Satnam Proof of Evidence - **Rebuttal**

Air Quality

Produced by Jim Sullivan

Rule 6 Party

Peel Hall - APP/ M0655/W/17/3178530

Air Quality
Satnam Proof of Evidence Rebuttal

1 INTRODUCTION

1.1 It should be noted that the Rule 6 Party did not find common ground with the Appellant with regard to air quality. The Statement of Common Ground which was proposed by the Appellant was provided very close to the deadline for submission of proofs. There were a significant number of areas of disagreement which were notified to the Appellant but the short timescale, coupled with the fact that the document submitted was in pdf format which did not allow for annotations, meant that the most pragmatic way forward was for the LPA and the Appellant to record their points of agreement. Accordingly, the Appellant and the LPA agreed a bipartite SoCG which omitted the Rule 6 Party's views. This should not be seen as any lack of willingness from the Rule 6 Party to find areas of common ground

1.2 Prior to the submission of proofs the Rule 6 Party requested output data from the air quality model. The first two versions of this file contained issues which made the files unusable for purposes of analysis. The Appellant and their consultants were helpful in resolving these issues. We wish to record our gratitude for their courtesy in providing output data from the air quality model. However, the file which was capable of being analysed arrived after proofs had been filed, so this rebuttal includes data which was not available to the Rule 6 Party or the LPA at time of submission of proofs. Please see, also, point 2.18 of this rebuttal, which highlights missing data from the data file supplied.

1.3 There are two data files submitted with this rebuttal. One of these comes direct from the Appellant and has not been altered.

This is labelled 'Peel Hall_Grids_with_without_24082020'.

A second file is included. This is identical to the first, but with the addition of four columns to enable processing and display of key information.

This is labelled 'Peel Hall_Grids_with_without_24082020 Rebuttal'

These Excel files should be viewed in Excel format as printing of the data will not enable analysis.

2 SPECIFIC REBUTTALS

2.1 3.11 (ii) of the Appellant's Proof of Evidence states "*Conservatively, vehicle emission factors have been held at 2019 levels within the assessment for all scenarios. Emissions of pollutants from road vehicles are expected to decrease each year due to factors such as improvements brought about by tighter vehicle emission regulations, technology conversions in the national fleet, replacement of older vehicles, electric vehicles and improvements in fuel*". We accept that emissions from vehicles should improve, though note that air quality standards would also be expected to improve over a similar time period. It is not possible to predict which of the two variables will change more rapidly over the period in question.

2.2 The Appellant's PoE makes no reference to dust and other air quality issues generated during the 10 year build period. From the application documents we note that no modelling of the NO_2, PM10 or PM2.5 emissions in relation to this ten year build programme has been included in the Appellant's data model.

2.3 3.21 of the Appellant's PoE focuses on "% Change relative to AQAL". We note that this is a measure recommended by the IAQM, but would respectfully highlight the effect which this approach has with regard to compressing the range of percentage variances. Consider R24 as an example within the NO_2 data table in 3.21 of the Appellant's PoE. The change relative to a fixed figure of 40 $\mu g/m^3$ is 1.3%. However, the *actual* change in NO_2 level at this receptor, as a percentage of the 'before development' figure, is 2.24%.

The effect of this measure, then, is to reduce the apparent percentage increase in air pollution. This should be taken into consideration when assessing the evidence provided.

2.4 3.21 of the Appellant's PoE lists a number of receptor sites showing the difference in air quality as either 'slight' or 'negligible', with percentage variances ranging from **0.43%** to **3.58%** for NO_2. When calculated as *actual* variance i.e. based on the original value, the range for NO_2 is **0.47%** to **5.77%**, as shown below:

Receptor	Without Development	With Development	% Change relative to AQAL (Appellant's measure)	% Change
R1	37.16	37.46	0.75	0.81
R2	34.2	35.1	2.25	2.63
R3	36.41	36.58	0.43	0.47
R4	24.8	26.23	3.58	5.77
R5	24.15	24.34	0.48	0.79
R6	23.07	23.33	0.65	1.13
R7	24.05	24.88	2.08	3.45
R8	25.28	26.06	1.95	3.09
R9	25.96	26.18	0.55	0.85
R10	28.3	28.54	0.6	0.85
R11	24.47	25.13	1.65	2.7
R12	25.1	26.49	3.47	5.54

R13	25.68	26.78	2.75	4.28
R14	26.48	26.76	0.7	1.06
R15	26.13	26.4	0.67	1.03
R16	26.01	26.37	0.9	1.38
R17	26.7	27.35	1.63	2.43
R18	35.39	35.7	0.78	0.88
R19	30.46	30.84	0.95	1.25
R20	32.55	32.62	0.18	0.22
R21	27.97	28.08	0.27	0.39
R22	25.17	25.48	0.77	1.23
R23	23.28	24.18	2.25	3.87
R24	23.18	23.7	1.3	2.24

2.5 Notwithstanding our concerns about the use of this specific measure (% Change relative to AQAL) we have used it throughout our rebuttal to provide consistency. It should be noted that the points raised below are, therefore, conservative in nature.

2.6 The 24 data points provided by the Appellant in 3.21 represent only a very small subset of the values calculated by the Appellant's air quality model. Following correspondence between the Rule 6 Party and the Appellant, an Excel datafile containing 12,982 modelled data points was kindly provided by the Appellant's consultants.

This file is enclosed as 'Peel Hall_Grids_with_without_24082020'. The file 'Peel Hall_Grids_with_without_24082020 Rebuttal' is identical but with the addition of columns T, U, V and W to the 'pairs' tab which displays the information provided with the benefit of some additional processing, discussed below.

2.7 Column T highlights any locations where the increase in NO_2, as expressed by the Appellant's preferred measure – as a % Change relative to AQAL – exceeds **5% increase**. There are **1,141** locations where this is the case.

