OTTERPOOL PARK

Environmental Statement Appendix 6.7: Canterbury AQMA Sensitivity Test

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Canterbury AQMA Sensitivity Test

1.1 Overview

This note explains the rationale, methodology and results of a sensitivity test carried out to demonstrate the operational phase local air quality impact of the proposed development on the Canterbury Air Quality Management Area No.3 located within Canterbury City Council's (CCC) administrative boundary.

1.2 Rationale for undertaking the Canterbury Sensitivity Test

The application site is located within Folkestone & Hythe District Council (F&HDC), Kent and spans a large area located south of the M20 (west of Junction 11). The operational phase of the proposed development has the potential to increase traffic flows on the local road network as the construction of new residential and commercial areas will lead to additional vehicle journeys to and from the application site.

The Scoping Opinion requested from F&HDC requested consideration of the impact of the proposed Development upon the Canterbury No.3 AQMA. CCC were concerned that the proposed development could potentially lead to increase pollutant concentrations in the AQMA. The AQMA is declared for annual mean NO_2 demonstrating widespread exceedance of the relevant annual mean AQS objective; therefore the sensitivity test focusses on impacts of the proposed development on annual mean NO_2.

As a result of the concerns, additional air quality modelling has been undertaken to predict the impacts at a sample set of receptors along Old Dover Road in eastern Canterbury, presented in Figure 1.

1.3 Scope of Assessment

The operational phase air quality assessment which informed Chapter 6 of the ES was based on traffic data provided by Arcadis's transport planning team. The traffic microsimulation extent was centred on the application site and covered the M20 corridor area between Ashford to the north-west and Capel-le-Ferne to the east. Following the EIA scoping response from CCC, the extent of the transport modelling study area was extended to include routes between Otterpool Park and Canterbury. Kent County Council were consulted in June and July 2018 to determine the scope of modelling required. Following a detailed analysis of traffic flow increases on these routes, Kent County Council stated that the scope of modelling should include the Old Dover Road junctions with Nackington Road and St Lawrence Road. Full information is provided within the transport assessment.

Available ATC data was used to derive AADT flows from peak hour flows. Due to the limited availability of ATC data at the time, AADT flows were calculated for:

- B2086 Old Dover Road between Randolph Close and B2086 Nackington Road
- B2086 Nackington Road between Old Dover Road and the A2 flyover.

However, the scoping exercise with Kent County Council determined that the effect of flow increases due to the Otterpool Park development on other links was not expected to be significant in capacity terms.

Without and with proposed development flows were provided for these roads in AADT 24hr flows for each of 2024, 2030 and 2044. Further information on these traffic datasets and scenarios is provided in the Chapter 6 Air Quality. Neither of these roads overlap the boundary of the AQMA, however Old Dover Road overlaps with the AQMA west of Randolph Close. Traffic flows on Old Dover Road east of Randolph Road are likely to be very similar to those on the road network where traffic data has been provided on Old Dover Road (east of Randolph Close) and Nackington Road. Additionally a number of receptors are located on the edge of the

road. It is for these reasons why the operational impact of the proposed development has been modelled at these receptors as a proxy to the AQMA.

Old Dover Road flows into the AQMA and is the road with the largest increase in traffic due to the proposed development. The change in AADT in each assessment year is summarised in Table 1 below.

Table 1 - AADT flows without and with the proposed development in Canterbury during 2024, 2030 and 2044

Year	Without proposed development	With proposed development	Change
Old Dover Road			
2024	11698	11704	+6
2030	12370	12421	+51
2044	15613	15835	+222
Nackington Road			
2024	9309	9321	+12
2030	9890	9989	+99
2044	10982	11430	+448

Table 1 demonstrates that the change in traffic flows is minimal on both roads during 2024 and 2030. The flow changes in 2024 and 2030 do not meet the criteria for assessment as detailed in the IAQM's (2017) Land Use Planning and Development Control guidance. This is because the magnitude of traffic flow change is lower than the thresholds for assessment cited in the which states that the change in traffic must exceed 100 veh/day for Light Duty Vehicles and 25 veh/day for Heavy Duty Vehicles. Changes in HDV flow are negligible (<11 veh/day) on each road in each assessment year. The traffic change in 2030 is close to exceeding the criteria set by the IAQM; however it was decided not to model the 2030 scenario. This is because the 2044 assessment utilises 2030 emission rates and backgrounds as 2030 represents the horizon year of the Defra air quality assessment tools. Emissions and backgrounds are expected to decrease over time, whilst traffic is expected to increase. Therefore assessing 2044 traffic levels with 2030 emissions is a worst case approach and the impacts would be greater than if 2030 traffic levels were assessed with 2030 emissions.

