1	-	-	APEC A
24_GF	-	26.1	-	-	APEC A
24_1	-	26.1	-	-	APEC A
24_2	-	26.1	-	-	APEC A
25_GF	-	25.9	-	-	APEC A
25_1	-	25.9	-	-	APEC A
25_2	-	25.9	-	-	APEC A
25_3	-	25.9	-	-	APEC A
26_GF	-	25.9	-	-	APEC A
26_1	-	25.9	-	-	APEC A
26_2	-	25.9	-	-	APEC A
26_3	-	25.9	-	-	APEC A

ANNUAL MEAN PM_{10} CONCENTRATIONS (µg/m^3) – 2020 LAEI BASELINE

Receptor ID	Annual Mean PM_{10} Concentrations (µg/m^3)				
	2020 Baseline	2020 With Dev	Change (µg/m^3)	% Change Relative to Objective	Impact
E_1	27.0	27.0	0.00	0.0	Negligible
E_2	27.6	27.6	0.00	0.0	Negligible
E_3	22.9	22.9	0.00	0.0	Negligible
E_4	22.6	22.6	0.00	0.0	Negligible
E_5	28.6	28.6	0.00	0.0	Negligible
E_6	26.4	26.4	0.00	0.0	Negligible
E_7	27.9	27.9	0.00	0.0	Negligible
E_8	28.5	28.5	0.00	0.0	Negligible
E_9	25.4	25.4	0.01	0.0	Negligible
E_10	23.1	23.1	0.00	0.0	Negligible
E_11	27.6	27.6	0.00	0.0	Negligible
E_12	24.8	24.8	0.00	0.0	Negligible
E_13	24.6	24.6	0.00	0.0	Negligible
E_14	24.7	24.7	0.00	0.0	Negligible
E_15	27.1	27.1	0.00	0.0	Negligible
E_16	28.1	28.1	0.00	0.0	Negligible
E_17	26.5	26.5	0.00	0.0	Negligible
E_18	23.5	23.5	0.00	0.0	Negligible
E_19	22.0	22.0	0.00	0.0	Negligible
E_20	22.2	22.2	0.00	0.0	Negligible
E_21	21.9	21.9	0.00	0.0	Negligible
E_22	21.9	21.9	0.00	0.0	Negligible
E_23	21.9	21.9	0.00	0.0	Negligible
E_24	22.0	22.0	0.00	0.0	Negligible
1_GF	-	21.9	-	-	APEC A
1_1	-	21.9	-	-	APEC A
1_2	-	21.9	-	-	APEC A
1_3	-	21.9	-	-	APEC A
1_4	-	21.9	-	-	APEC A
1_5	-	21.9	-	-	APEC A
1_6	-	21.9	-	-	APEC A
1_7	-	21.9	-	-	APEC A
1_8	-	21.9	-	-	APEC A

Receptor ID	Annual Mean PM_{10} Concentrations (µg/m^3)				
	2020 Baseline	2020 With Dev	Change (µg/m^3)	% Change Relative to Objective	Impact
2_GF	-	21.9	-	-	APEC A
2_1	-	21.9	-	-	APEC A
2_2	-	21.9	-	-	APEC A
2_3	-	21.9	-	-	APEC A
2_4	-	21.9	-	-	APEC A
2_5	-	21.9	-	-	APEC A
2_6	-	21.9	-	-	APEC A
2_7	-	21.9	-	-	APEC A
2_8	-	21.9	-	-	APEC A
3_GF	-	22.1	-	-	APEC A
3_1	-	22.1	-	-	APEC A
3_2	-	22.1	-	-	APEC A
3_3	-	22.1	-	-	APEC A
3_4	-	22.1	-	-	APEC A
3_5	-	22.1	-	-	APEC A
3_6	-	22.1	-	-	APEC A
3_7	-	22.1	-	-	APEC A
3_8	-	22.1	-	-	APEC A
4_GF	-	21.9	-	-	APEC A
4_1	-	21.9	-	-	APEC A
4_2	-	21.9	-	-	APEC A
4_3	-	21.9	-	-	APEC A
4_4	-	21.9	-	-	APEC A
4_5	-	21.9	-	-	APEC A
4_6	-	21.9	-	-	APEC A
4_7	-	21.9	-	-	APEC A
4_8	-	21.9	-	-	APEC A
5_GF	-	21.9	-	-	APEC A
5_1	-	21.9	-	-	APEC A
5_2	-	21.9	-	-	APEC A
5_3	-	21.9	-	-	APEC A
5_4	-	21.9	-	-	APEC A
5_5	-	21.9	-	-	APEC A
5_6	-	21.9	-	-	APEC A

Receptor ID	Annual Mean PM_{10} Concentrations (µg/m^3)				
	2020 Baseline	2020 With Dev	Change (µg/m^3)	% Change Relative to Objective	Impact
5_7	-	21.9	-	-	APEC A
6_GF	-	22.0	-	-	APEC A
6_1	-	22.0	-	-	APEC A
6_2	-	22.0	-	-	APEC A
6_3	-	22.0	-	-	APEC A
6_4	-	22.0	-	-	APEC A
6_5	-	22.0	-	-	APEC A
6_6	-	22.0	-	-	APEC A
6_7	-	22.0	-	-	APEC A
7_GF	-	22.0	-	-	APEC A
7_1	-	22.0	-	-	APEC A
7_2	-	22.0	-	-	APEC A
7_3	-	22.0	-	-	APEC A
7_4	-	22.0	-	-	APEC A
7_5	-	22.0	-	-	APEC A
7_6	-	22.0	-	-	APEC A
7_7	-	22.0	-	-	APEC A
8_GF	-	22.0	-	-	APEC A
8_1	-	22.0	-	-	APEC A
8_2	-	22.0	-	-	APEC A
8_3	-	22.0	-	-	APEC A
8_4	-	22.0	-	-	APEC A
8_5	-	22.0	-	-	APEC A
8_6	-	22.0	-	-	APEC A
8_7	-	22.0	-	-	APEC A
9_GF	-	21.9	-	-	APEC A
9_1	-	21.9	-	-	APEC A
9_2	-	21.9	-	-	APEC A
9_3	-	21.9	-	-	APEC A
9_4	-	21.9	-	-	APEC A
9_5	-	21.9	-	-	APEC A
9_6	-	21.9	-	-	APEC A
9_7	-	21.9	-	-	APEC A
10_GF	-	21.9	-	-	APEC A