2.8 Column U highlights any locations where the increase in NO_2, as expressed by the Appellant's preferred measure – as a % Change relative to AQAL – exceeds **10% increase**. There are **251** locations where this is the case.

2.9 Column V replicates the NO2 figures without development and column W replicates the NO2 figures with development. In both cases, values above 40 $\mu g/m^3$ are highlighted in yellow. It can be seen that there are **3,268** locations where the NO_2 levels are modelled to exceed 40 $\mu g/m^3$ after development.

2.10 The following locations are particularly significant, in that they show **195** locations where NO_2 levels are below the 40 $\mu g/m^3$ level **before** development, and **above** the 40 $\mu g/m^3$ level **following** development. **That is, these are locations where the national guidelines are not currently breached, but *would* be breached following development:**

Row 931 359718.66, 390899.28

Row 1783 360272.53, 391008.84

Row 1818 360283.41, 390969.88

Row 1860 360293.97, 391890.16

Row 1911	360297.75, 391274.19
Row 1923	360298.91, 391258.78
Row 1930	360299.53, 391028.78
Row 1993	360309.16, 391174.53
Row 2261	360332.59, 390930.22
Row 2566	360355.75, 391700.38
Row 2641	360361.25, 392266.31
Row 2913	360375.66, 390691.94
Row 2968	360379.34, 391829.06
Row 3505	360414.78, 392500.72
Row 3524	360416.03, 392525.78
Row 3537	360416.72, 392423.28
Row 3552	360417.5, 392427.44
Row 3620	360422.59, 390516.28
Row 3671	360426.03, 390504.81
Row 3755	360429.59, 390493.19
Row 3781	360431.06, 391897.06
Row 3813	360433.41, 390480.91
Row 3827	360434.25, 391971.34
Row 3864	360437.19, 390999.16
Row 4102	360455.25, 391887.97
Row 4366	360478.91, 390300.72
Row 4541	360497.84, 390286.12
Row 5015	360548.62, 390344
Row 5151	360561.34, 390299.47
Row 5200	360566.53, 390183.03
Row 5238	360570.41, 390169.75
Row 5272	360573.62, 390157.38
Row 5310	360576.47, 390145
Row 5313	360576.69, 389889.62
Row 5314	360576.78, 389965.16
Row 5316	360576.91, 389931.62

Row 5344	360578.78, 390133.69
Row 5358	360580.38, 389969.03
Row 5359	360580.38, 390123.59
Row 5419	360585.91, 389841.72
Row 5423	360586.31, 389889.59
Row 5427	360586.53, 389931.56
Row 5430	360586.75, 389609.59
Row 5490	360589.97, 389656.06
Row 5492	360590.09, 389700.59
Row 5499	360590.5, 389748.31
Row 5501	360590.62, 389746.06
Row 5506	360590.91, 389793.12
Row 5534	360593.44, 390083.47
Row 5657	360606.66, 391905.53
Row 7351	360934.91, 390891.03
Row 7401	360938.84, 391991.62
Row 7451	360945.34, 390873.44
Row 7453	360946.12, 390872.12
Row 7567	360963, 391993
Row 8988	361452.88, 390163.97
Row 9201	361543.34, 390133.28
Row 9241	361567.38, 390128.59
Row 10085	361824.12, 390558.31
Row 10087	361824.25, 390558.03
Row 10097	361826.75, 390560.25
Row 10101	361827.28, 390559.59
Row 10113	361831.12, 390565.28
Row 10115	361831.31, 390562.19
Row 10117	361832.12, 390563.72
Row 10126	361834.12, 390564.03
Row 10128	361834.41, 390568.06
Row 10135	361835.88, 390565

Row 10137	361836.41, 390568.94
Row 10138	361836.47, 390568.78
Row 10143	361837.53, 390567.22
Row 10145	361837.72, 390565.78
Row 10155	361839, 390569.91
Row 10160	361839.5, 390570.97
Row 10168	361840.12, 390566.69
Row 10187	361840.56, 390572.44
Row 10202	361840.75, 390569.53
Row 10204	361841.09, 390571.56
Row 10205	361841.28, 390572.69
Row 10211	361842.5, 390574.47
Row 10214	361842.72, 390571.5
Row 10215	361842.81, 390570.78
Row 10216	361842.84, 390567.03
Row 10217	361843.25, 390567.38
Row 10221	361843.59, 390576.28
Row 10224	361844.12, 390573.47
Row 10227	361845.06, 390581.44
Row 10229	361845.22, 390575.34
Row 10234	361845.62, 390608.03
Row 10235	361845.69, 390578.69
Row 10237	361846.34, 390592.88
Row 10240	361846.5, 390576.44
Row 10241	361846.59, 390567.72
Row 10247	361847.25, 390574.88
Row 10248	361847.25, 390605.34
Row 10250	361847.59, 390595.31
Row 10252	361848.06, 390573.78
Row 10253	361848.38, 390573.06
Row 10254	361848.91, 390583.88
Row 10255	361848.94, 390585.72

Row 10256	361848.97, 390597.22
Row 10257	361849, 390604.94
Row 10258	361849.03, 390607.47
Row 10259	361849.06, 390582.06
Row 10260	361849.12, 390587.5
Row 10261	361849.12, 390607.28
Row 10262	361849.34, 390601
Row 10263	361849.38, 390601.88
Row 10265	361849.47, 390589.41
Row 10267	361849.91, 390571.28
Row 10268	361849.97, 390570.62
Row 10269	361850, 390567.88
Row 10270	361850, 390608.03
Row 10272	361850.09, 390591.38
Row 10275	361850.25, 390598.72
Row 10279	361850.97, 390593.06
Row 10281	361851.66, 390599.94
Row 10284	361851.94, 390605.75
Row 10285	361852.16, 390594.72
Row 10287	361852.53, 390600.03
Row 10289	361852.69, 390568.19
Row 10290	361853.12, 390595.84
Row 10292	361853.44, 390608
Row 10295	361853.81, 390610.09
Row 10296	361853.97, 390601.75
Row 10297	361854.22, 390596.81
Row 10300	361854.69, 390604.16
Row 10303	361855.44, 390571.94
Row 10309	361855.94, 390606.53
Row 10315	361856.28, 390598.06
Row 10330	361858.16, 390570.22
Row 10334	361858.56, 390599.34