Table 1 shows that during 2044 increases in traffic are fairly small on both Old Dover Road (+222 vehicles per day) and Nackington Road (+448 vehicles per day) but exceed the IAQM flow change criteria for assessment.

It should be noted that it is unlikely that the AQMA will exist in 2044 as pollutant concentrations are expected to decrease nationally over time with the uptake of cleaner vehicles; this should lead to the revocation of the order that initially declared the AQMA.

Old Dover Road flows into the Canterbury No.3 AQMA via the Riding Gate roundabout where traffic would be expected to disperse across the A28 Upper Bridge Street, Watling Street and A28 Rhodaus Town, therefore it would be expected the increase in vehicle flow from the proposed development on these roads

would be smaller than on Old Dover Road. Consequently the assessment only considered receptors located along Old Dover Road and Nackington Road as the other roads which reside within the AQMA would have a lesser impact in terms of traffic and air quality. Moreover, traffic data was not available for any roads within the AQMA.

The impact of the additional flows was modelled at receptors located closest to Old Dover Road and Nackington Road.

1.4 Methodology

The methodology of the air quality modelling and data inputs are explained in full in the main air quality chapter (Chapter 6 of the ES). For clarity it should be noted that the results presented in this note were calculated using model configurations (i.e. model parameters and air quality tools used) are identical to those used to inform the air quality chapter.

As detailed in the air quality chapter, it should be noted that assessment of 2044 is worst case as current air quality tools (in terms of emission rate and background concentrations) issued by Defra have a horizon year of 2030. Therefore the 2044 assessment is considered to be worst case as emissions rates and background concentrations are likely to decrease between 2030 and 2046 due to government policy and integration of greater numbers of cleaner vehicles into the traffic fleet.

The model was verified using the 2018 monitored concentration at CCC's DT33 diffusion tube site (located west of Nackington Road next to St Lawrence Ground and Kent and Canterbury Hospital) as this was the only CCC monitoring site appropriately covered by the traffic network provided. This produced a road NOx verification factor of 4.18 suggesting that the model was underpredicting concentrations, which was expected given the limited extent of the modelled road network.

The modelled locations are shown on Figure 1 and Figure 2 in relation to the AQMA.

