

APPENDIX 11.4
VERIFICATION AND MODEL PROCESSING

Appendix- 11.4 Verification

Model Verification

- 11.1. Modelled results have been verified against known monitored values in close proximity of the site. The verification process has followed the methodology set out in Defra (2018) LAQM TG(16)¹.
- 11.2. The verification approach has been discussed and agreed with the Council's appointed air quality consultant (WYG); the modelled results following verification are comparable to existing dispersion modelling in this area of Hounslow.
- 11.3. The verification sites used in the assessment and the modelled road network are presented in Figure 1 below. 2019 annual mean concentrations for these sites were requested from the Council in the absence of the 2020 Annual Status Report at the time writing this report.



Figure 1 Verification Sites

¹ Department of Environment and Rural Affairs (2018) Local Air Quality Management Technical Guidance (TG16)

11.4. Results from model verification are presented Table 1. Results indicate that the model under-predicts road NO_x contribution, and therefore it is necessary to apply an adjustment factor of 2.9091 (see Figure 2) in order to give more accurate modelled concentrations (Table 2)

11.5. The adjustment factor has subsequently been applied to all modelled road NO_x concentrations. Adjusted NO_x is presented in Figure 3.

Table 1 Model verification results

Monitoring Site ID	Modelled road NO _x	Monitored road NO _x	% Difference
HS67	24.0	70.4	-52.5
HS68	10.2	28.3	-72.4