Receptor ID	Annual Mean PM_{10} Concentrations (µg/m^3)				
	2020 Baseline	2020 With Dev	Change (µg/m^3)	% Change Relative to Objective	Impact
10_1	-	21.9	-	-	APEC A
10_2	-	21.9	-	-	APEC A
10_3	-	21.9	-	-	APEC A
10_4	-	21.9	-	-	APEC A
10_5	-	21.9	-	-	APEC A
10_6	-	21.9	-	-	APEC A
10_7	-	21.9	-	-	APEC A
11_GF	-	21.9	-	-	APEC A
11_1	-	21.9	-	-	APEC A
11_2	-	21.9	-	-	APEC A
11_3	-	21.9	-	-	APEC A
11_4	-	21.9	-	-	APEC A
11_5	-	21.9	-	-	APEC A
11_6	-	21.9	-	-	APEC A
11_7	-	21.9	-	-	APEC A
12_GF	-	21.9	-	-	APEC A
12_1	-	21.9	-	-	APEC A
12_2	-	21.9	-	-	APEC A
12_3	-	21.9	-	-	APEC A
12_4	-	21.9	-	-	APEC A
12_5	-	21.9	-	-	APEC A
12_6	-	21.9	-	-	APEC A
12_7	-	21.9	-	-	APEC A
13_GF	-	21.9	-	-	APEC A
13_1	-	21.9	-	-	APEC A
13_2	-	21.9	-	-	APEC A
13_3	-	21.9	-	-	APEC A
13_4	-	21.9	-	-	APEC A
13_5	-	21.9	-	-	APEC A
13_6	-	21.9	-	-	APEC A
14_GF	-	21.9	-	-	APEC A
14_1	-	21.9	-	-	APEC A
14_2	-	21.9	-	-	APEC A
14_3	-	21.9	-	-	APEC A

Receptor ID	Annual Mean PM_{10} Concentrations (µg/m^3)				
	2020 Baseline	2020 With Dev	Change (µg/m^3)	% Change Relative to Objective	Impact
14_4	-	21.9	-	-	APEC A
14_5	-	21.9	-	-	APEC A
14_6	-	21.9	-	-	APEC A
15_GF	-	21.9	-	-	APEC A
15_1	-	21.9	-	-	APEC A
15_2	-	21.9	-	-	APEC A
15_3	-	21.9	-	-	APEC A
15_4	-	21.9	-	-	APEC A
15_5	-	21.9	-	-	APEC A
15_6	-	21.9	-	-	APEC A
16_GF	-	22.1	-	-	APEC A
16_1	-	22.1	-	-	APEC A
16_2	-	22.1	-	-	APEC A
16_3	-	22.1	-	-	APEC A
16_4	-	22.1	-	-	APEC A
16_5	-	22.1	-	-	APEC A
16_6	-	22.1	-	-	APEC A
17_GF	-	21.9	-	-	APEC A
17_1	-	21.9	-	-	APEC A
17_2	-	21.9	-	-	APEC A
17_3	-	21.9	-	-	APEC A
17_4	-	21.9	-	-	APEC A
17_5	-	21.9	-	-	APEC A
17_6	-	21.9	-	-	APEC A
18_GF	-	22.0	-	-	APEC A
18_1	-	22.0	-	-	APEC A
18_2	-	22.0	-	-	APEC A
18_3	-	22.0	-	-	APEC A
18_4	-	22.0	-	-	APEC A
18_5	-	22.0	-	-	APEC A
18_6	-	22.0	-	-	APEC A
19_GF	-	22.0	-	-	APEC A
19_1	-	22.0	-	-	APEC A
19_2	-	22.0	-	-	APEC A

Receptor ID	Annual Mean PM_{10} Concentrations (µg/m^3)				
	2020 Baseline	2020 With Dev	Change (µg/m^3)	% Change Relative to Objective	Impact
19_3	-	22.0	-	-	APEC A
20_GF	-	22.0	-	-	APEC A
20_1	-	22.0	-	-	APEC A
20_2	-	22.0	-	-	APEC A
20_3	-	22.0	-	-	APEC A
21_GF	-	21.9	-	-	APEC A
21_1	-	21.9	-	-	APEC A
21_2	-	21.9	-	-	APEC A
22_GF	-	21.9	-	-	APEC A
22_1	-	21.9	-	-	APEC A
22_2	-	21.9	-	-	APEC A
23_GF	-	21.9	-	-	APEC A
23_1	-	21.9	-	-	APEC A
23_2	-	21.9	-	-	APEC A
24_GF	-	21.9	-	-	APEC A
24_1	-	21.9	-	-	APEC A
24_2	-	21.9	-	-	APEC A
25_GF	-	21.9	-	-	APEC A
25_1	-	21.9	-	-	APEC A
25_2	-	21.9	-	-	APEC A
25_3	-	21.9	-	-	APEC A
26_GF	-	21.9	-	-	APEC A
26_1	-	21.9	-	-	APEC A
26_2	-	21.9	-	-	APEC A
26_3	-	21.9	-	-	APEC A