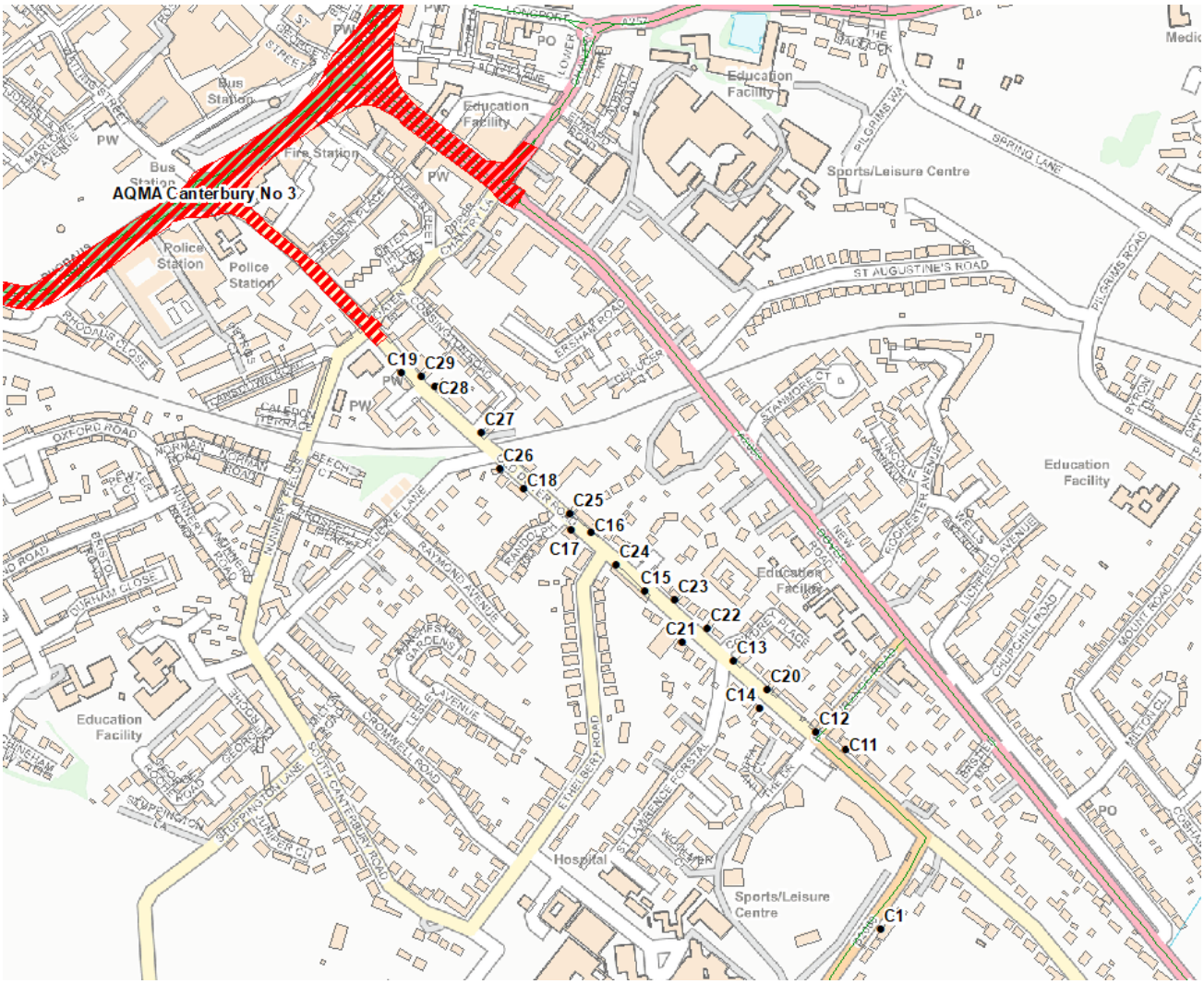

Figure 1: Location of Modelled Receptors on Old Dover Road in relation to AQMA Canterbury No.3