Row 10344	361860.53, 390599.94
Row 10346	361861.16, 390569.06
Row 10356	361862.88, 390600.28
Row 10364	361865.03, 390568.66
Row 10369	361865.38, 390600.31
Row 10378	361868.22, 390600.03
Row 10380	361868.94, 390568.97
Row 10387	361870.56, 390599.41
Row 10396	361872, 390570.16
Row 10404	361872.97, 390598.25
Row 10413	361873.88, 390596.91
Row 10421	361875.03, 390571.81
Row 10422	361875.03, 390596.94
Row 10458	361876, 390568.5
Row 10462	361876.31, 390568.28
Row 10464	361876.78, 390595.25
Row 10469	361877.44, 390574.12
Row 10470	361877.59, 390568.81
Row 10487	361879.09, 390576.44
Row 10494	361880.34, 390579.59
Row 10495	361880.38, 390571.44
Row 10501	361880.75, 390587.94
Row 10504	361881.03, 390582.91
Row 10507	361881.16, 390585.56
Row 10516	361882.34, 390603.12
Row 10519	361882.47, 390600.88
Row 10520	361882.59, 390574.56
Row 10521	361882.69, 390597
Row 10532	361883.91, 390600.69
Row 10534	361884.16, 390578.53
Row 10543	361884.97, 390582.47
Row 10548	361885.59, 390603.56

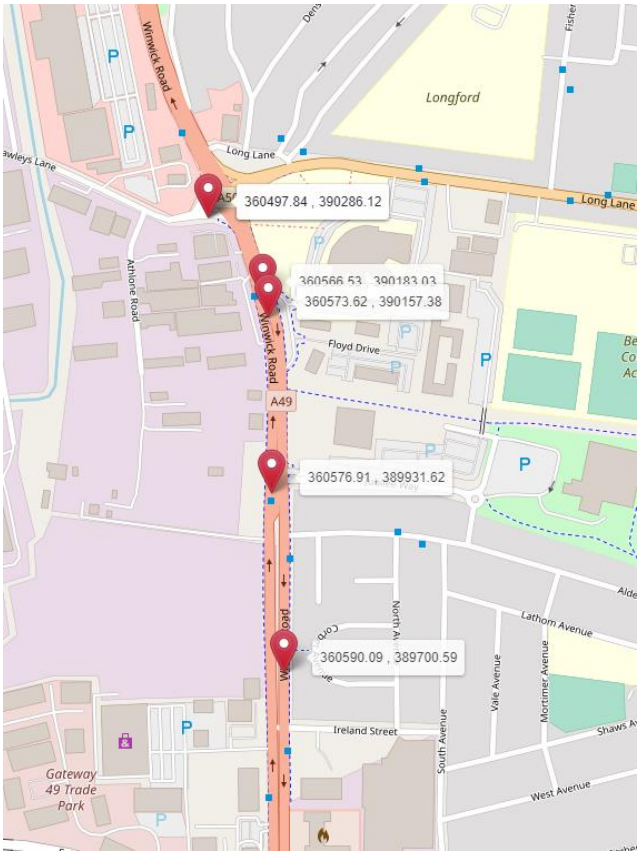
Row 10549	361885.75, 390602.81
Row 10550	361885.75, 390602.88
Row 10551	361886.09, 390601.38
Row 10553	361886.97, 390604.09
Row 10554	361887, 390597.59
Row 10555	361887.31, 390598.03
Row 10556	361887.34, 390599.47
Row 10557	361887.41, 390593.59
Row 10567	361888.75, 390599.69
Row 10568	361888.91, 390596.81
Row 10570	361889, 390604.59
Row 10574	361889.31, 390596.47
Row 10577	361889.75, 390602.47
Row 10580	361890.03, 390601.03
Row 10592	361891.94, 390602.72
Row 10600	361893.69, 390604.03
Row 10602	361894.25, 390606.38
Row 10604	361895, 390604.25
Row 10606	361895.47, 390605.09
Row 10612	361896.44, 390606.12
Row 12083	362399.88, 391606.88
Row 12432	362510.69, 391167.25
Row 12483	362521.19, 391100.44
Row 12488	362522.16, 391098.22
Row 12495	362523.47, 391096.78
Row 12500	362524.16, 391095.94
Row 12502	362524.53, 391095.56
Row 12506	362525, 391095.31
Row 12513	362526.66, 391094.66
Row 12526	362528.12, 391094.22
Row 12545	362531.25, 391123.72

Where these occur in the spreadsheet the relevant row has been highlighted for ease of checking.