DAILY MEAN PM_{10} (NO. OF DAYS OF EXCEEDANCE) – 2020 LAEI BASELINE

Receptor ID	Days with PM_{10} Concentrations >50µg/m^3			
	2020 Baseline	2020 With Dev	Change (days)	Impact
E_1	18	18	0	Negligible
E_2	19	19	0	Negligible
E_3	8	8	0	Negligible
E_4	7	7	0	Negligible
E_5	23	23	0	Negligible

Receptor ID	Days with PM_{10} Concentrations >50µg/m^3			
	2020 Baseline	2020 With Dev	Change (days)	Impact
E_6	16	16	0	Negligible
E_7	20	20	0	Negligible
E_8	22	22	0	Negligible
E_9	13	13	0	Negligible
E_10	8	8	0	Negligible
E_11	19	19	0	Negligible
E_12	12	12	0	Negligible
E_13	11	11	0	Negligible
E_14	12	12	0	Negligible
E_15	18	18	0	Negligible
E_16	21	21	0	Negligible
E_17	16	16	0	Negligible
E_18	9	9	0	Negligible
E_19	6	6	0	Negligible
E_20	7	7	0	Negligible
E_21	6	6	0	Negligible
E_22	6	6	0	Negligible
E_23	6	6	0	Negligible
E_24	6	6	0	Negligible
1_GF	-	6	-	-
1_1	-	6	-	-
1_2	-	6	-	-
1_3	-	6	-	-
1_4	-	6	-	-
1_5	-	6	-	-
1_6	-	6	-	-
1_7	-	6	-	-
1_8	-	6	-	-
2_GF	-	6	-	-
2_1	-	6	-	-
2_2	-	6	-	-
2_3	-	6	-	-
2_4	-	6	-	-
2_5	-	6	-	-
2_6	-	6	-	-

Receptor ID	Days with PM_{10} Concentrations >50µg/m^3			
	2020 Baseline	2020 With Dev	Change (days)	Impact
2_7	-	6	-	-
2_8	-	6	-	-
3_GF	-	6	-	-
3_1	-	6	-	-
3_2	-	6	-	-
3_3	-	6	-	-
3_4	-	6	-	-
3_5	-	6	-	-
3_6	-	6	-	-
3_7	-	6	-	-
3_8	-	6	-	-
4_GF	-	6	-	-
4_1	-	6	-	-
4_2	-	6	-	-
4_3	-	6	-	-
4_4	-	6	-	-
4_5	-	6	-	-
4_6	-	6	-	-
4_7	-	6	-	-
4_8	-	6	-	-
5_GF	-	6	-	-
5_1	-	6	-	-
5_2	-	6	-	-
5_3	-	6	-	-
5_4	-	6	-	-
5_5	-	6	-	-
5_6	-	6	-	-
5_7	-	6	-	-
6_GF	-	6	-	-
6_1	-	6	-	-
6_2	-	6	-	-
6_3	-	6	-	-
6_4	-	6	-	-
6_5	-	6	-	-
6_6	-	6	-	-

Receptor ID	Days with PM_{10} Concentrations >50µg/m^3			
	2020 Baseline	2020 With Dev	Change (days)	Impact
6_7	-	6	-	-
7_GF	-	6	-	-
7_1	-	6	-	-
7_2	-	6	-	-
7_3	-	6	-	-
7_4	-	6	-	-
7_5	-	6	-	-
7_6	-	6	-	-
7_7	-	6	-	-
8_GF	-	6	-	-
8_1	-	6	-	-
8_2	-	6	-	-
8_3	-	6	-	-
8_4	-	6	-	-
8_5	-	6	-	-
8_6	-	6	-	-
8_7	-	6	-	-
9_GF	-	6	-	-
9_1	-	6	-	-
9_2	-	6	-	-
9_3	-	6	-	-
9_4	-	6	-	-
9_5	-	6	-	-
9_6	-	6	-	-
9_7	-	6	-	-
10_GF	-	6	-	-
10_1	-	6	-	-
10_2	-	6	-	-
10_3	-	6	-	-
10_4	-	6	-	-
10_5	-	6	-	-
10_6	-	6	-	-
10_7	-	6	-	-
11_GF	-	6	-	-
11_1	-	6	-	-

Receptor ID	Days with PM_{10} Concentrations >50µg/m^3			
	2020 Baseline	2020 With Dev	Change (days)	Impact
11_2	-	6	-	-
11_3	-	6	-	-
11_4	-	6	-	-
11_5	-	6	-	-
11_6	-	6	-	-
11_7	-	6	-	-
12_GF	-	6	-	-
12_1	-	6	-	-
12_2	-	6	-	-
12_3	-	6	-	-
12_4	-	6	-	-
12_5	-	6	-	-
12_6	-	6	-	-
12_7	-	6	-	-
13_GF	-	6	-	-
13_1	-	6	-	-
13_2	-	6	-	-
13_3	-	6	-	-
13_4	-	6	-	-
13_5	-	6	-	-
13_6	-	6	-	-
14_GF	-	6	-	-
14_1	-	6	-	-
14_2	-	6	-	-
14_3	-	6	-	-
14_4	-	6	-	-
14_5	-	6	-	-
14_6	-	6	-	-
15_GF	-	6	-	-
15_1	-	6	-	-
15_2	-	6	-	-
15_3	-	6	-	-
15_4	-	6	-	-
15_5	-	6	-	-
15_6	-	6	-	-