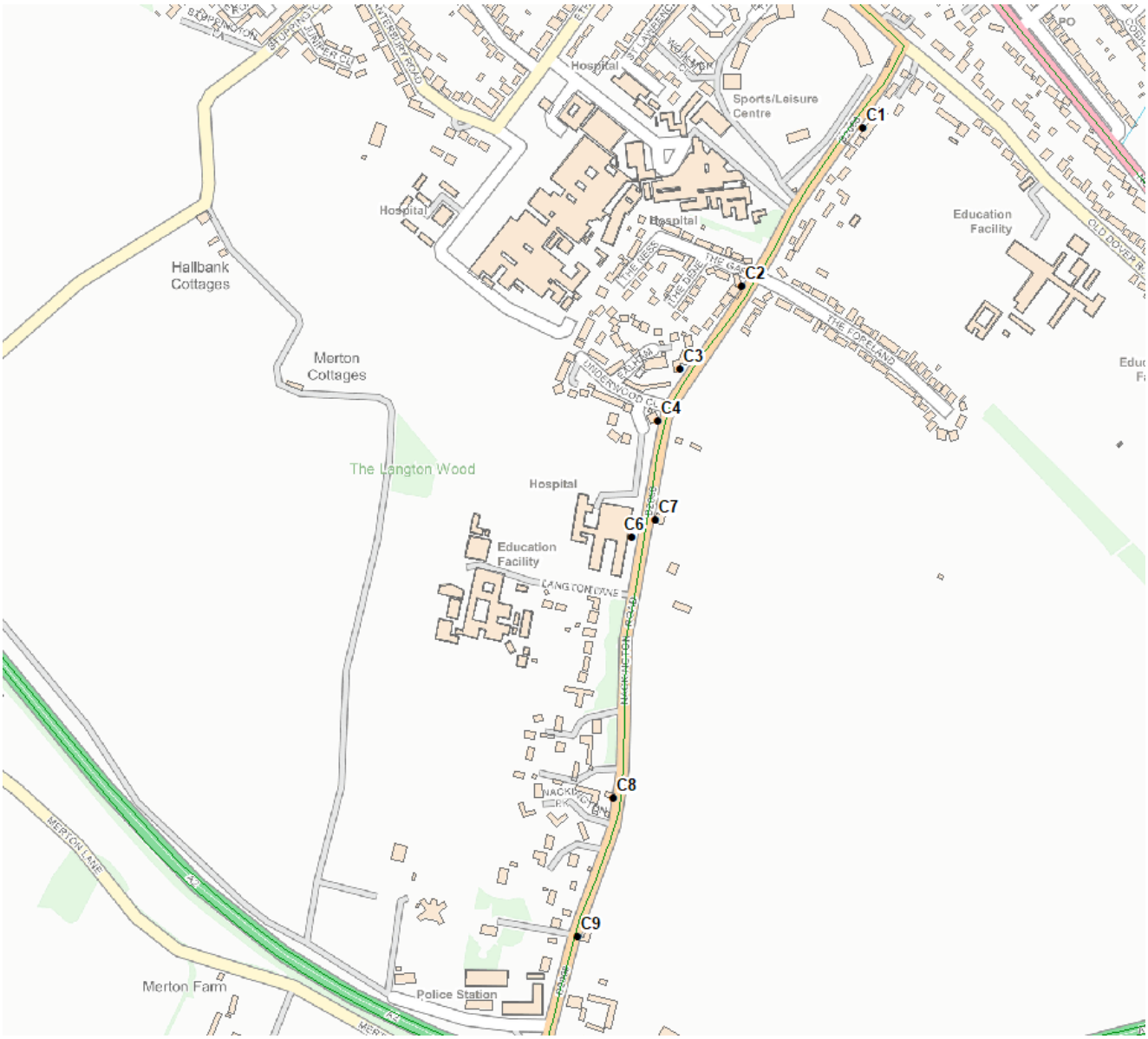

Figure 2: Location of Modelled Receptors on Nackington Road

1.5 Results

No significant effects on the Canterbury AQMA No.3 are anticipated in 2024 or 2030 as the change in traffic flows associated with the proposed development is marginal. Modelling of the increases in traffic associated with the completed development in 2044 demonstrates that as a worst case, the largest increase in annual mean NO_2 will be 0.3 µg/m^3 at C9; this would be categorised as negligible in the IAQM impact descriptor matrix (refer to Table 6-8 of Chapter 6). The impacts at the rest of the modelled receptors are all less than 0.3 µg/m^3, therefore given the low total concentrations, all of the impacts would be categorised as negligible. Figure 3 shows that the maximum increase on Old Dover Road (which feeds into the AQMA at its westernmost end) is 0.1 µg/m^3. Impacts on Nackington Road are displayed on Figure 4, and Table 2 summarises the results at all modelled receptors.