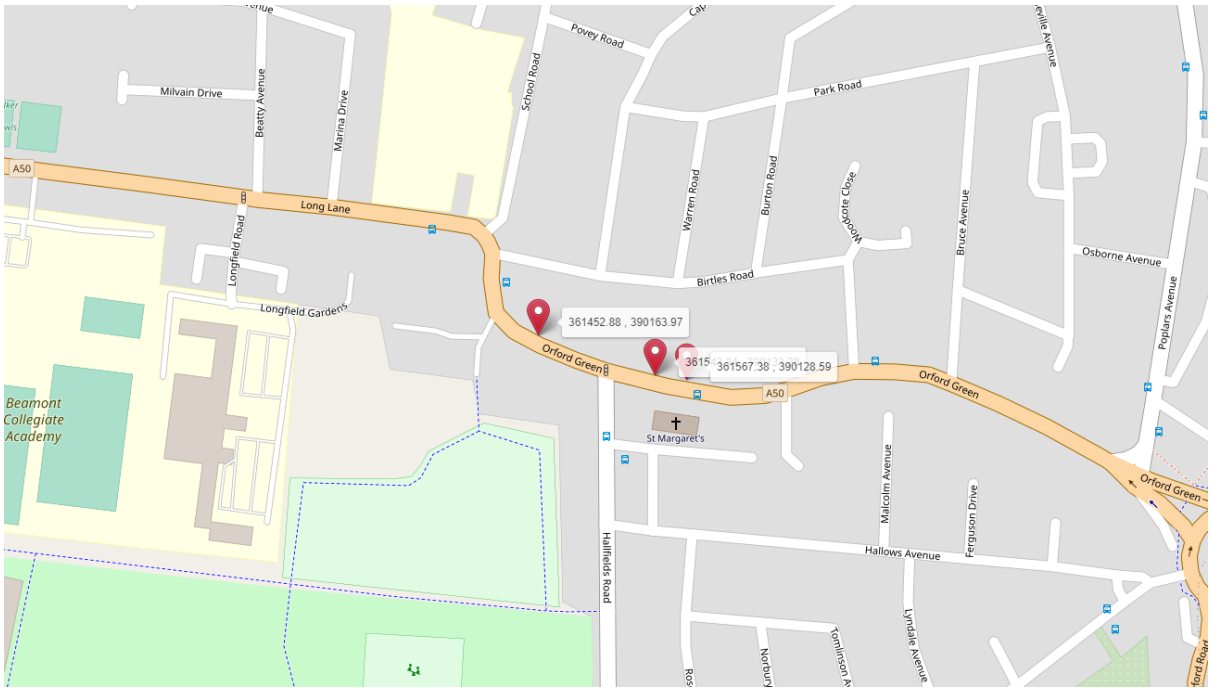
2.11 Locations where AQAL would be breached as a direct consequence of the development.

Some of the locations where the Appellant's data model shows that the 40 µg/m^3 AQAL for NO_2 would be breached following development – despite being below that level before development - have been mapped for convenience, below:

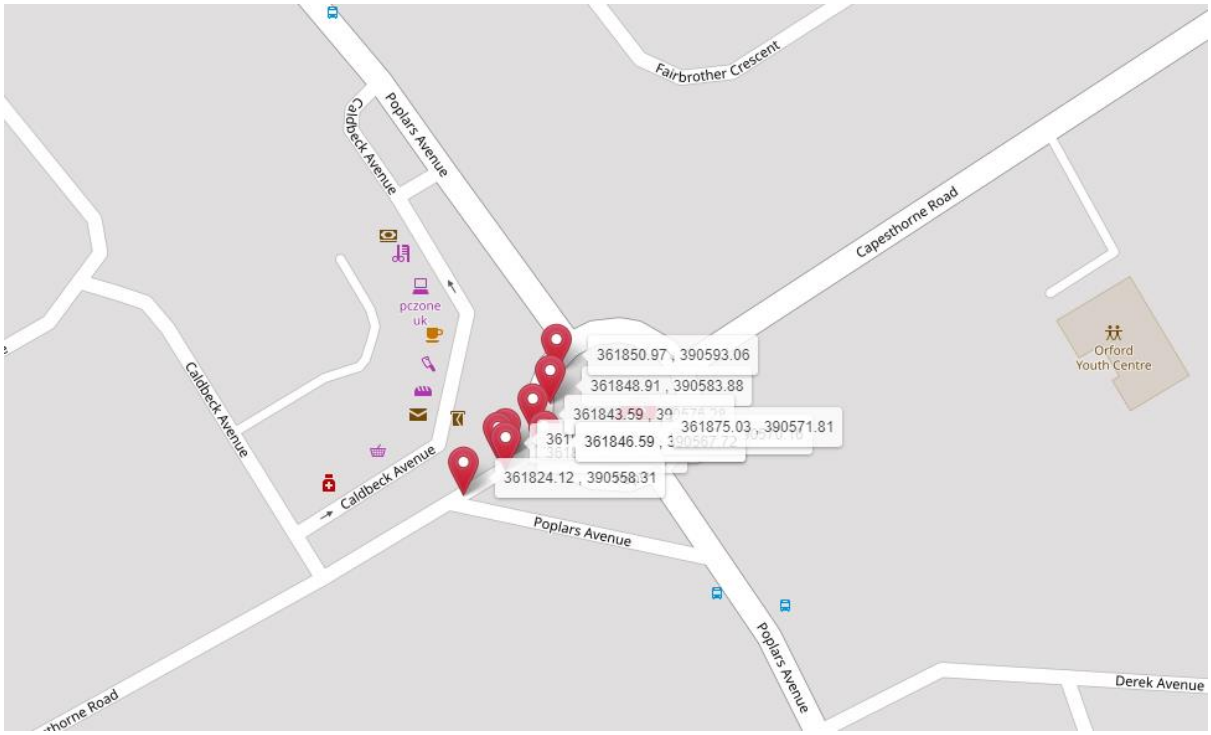
2.12 There is a cluster along the A49, a few of the data points are shown here:



2.13 There is a cluster on Long Lane / Orford Green, next to housing, a church and a secondary school



2.14 The junction of Poplars Avenue with Capesthorne Road:

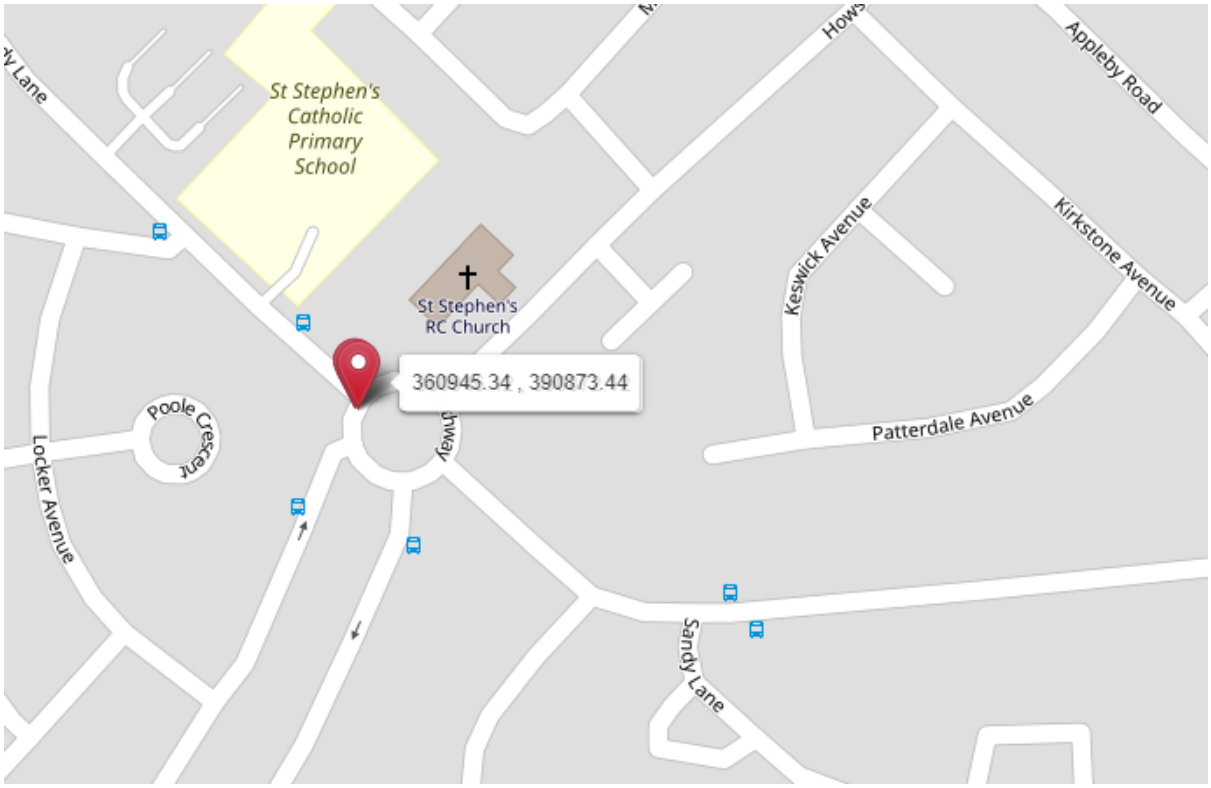


As the satellite image shows, this is a densely populated area:

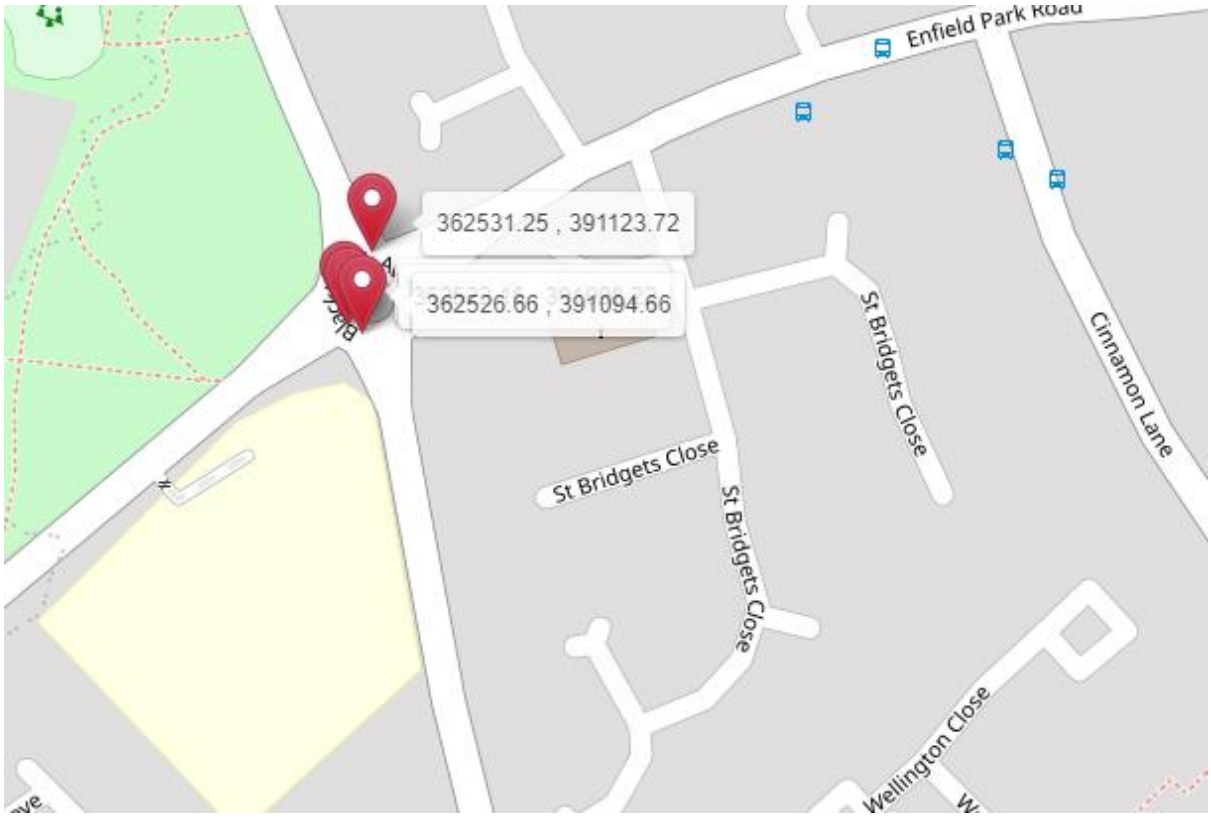
We note 3.23 of the Appellant's PoE, which states: "*Mr Moore raised a query with respect to the contour plots at the roundabout junction of Poplars Avenue and Capesthorne Road and further analysis of this area was undertaken. A single grid point caused the contours to show a circular pattern in concentration due to high pollutant concentrations at the specific grid point location and the surrounding grid spacing. Subsequently, the area has been mapped with finer resolution. The updated contour plot is produced as Appendix 6 of this Proof. It indicates that along small sections of the roads within and leading into the roundabout, NO2 concentrations are predicted to be above 40 µg/m3 . However, the annual average objective does not apply to the areas shown in the plot that are expected to be exposed to NO2 concentrations above 40 µg/m3 as there are no relevant receptors there i.e. no dwellings*".