Receptor ID	Days with PM_{10} Concentrations >50µg/m^3			
	2020 Baseline	2020 With Dev	Change (days)	Impact
16_GF	-	6	-	-
16_1	-	6	-	-
16_2	-	6	-	-
16_3	-	6	-	-
16_4	-	6	-	-
16_5	-	6	-	-
16_6	-	6	-	-
17_GF	-	6	-	-
17_1	-	6	-	-
17_2	-	6	-	-
17_3	-	6	-	-
17_4	-	6	-	-
17_5	-	6	-	-
17_6	-	6	-	-
18_GF	-	6	-	-
18_1	-	6	-	-
18_2	-	6	-	-
18_3	-	6	-	-
18_4	-	6	-	-
18_5	-	6	-	-
18_6	-	6	-	-
19_GF	-	6	-	-
19_1	-	6	-	-
19_2	-	6	-	-
19_3	-	6	-	-
20_GF	-	6	-	-
20_1	-	6	-	-
20_2	-	6	-	-
20_3	-	6	-	-
21_GF	-	6	-	-
21_1	-	6	-	-
21_2	-	6	-	-
22_GF	-	6	-	-
22_1	-	6	-	-
22_2	-	6	-	-

Receptor ID	Days with PM_{10} Concentrations >50µg/m^3			
	2020 Baseline	2020 With Dev	Change (days)	Impact
23_GF	-	6	-	-
23_1	-	6	-	-
23_2	-	6	-	-
24_GF	-	6	-	-
24_1	-	6	-	-
24_2	-	6	-	-
25_GF	-	6	-	-
25_1	-	6	-	-
25_2	-	6	-	-
25_3	-	6	-	-
26_GF	-	6	-	-
26_1	-	6	-	-
26_2	-	6	-	-
26_3	-	6	-	-

ANNUAL MEAN $PM_{2.5}$ CONCENTRATIONS (µg/m^3) – 2020 BASELINE

Receptor ID	Annual Mean $PM_{2.5}$ Concentrations (µg/m^3)				
	2020 Baseline	2020 With Dev	Change (µg/m^3)	% Change Relative to Objective	Impact
E_1	15.4	15.4	0.00	0.0	Negligible
E_2	15.6	15.6	0.00	0.0	Negligible
E_3	14.1	14.1	0.00	0.0	Negligible
E_4	13.9	13.9	0.00	0.0	Negligible
E_5	16.0	16.0	0.00	0.0	Negligible
E_6	15.2	15.2	0.00	0.0	Negligible
E_7	15.7	15.7	0.00	0.0	Negligible
E_8	15.9	15.9	0.00	0.0	Negligible
E_9	14.8	14.8	0.00	0.0	Negligible
E_10	14.1	14.1	0.00	0.0	Negligible
E_11	15.6	15.6	0.00	0.0	Negligible
E_12	14.6	14.6	0.00	0.0	Negligible
E_13	14.5	14.5	0.00	0.0	Negligible
E_14	14.6	14.6	0.00	0.0	Negligible
E_15	15.4	15.4	0.00	0.0	Negligible
E_16	15.7	15.7	0.00	0.0	Negligible

Receptor ID	Annual Mean $PM_{2.5}$ Concentrations (µg/m^3)				
	2020 Baseline	2020 With Dev	Change (µg/m^3)	% Change Relative to Objective	Impact
E_17	15.2	15.2	0.00	0.0	Negligible
E_18	14.2	14.2	0.00	0.0	Negligible
E_19	13.7	13.7	0.00	0.0	Negligible
E_20	13.7	13.7	0.00	0.0	Negligible
E_21	13.7	13.7	0.00	0.0	Negligible
E_22	13.6	13.6	0.00	0.0	Negligible
E_23	13.6	13.6	0.00	0.0	Negligible
E_24	13.7	13.7	0.00	0.0	Negligible
1_GF	-	13.7	-	-	-
1_1	-	13.7	-	-	-
1_2	-	13.7	-	-	-
1_3	-	13.7	-	-	-
1_4	-	13.7	-	-	-
1_5	-	13.7	-	-	-
1_6	-	13.7	-	-	-
1_7	-	13.7	-	-	-
1_8	-	13.7	-	-	-
2_GF	-	13.7	-	-	-
2_1	-	13.7	-	-	-
2_2	-	13.7	-	-	-
2_3	-	13.7	-	-	-
2_4	-	13.7	-	-	-
2_5	-	13.7	-	-	-
2_6	-	13.7	-	-	-
2_7	-	13.7	-	-	-
2_8	-	13.7	-	-	-
3_GF	-	13.8	-	-	-
3_1	-	13.8	-	-	-
3_2	-	13.8	-	-	-
3_3	-	13.8	-	-	-
3_4	-	13.8	-	-	-
3_5	-	13.8	-	-	-
3_6	-	13.8	-	-	-
3_7	-	13.8	-	-	-