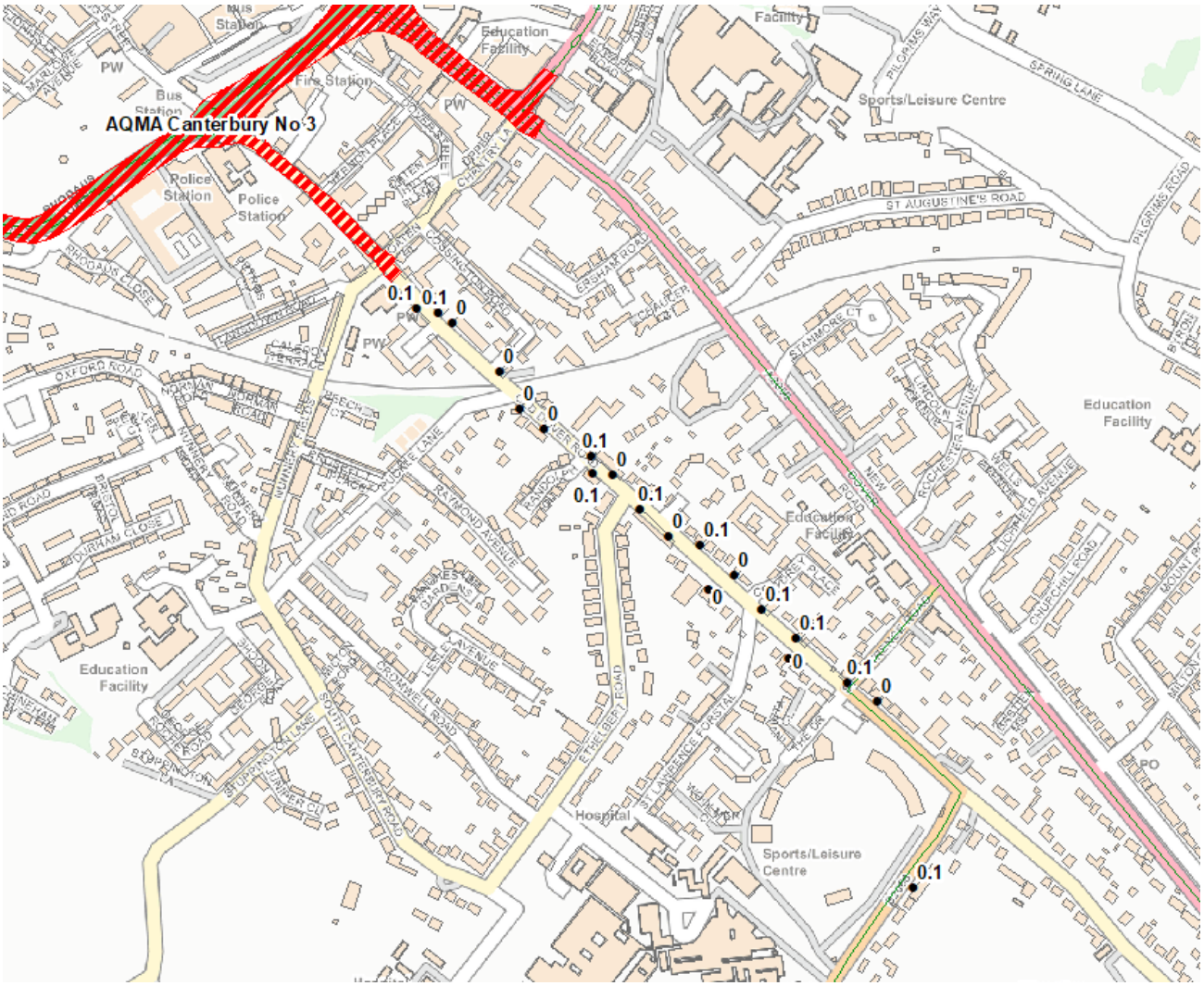

Figure 3: Change in annual mean NO_2 concentrations at Modelled Receptors on Old Dover Road during 2044.