We would note that this location is densely populated. There are at least 8 grid points showing an increase in NO_2 level to greater than 40 µg/m^3 (where the level had been below 40 µg/m^3 prior to development).

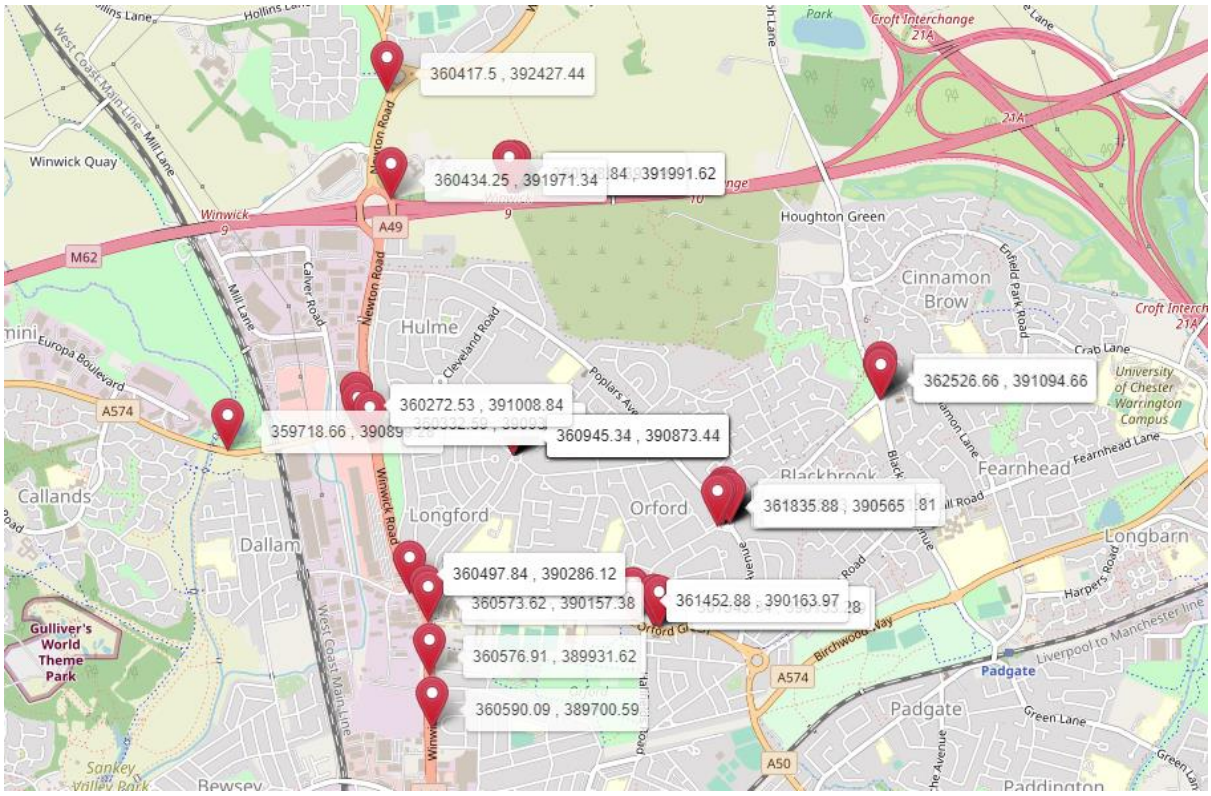
2.15 Sandy Lane; note the proximity of primary school and church:



2.16 Enfield Park Road, adjacent to St Bridget's primary school and mixed-use (C of E and RC) church:



2.17 The general vicinity of Peel Hall. This is not a comprehensive set of locations, merely an illustrative subset. Note that each location marked with a pin is one where the AQAL would be exceeded following development, whereas the location is currently (without development) *below* the AQAL of 40 µg/m^3 :



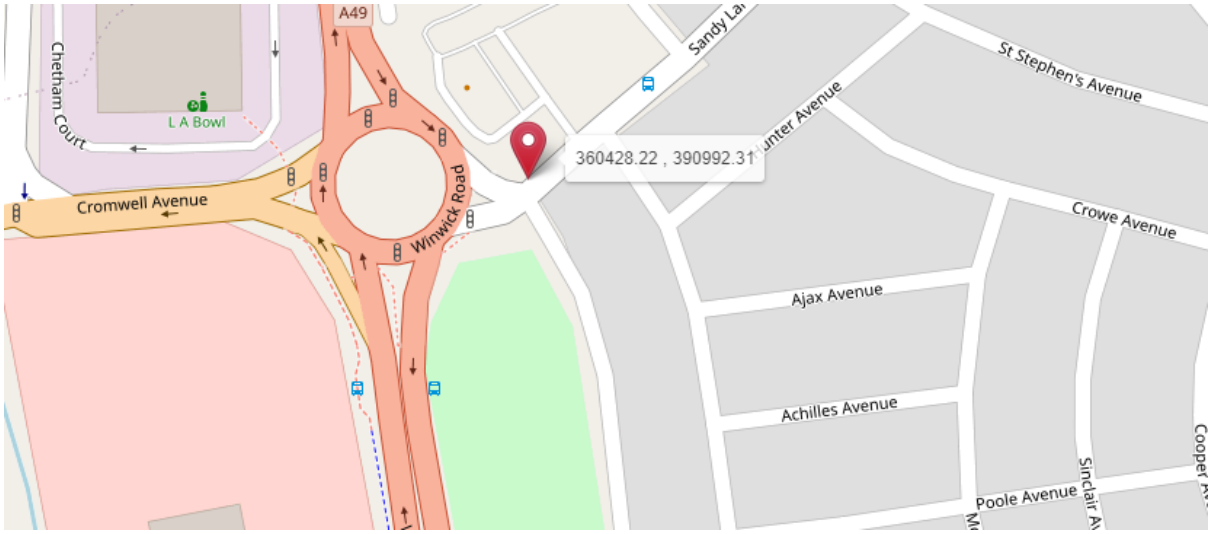
2.18 Table 4 of 3.21 of the Appellant's PoE lists 24 receptor points. These points are **not present** in the output data supplied by the Appellant. It is difficult to understand how this can be the case. A manual search through the data to find corresponding locations has provided some nearby points, but it should be stressed that **not one** of the receptor points listed in Table 4 of 3.21 of the Appellant's PoE is present in the data file provided by the Appellant.