Receptor ID	Annual Mean $PM_{2.5}$ Concentrations (µg/m^3)				
	2020 Baseline	2020 With Dev	Change (µg/m^3)	% Change Relative to Objective	Impact
3_8	-	13.8	-	-	-
4_GF	-	13.7	-	-	-
4_1	-	13.7	-	-	-
4_2	-	13.7	-	-	-
4_3	-	13.7	-	-	-
4_4	-	13.7	-	-	-
4_5	-	13.7	-	-	-
4_6	-	13.7	-	-	-
4_7	-	13.7	-	-	-
4_8	-	13.7	-	-	-
5_GF	-	13.7	-	-	-
5_1	-	13.7	-	-	-
5_2	-	13.7	-	-	-
5_3	-	13.7	-	-	-
5_4	-	13.7	-	-	-
5_5	-	13.7	-	-	-
5_6	-	13.7	-	-	-
5_7	-	13.7	-	-	-
6_GF	-	13.7	-	-	-
6_1	-	13.7	-	-	-
6_2	-	13.7	-	-	-
6_3	-	13.7	-	-	-
6_4	-	13.7	-	-	-
6_5	-	13.7	-	-	-
6_6	-	13.7	-	-	-
6_7	-	13.7	-	-	-
7_GF	-	13.7	-	-	-
7_1	-	13.7	-	-	-
7_2	-	13.7	-	-	-
7_3	-	13.7	-	-	-
7_4	-	13.7	-	-	-
7_5	-	13.7	-	-	-
7_6	-	13.7	-	-	-
7_7	-	13.7	-	-	-

Receptor ID	Annual Mean $PM_{2.5}$ Concentrations (µg/m^3)				
	2020 Baseline	2020 With Dev	Change (µg/m^3)	% Change Relative to Objective	Impact
8_GF	-	13.7	-	-	-
8_1	-	13.7	-	-	-
8_2	-	13.7	-	-	-
8_3	-	13.7	-	-	-
8_4	-	13.7	-	-	-
8_5	-	13.7	-	-	-
8_6	-	13.7	-	-	-
8_7	-	13.7	-	-	-
9_GF	-	13.7	-	-	-
9_1	-	13.7	-	-	-
9_2	-	13.7	-	-	-
9_3	-	13.7	-	-	-
9_4	-	13.7	-	-	-
9_5	-	13.7	-	-	-
9_6	-	13.7	-	-	-
9_7	-	13.7	-	-	-
10_GF	-	13.7	-	-	-
10_1	-	13.7	-	-	-
10_2	-	13.7	-	-	-
10_3	-	13.7	-	-	-
10_4	-	13.7	-	-	-
10_5	-	13.7	-	-	-
10_6	-	13.7	-	-	-
10_7	-	13.7	-	-	-
11_GF	-	13.7	-	-	-
11_1	-	13.7	-	-	-
11_2	-	13.7	-	-	-
11_3	-	13.7	-	-	-
11_4	-	13.7	-	-	-
11_5	-	13.7	-	-	-
11_6	-	13.7	-	-	-
11_7	-	13.7	-	-	-
12_GF	-	13.7	-	-	-
12_1	-	13.7	-	-	-

Receptor ID	Annual Mean $PM_{2.5}$ Concentrations (µg/m^3)				
	2020 Baseline	2020 With Dev	Change (µg/m^3)	% Change Relative to Objective	Impact
12_2	-	13.7	-	-	-
12_3	-	13.7	-	-	-
12_4	-	13.7	-	-	-
12_5	-	13.7	-	-	-
12_6	-	13.7	-	-	-
12_7	-	13.7	-	-	-
13_GF	-	13.7	-	-	-
13_1	-	13.7	-	-	-
13_2	-	13.7	-	-	-
13_3	-	13.7	-	-	-
13_4	-	13.7	-	-	-
13_5	-	13.7	-	-	-
13_6	-	13.7	-	-	-
14_GF	-	13.7	-	-	-
14_1	-	13.7	-	-	-
14_2	-	13.7	-	-	-
14_3	-	13.7	-	-	-
14_4	-	13.7	-	-	-
14_5	-	13.7	-	-	-
14_6	-	13.7	-	-	-
15_GF	-	13.7	-	-	-
15_1	-	13.7	-	-	-
15_2	-	13.7	-	-	-
15_3	-	13.7	-	-	-
15_4	-	13.7	-	-	-
15_5	-	13.7	-	-	-
15_6	-	13.7	-	-	-
16_GF	-	13.7	-	-	-
16_1	-	13.7	-	-	-
16_2	-	13.7	-	-	-
16_3	-	13.7	-	-	-
16_4	-	13.7	-	-	-
16_5	-	13.7	-	-	-
16_6	-	13.7	-	-	-

Receptor ID	Annual Mean $PM_{2.5}$ Concentrations (µg/m^3)				
	2020 Baseline	2020 With Dev	Change (µg/m^3)	% Change Relative to Objective	Impact
17_GF	-	13.7	-	-	-
17_1	-	13.7	-	-	-
17_2	-	13.7	-	-	-
17_3	-	13.7	-	-	-
17_4	-	13.7	-	-	-
17_5	-	13.7	-	-	-
17_6	-	13.7	-	-	-
18_GF	-	13.7	-	-	-
18_1	-	13.7	-	-	-
18_2	-	13.7	-	-	-
18_3	-	13.7	-	-	-
18_4	-	13.7	-	-	-
18_5	-	13.7	-	-	-
18_6	-	13.7	-	-	-
19_GF	-	13.7	-	-	-
19_1	-	13.7	-	-	-
19_2	-	13.7	-	-	-
19_3	-	13.7	-	-	-
20_GF	-	13.7	-	-	-
20_1	-	13.7	-	-	-
20_2	-	13.7	-	-	-
20_3	-	13.7	-	-	-
21_GF	-	13.7	-	-	-
21_1	-	13.7	-	-	-
21_2	-	13.7	-	-	-
22_GF	-	13.7	-	-	-
22_1	-	13.7	-	-	-
22_2	-	13.7	-	-	-
23_GF	-	13.7	-	-	-
23_1	-	13.7	-	-	-
23_2	-	13.7	-	-	-
24_GF	-	13.7	-	-	-
24_1	-	13.7	-	-	-
24_2	-	13.7	-	-	-