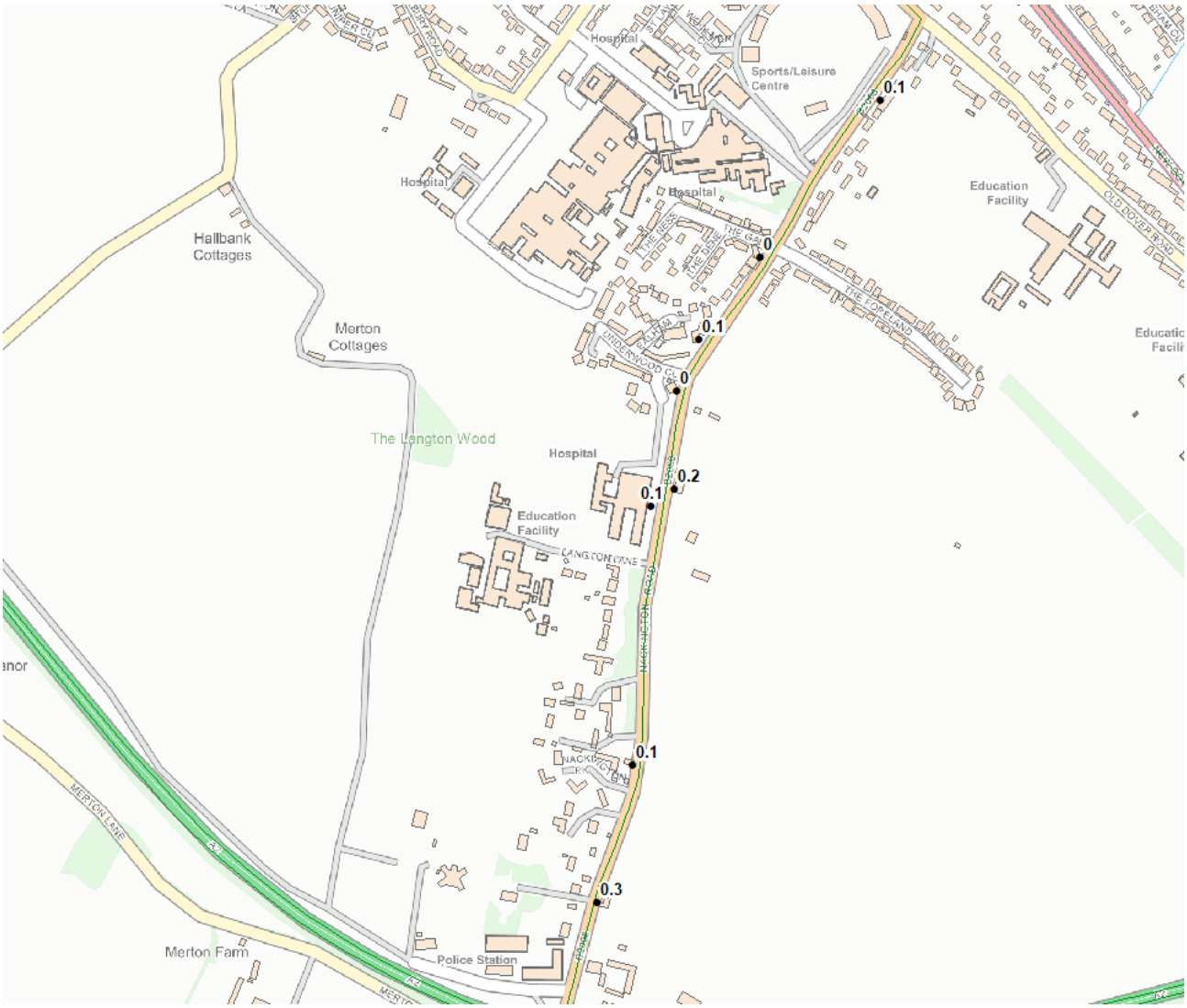

Figure 4: Change in annual mean NO_2 at Modelled Receptors on Nackington Road during 2044

Table 2 - Change in Annual Mean NO_2 Concentration at modelled receptors during 2044

ID	X	Y	2044 Annual Mean NO_2 Concentration (µg/m^3)		
			Without proposed development	With proposed development	Change
C1	615865.7	156498.4	12.5	12.6	0.1
C2	615690.6	156272.3	11.7	11.7	0.0
C3	615603.6	156153.7	11.3	11.4	0.1
C4	615571.6	156079.3	11.6	11.6	0.0

ID	X	Y	2044 Annual Mean NO_2 Concentration ($\mu g/m^3$)		
			Without proposed development	With proposed development	Change
C6	615533.3	155911.9	10.1	10.2	0.1
C7	615567.4	155936.8	12.8	13.0	0.2
C8	615506.8	155538.8	10.8	10.9	0.1
C9	615455.5	155339.3	14.3	14.6	0.3
C10	615393.7	155076	11.6	11.7	0.1
C11	615820.9	156729.6	13.8	13.8	0.0
C12	615783.3	156751.4	15.9	16.0	0.1
C13	615677.7	156843.1	16.0	16.1	0.1
C14	615710.7	156782.9	12.4	12.4	0.0
C15	615562.3	156933.6	14.8	14.8	0.0
C16	615493.7	157009	18.0	18.1	0.0
C17	615467.6	157011.6	15.5	15.6	0.1
C18	615407.9	157065.4	15.6	15.6	0.0
C19	615250.7	157214.1	16.6	16.7	0.1
C20	615720.4	156806.5	15.4	15.5	0.1
C21	615611.9	156867	11.9	11.9	0.0
C22	615643	156885.4	14.0	14.0	0.0
C23	615601	156922.7	14.2	14.3	0.1
C24	615526.8	156967.2	18.1	18.2	0.1
C25	615466.5	157032.5	18.4	18.5	0.1
C26	615377.6	157090.5	15.3	15.3	0.0
C27	615352.3	157136.3	17.3	17.3	0.0
C28	615294	157196.6	15.6	15.6	0.0
C29	615276.2	157209.4	16.3	16.4	0.1

1.6 Conclusions

The sensitivity test undertaken along Old Dover Road indicates that the proposed development is unlikely to result in significant impacts in 2044. This is informed by the following considerations:

- Flows on those roads within the AQMA will be lower than those assessed in the sensitivity test, therefore air quality impact at properties within the AQMA would be expected to be lower than those presented at the modelled receptors.
- The assessment utilises 2030 emission rates and background concentrations. It therefore does not take into account the anticipated improvements in air quality in fleet emission rates, government and local policy. The modelled concentrations therefore represent a worst case estimation.
- Even with worst case assumptions, the increase in annual mean NO_2 concentration is marginal and would be categorised as negligible in the context of the impact IAQM descriptors.

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