The nearby locations which have been found demonstrate the inadequacy of selecting such a small number of receptor points. Time has only allowed for three of these to be identified within the data, and in each case the IAQM impact statement changes. The data for these three locations is shown below, together with maps so that the inspectorate can consider the degree of proximity:

Receptor	**Without Development**	**With Development**	**Microgram change**	**% change relative to AQAL**	**% of AQAL**	**Impact**
R2	34.2	35.1	0.9	2.25	88	Slight
360428.22, 390992.31	43.66	46.02	2.36	5.9	109	Substantial
R16	26.01	26.37	0.36	0.9	66	Negligible
360934.91, 390891.03	39.09	40.34	1.25	3.125	98	Moderate
R18	35.39	35.7	0.31	0.78	89	Negligible
360511.88, 392524.03	69.22	70.22	1.0	2.5	173	Substantial

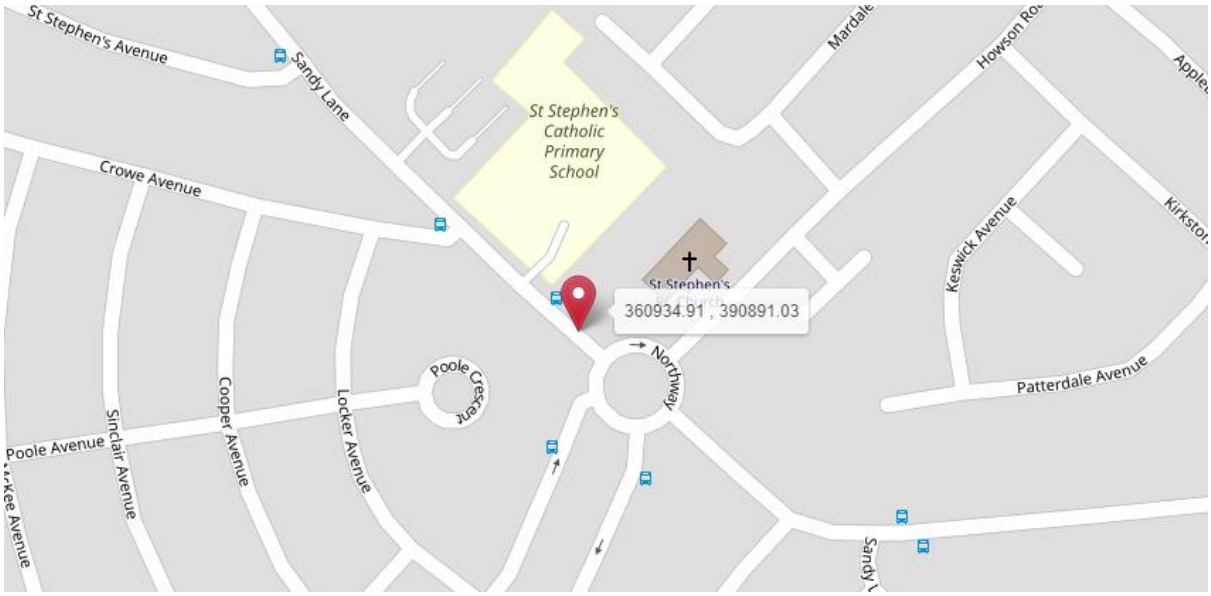
2.19 Location of R2:

Location of 360428.22, 390992.31:

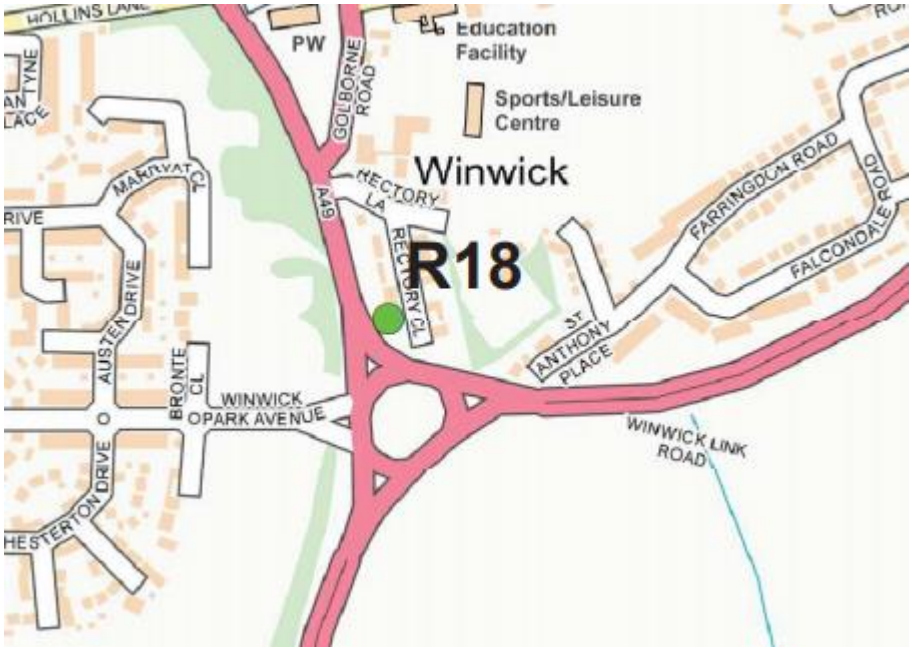


2.20 Location of R16:

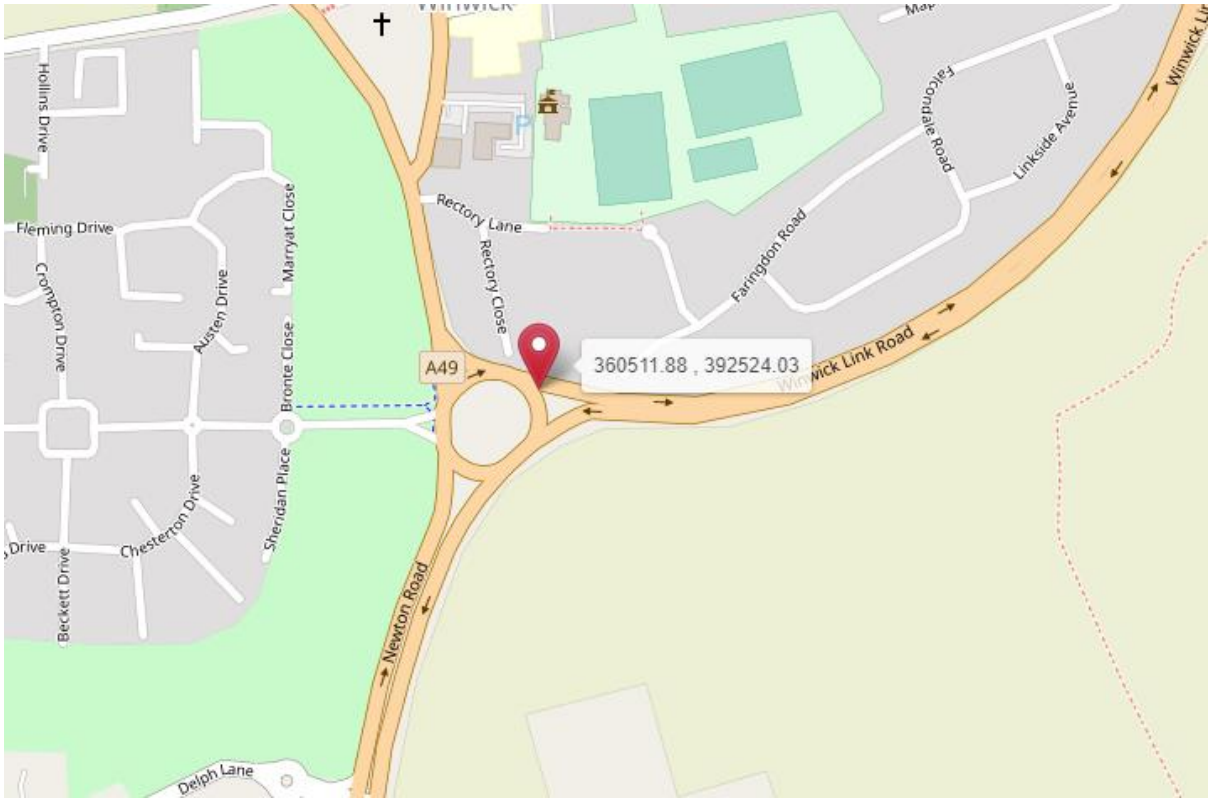
Location of 360934.91, 390891.03:



2.21 Location of receptor 18:



Location of 360511.88, 392524.03:



3 CONCLUSION

3.1 The Appellant claims that "*It indicates that the site itself is suitable for residential use and that there will be no significant impact on local air quality as a result of the development*". This claim is undermined by the data provided by the Appellant. A large number of locations are modelled to move from a position of being below the AQAL for NO_2 before development to exceeding the AQAL following development.

3.2 In 1,141 locations on the Appellant's air quality model, NO_2 levels are more than 5% higher than before the development. In 251 locations NO_2 levels worsen by more than 10%. These percentages are calculated using the Appellant's methodology ie as a percentage of the AQAL. In terms of the actual percentage increase in NO_2 level, the number of locations showing either 5% or 10% worsening is considerably larger.

3.3 We therefore rebut the Appellant's claim in 3.22 of their Proof of Evidence that "*The difference between the "without development" and the "with development" contour plots is barely perceptible except at the roundabout junction of Poplars Avenue and Capesthorne Road*". The locations shown in the maps above are densely populated. The families who live at these locations will move from a position of being below the AQAL to exceeding the AQAL. Families at many other locations will experience NO_2 levels which are more than 10% worse than the current – already high – levels of air pollution experienced.

3.4 The Appellant has not provided a comprehensive dataset for analysis. This is evidenced by the omission of the 24 Receptor points in the datafile provided.

3.5 Manual analysis of the data in locations proximate to the 24 receptor points shows that significant variations are present within a very small distance of the receptor point. The most conservative conclusion which should be drawn from this is that relying on a small number of data points, selected by the Appellant, is not a robust examination of the impact of this development on air quality.

3.6 We would note that the data which has been analysed as part of this rebuttal was not made available to the LPA when receptor locations were proposed by the Appellant. This would appear to be a flaw in process; the LPA would not be able to form any meaningful conclusions about the appropriateness of these specific locations, nor about the overall impact of the proposed development, without the data which was provided on 24th August 2020.