Receptor ID	Annual Mean $PM_{2.5}$ Concentrations (µg/m^3)				
	2020 Baseline	2020 With Dev	Change (µg/m^3)	% Change Relative to Objective	Impact
25_GF	-	13.7	-	-	-
25_1	-	13.7	-	-	-
25_2	-	13.7	-	-	-
25_3	-	13.7	-	-	-
26_GF	-	13.7	-	-	-
26_1	-	13.7	-	-	-
26_2	-	13.7	-	-	-
26_3	-	13.7	-	-	-

Appendix K

REPORT LIMITATIONS

This report has been prepared for the titled project or named part thereof and should not be used in whole or in part and relied upon for any other project without the written authorisation of WSP UK Limited. WSP UK Limited accepts no responsibility or liability for the consequences of this document if it is used for a purpose other than that for which it was commissioned. Persons wishing to use or rely upon this report for other purposes must seek written authority to do so from the owner of this report and/ or WSP UK Limited and agree to indemnify WSP UK Limited for any and all loss or damage resulting therefrom. WSP UK Limited accepts no responsibility or liability for this document to any other part other than the person by whom it was commissioned.

The findings and opinions expressed are relevant to the dates of the site works and should not be relied upon to represent conditions at substantially later dates. Opinions included therein are based on information gathered during the study and our experience. If additional information becomes available which may affect our comments, conclusions or recommendations WSP UK Limited reserve the right to review the information, reassess any new potential concerns and modify our opinions accordingly.



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Appendix E

EXTERNAL BILDING FABRIC ASSESSMENT

RBA ACOUSTICS

COMAG SITE, WEST DRAYTON, LONDON

External Building Fabric Assessment

Reference: 8788.RP01.EBF.0
Prepared: 4 September 2018
Revision Number: 0

Redrow Homes
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7 Station Street
London
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External Building Fabric Assessment

COMAG SITE, WEST DRAYTON, LONDON

Reference: 8788.RP01.EBF.0
Prepared: 4 September 2018

Revision	Comment	Date	Prepared By	Approved By
0	First issue of report	4 September 2018	Callum Stewart	Robert Barlow

Terms of contract:

RBA Acoustics Ltd has prepared this report in accordance with our Scope of Work 8788.ACB01.0.15062018.RJB dated 15 June 2018. RBA Acoustics Ltd shall not be responsible for any use of the report or its contents for any purpose other than that for which it was provided. Should the Client require the distribution of the report to other parties for information, the full report should be copied. No professional liability or warranty shall be extended to other parties by RBA Acoustics Ltd without written agreement from RBA Acoustics Ltd.

The recommendations within this report relate to acoustics performance only and will need to be integrated within the overall design by the lead designer to incorporate all other design disciplines such as fire, structural integrity, setting-out, etc. Similarly, any sketches appended to this report illustrate acoustic principles only and again will need to be developed in to full working drawings by the lead designer to incorporate all other design disciplines.

In line with our Environmental Policy, up to two hard copies of the report will be provided upon request. Additional copies of the report, or further hard copies of revised reports, would be subject to an administrative cost of £20.00 (+VAT) per copy.

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1.0 INTRODUCTION

A new residential development is proposed at the location of the COMAG Site, West Drayton. The development consists of 104 apartments over 6 storeys, with retail premises at ground floor and basement parking.

An assessment has been carried out in relation to the noise levels likely to be incident on the proposed building façades and to provide acoustic performance specifications such that acceptable internal noise criteria can be achieved.

This report details the results of the noise survey and sets out the acoustic performance requirements of the external building fabric elements. In addition, suitable plant noise emission criteria have also been developed based upon the survey results and the likely requirements of the London Borough of Hillingdon.

2.0 ENVIRONMENTAL NOISE SURVEY

2.1 Survey Methodology

Monitoring of the prevailing background noise was undertaken over the following 24 hour period:

- 13:00 hours 21 August to 13:00 hours 22 August 2018.

As the survey was unattended it is not possible to comment with certainty regarding meteorological conditions throughout the entire survey period, however the based on observations during the site visits, and weather reports for the area, it was generally considered suitable for obtaining representative noise measurements, it being predominantly dry with little wind.

Measurements were made of the L_{A90}, L_{Amax} and L_{Aeq} noise levels over sample periods of 15 minutes duration.

2.2 Measurement Locations

To determine the existing noise climate around the site measurements were undertaken at the following locations.

Position 1

Measurements were taken on the western façade of the existing COMAG building at 2nd floor level. The microphone was attached to an A-frame and was hung from the 2nd floor window on the western façade close to the southwest corner of the building at 1m distance from the existing building facade. The microphone was within line of sight of the nearest rail track which was approximately 55m away. The future façade is to be approximately 7.5m closer to the railway than the measurement position. The measurement position is also illustrated on the site plan attached in Figure 1 and the photograph in Photo 1.

The prevailing noise climate was noted to mainly consist of high speed and freight rail traffic as well as road traffic along Tavistock Road.

Position 2

Measurements were taken on the northern edge of the existing COMAG building on the rear rooftop at 2nd floor level. The microphone was attached to a pole which was then attached to the existing railings that run along the boundary of the northern edge of the roof. The microphone overlooked Winnock Road which was approximately 12 meters away.

The microphone was also within line of sight of the nearest rail track which was approximately 84m away. Measurement Position 2 is also illustrated on the site plan attached in Figure 1 and the photograph in Photo 2.

The prevailing noise climate was noted to mainly consist of high speed and freight rail traffic as well as road traffic along both Winnock Road and Tavistock Road.

2.3 Instrumentation

For information regarding the equipment used for the measurements please refer to Appendix C.

The sound level meters were calibrated both prior to and on completion of the survey with no significant calibration drifts observed.

2.4 Results

The noise levels measured are shown as time-histories on the attached Graphs 1-4.

Measurement Positions 1 and 2

The measured L_{Aeq}, L_{A90} and L_{Amax} 15 minute period levels are shown as time-histories on the attached Graphs 7247/G1-4. The averaged measured daytime and night-time L_{Aeq} noise levels are summarised in the following Table 1 below.

Table 1 – Façade Incident L_{Aeq} Noise Levels

Measurement Position	Average $L_{Aeq, period}$ Noise Level (dB)	
	Daytime (07:00 – 23:00)	Night-time (23:00 – 07:00)
Position 1	64	58
Position 2	59	50

In order to ensure a worst case assessment the lowest background L_{A90} noise levels measured have been used in our analyses. The lowest L_{A90} noise levels measured are summarised in Table 2, along with typical L_{AFmax} levels measured during the night time in Table 3.

Table 2 – Measured Minimum $L_{A90,15mins}$ Noise Levels

Measurement Position	Minimum $L_{A90, 15mins}$ Noise Level during period (dB)	
	Daytime (07:00 – 23:00)	Night-time (23:00 – 07:00)
Position 1	46	44
Position 2	43	42

Table 3 – Typical measured $L_{AFmax,ns}$ Noise Levels

Measurement Position	Typical $L_{Amax, 1mins}$ Noise Level during period (dB)	
	Daytime (07:00 – 23:00)	Night-time (23:00 – 07:00)
Position 1	N/A	82
Position 2	N/A	70

Please note that the levels as measured above are subject to corrections due to façade reflections and distance losses.

Averaged spectral noise levels are graphically represented on the attached Graphs 7247/G5-6.

3.0 EXTERNAL BUILDING FABRIC CRITERIA

This section outlines typical assessment criteria in terms of the relevant standards. A brief explanation of the acoustic terminology used in this report is shown within Appendix A.

3.1 British Standard 8233:2014

BS 8233:2014 *Guidance on Sound insulation and noise reduction for buildings* draws on the results of research and experience to provide information on achieving internal acoustic environments appropriate to their functions.

The noise level values given are in terms of an average (L_{Aeq}) level.

The standard advises internal ambient noise levels for achieving suitable resting and sleeping conditions within residential properties as set out in Table 5. A brief explanation of the acoustic terminology used in this report is shown in Appendix A attached.

Table 4 – BS 8233:2014 Residential Criteria

Room	07:00 to 23:00	23:00 to 07:00
Living Rooms	35 dB $L_{Aeq,16hour}$	--
Dining Room/area	40 dB $L_{Aeq,16hour}$	--
Bedrooms	35dB $L_{Aeq,16hour}$	30 dB $L_{Aeq,8hour}$

3.2 World Health Organisation: Guidelines for Community Noise

The document describes guideline levels that are *"essentially values for the onset of health effects from noise exposure".*

A table of guideline values is included, relating to adverse health effects, referred to as any temporary or long term deterioration in physical, psychological, or social functioning that is associated with noise exposure.

Table 6 sets out the guidance from *Table 4.1: Guideline values for community noise in specific environments*, as stated in the document.

Table 5 – Guideline Values for Community Noise

Specific Environment	Critical Health Effect(s)	L_{Aeq} (dB)	Time Base (hours)	$L_{Amax,f}$ (dB)
Outdoor living area	Serious annoyance, daytime and evening	55	16	-
	Moderate annoyance, daytime and evening	50	16	-
Dwelling, indoors	Speech intelligibility and moderate annoyance, daytime and evening	35	16	-
Inside bedrooms	Sleep disturbance, night-times	30	8	45
Outside bedrooms	Sleep disturbance, window open (outdoor values)	45	8	60

With reference to maximum noise levels the following guidance is provided within the WHO guidance:

> *"For a good sleep, it is believed that indoor sound pressure levels should not exceed approximately 45dB L_{Amax} more than 10-15 times per night (Vallet & Vernet 1991) and most studies show an increase in the percentage of awakenings at SEL values of 55-60 dBA (Passchier-Vermeer 1993; Finegold et al. 1994; Pearsons et al. 1995). For intermittent events that approximate aircraft noise, with an effective duration of 10-30s, SEL values of 55-60 corresponds to a L_{Amax} value of 45dB. Ten to 15 of these events during an 8 hour night-time implies a $L_{Aeq, 8h}$ of 20-25dB. This is 10-15dB below the $L_{Aeq, 8h}$ or 30dB for continuous night-time noise exposure, and shows that intermittent character of noise must be taken into account when setting night-time noise limits for noise exposure. For example, this can be achieved by considering the number of noise events and the difference between the maximum sound pressure level and the background of these events."*

Therefore the frequency of occurrence of maximum noise events should not typically exceed 10-15 times in any night.

3.3 Summary

The project criteria adopted are therefore as follows;

Bedroom	Night-time (23:00-07:00)	30dB L_{Aeq} 45dB L_{AFmax}
Living Rooms	Daytime (07:00-23:00)	35dB L_{Aeq}

4.0 EXTERNAL BUILDING FABRIC ASSESSMENT

4.1 Background

Analyses of the external building fabric have been undertaken in order to ascertain the required acoustic performance of the glazing and other external fabric elements to achieve the project criteria.

4.2 Assumptions

Our external building fabric analyses have assumed the following:

(a) Drawings

The assessment has been based on the information provided in the elevations and site layouts from the Rolfe Judd Planning drawing package dated August 2017.

(b) Noise Levels

The assessment has been based on the measured noise levels as detailed in Section 2.4.

(c) Room Absorption

The bedrooms are assumed to be acoustically "soft" with carpets, curtains and other soft furnishings. For the purposes of our analyses we have assumed the absorption coefficients detailed in Tables 6 and 7.

Table 6 – Bedroom Absorption Coefficients

Absorption Coefficient (α) at Octave Band Centre Frequency (Hz)							
63	125	250	500	1k	2k	4k	8k
0.15	0.18	0.25	0.27	0.31	0.32	0.32	0.32

The living rooms are assumed to be less acoustically absorptive (with a hard floor finish, although with furnishings). For the purposes of our analyses we have assumed the following absorption coefficients.

Table 7 – Living Room Absorption Coefficients

Absorption Coefficient (α) at Octave Band Centre Frequency (Hz)							
63	125	250	500	1k	2k	4k	8k
0.15	0.18	0.20	0.22	0.22	0.22	0.23	0.27

(d) External Wall

External non-glazed areas are to comprise the following:

- Brickwork
- Thermal insulation and cavity
- Metsec type frame with mineral wool in void
- 2 layers 15mm dense plasterboard (min 12.5kg/m^2 per board)

As such, we have assumed the following sound reduction indices (equating to an overall R_W of 58dB) for all non-glazed façade areas comprising the above construction:

Table 8– Non-Glazed SRIs

Assumed Sound Reduction Index (dB) at Octave Band Centre Frequency (Hz)							
63	125	250	500	1k	2k	4k	8k
35	42	48	53	63	70	74	74

Should the proposals for non-glazed areas change, it is critical we are informed at the earliest opportunity as this could have a significant impact on the sound insulation performance requirements of the glazing systems.

(e) Ventilation

It is understood the chosen ventilation strategy is via a mechanical ventilation and heat recovery system (MVHR). Should the proposals for ventilation change to include mechanisms such as trickle ventilators, it is important that RBA Acoustics is informed at the earliest opportunity as alternative vents could have a significant impact on the sound insulation performance for the building.

Please note that during periods where windows are opened for purge/rapid ventilation, noise levels will naturally be increased internally (see Section 5.0).

4.3 Specification & Guidance Constructions

Appendix B details the sound reduction performance specification for the ventilators and glazed elements of the external building fabric.

The glazing performance specifications apply to the glazing package as a whole inclusive of glazing, louvres, spandrel panels, framing, opening lights, doors, seals, etc. The performance of the glazing system will depend on many factors such as the glazing configuration, size of window panels, quality of framing, quality of sealing, etc.

For guidance purposes we would typically expect the following glazing configurations detailed below to prove commensurate with achieving the sound insulation performance specifications detailed within Appendix B.

Please note – *The glazing configurations described in Table 9 are given for costing purposes only. All window systems should be capable of meeting the performance specifications shown in Appendix B, with laboratory test certificates being made available in support of the quoted performance. Glazing proposals which simply reflect the guidance constructions indicated in this report will not, in isolation, be sufficient evidence that a window configuration will meet the performance specification.*

Table 9 – Glazing Guidance Constructions

Glazing Type	Glazing Configuration
G1	Acoustically rated double glazing e.g. 10mm glass / 12mm cavity / 6.4mm acoustically laminated glass
G2	Standard thermal double glazing with differing pane thicknesses, e.g. 4mm glass / 12mm cavity / 6mm glass

It should be noted that due to the necessity for security laminated glass on the ground (lower / accessible) floors, the specifications may exceed those stated above in some locations.

4.4 Applicable Zoning

Due to the differences in the prevailing noise climate around the site and the types of rooms at each floor level, three primary glazing zones have been defined, as indicated on the façade zoning plan provided in Figure 2 in Appendix E.

(i) Zone 1 – Glazing Type: G1

(ii) Zone 2 – Glazing Type: G2

4.5 Flanking Specification

We also advise on the flanking specification for any curtain walling or continuous glazing systems proposed as follows to aid the development of such systems.

Flanking Performance Specification

The previous sections are in relation to external noise intrusion through any curtain walling systems to internal areas. Separating wall and floor sound insulation performance can often be compromised by curtain walling systems. It is thus important that an additional specification for the curtain walling package be introduced, which will limit the amount of sound transfer across separating wall and floor lines through the curtain walling system. A flanking performance specification is attached within Appendix B – Section 3.0.

Achievement of the specification can be demonstrated by laboratory acoustic testing in general accordance with BS EN ISO 10848-2:2006. This is admittedly a complex and costly testing procedure and therefore the supplier may – following tender reviews – be allowed to demonstrate by other means that the specification can be achieved. This is reflected in the specification wording.

The specification should also be incorporated within any other packages, which could affect the transmission of flanking sound at separating wall and floor lines.

It is likely insulated double/split mullions and transoms will be required in order to achieve the attached flanking specification. This obviously has a large impact on the design and style of any curtain walling system and should be investigated at the earliest opportunity to ensure the specification is achieved.