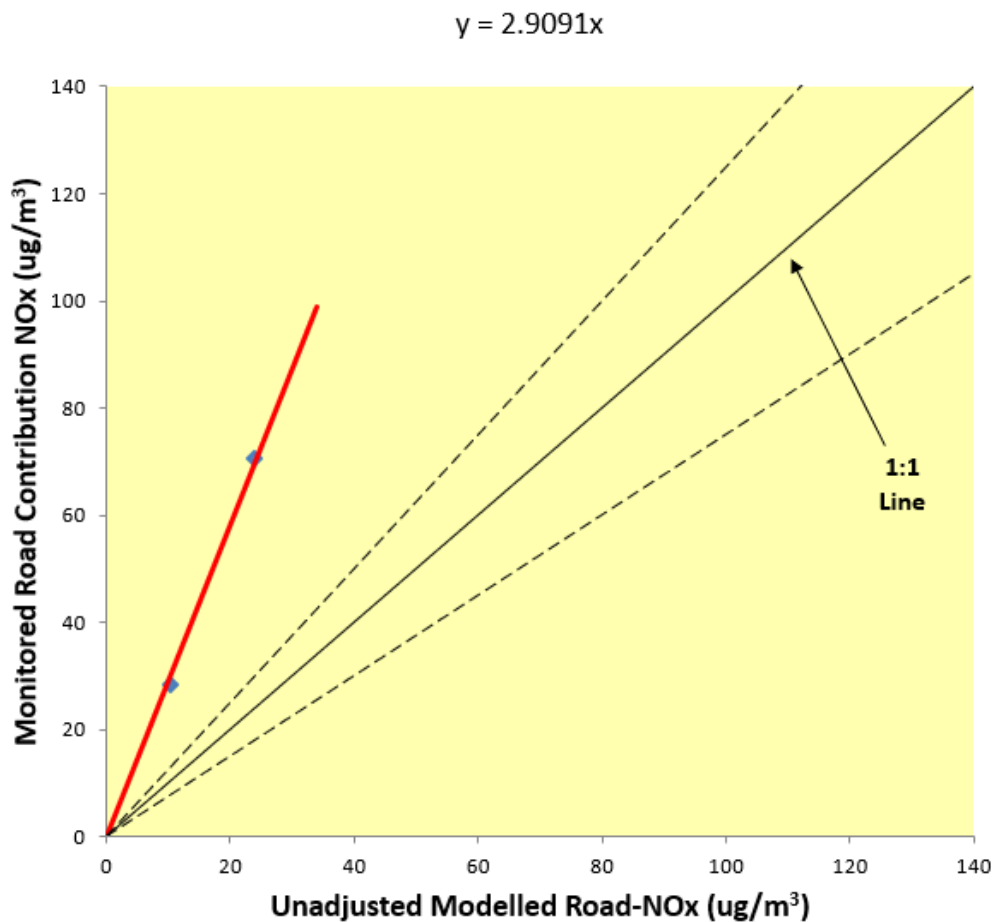


Figure 2 Modelled and monitored road NO_x

Table 2 Adjusted modelled road NOx

Monitoring Site ID	Background		Modelled Road NOx	Monitored Road NOx	Adjusted Modelled Road NOx	% Difference after Adjustment
	NOx	NO ₂				
HS67	33.91	22.26	24.0	70.42	69.8	-0.9
HS68	38.29	24.53	10.2	28.25	29.7	5.2

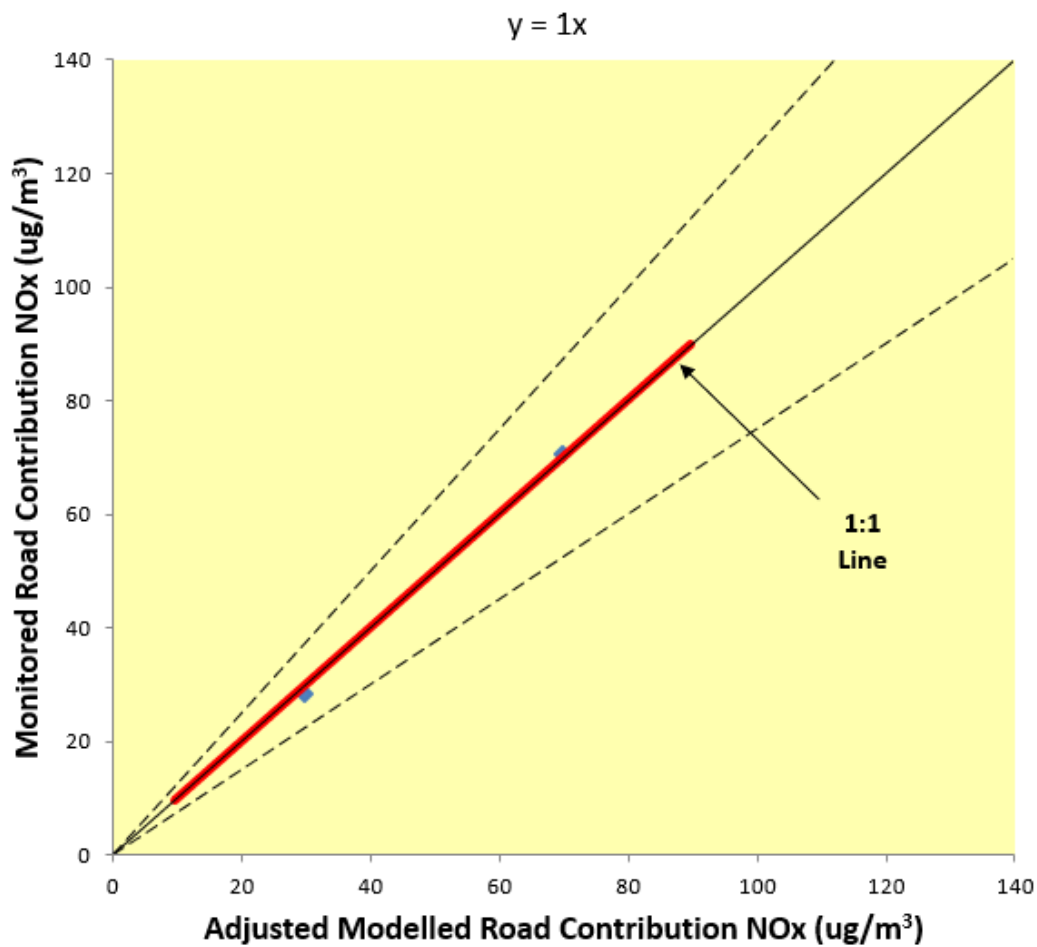


Figure 3 Adjusted modelled road NOx

11.6. It is not common practice to verify point source emissions against existing air quality monitoring data, thus these results have not been verified but instead added to the total concentration in the Do Something (DS) scenario.

Model Post Processing

Road Traffic

- 11.7. The model predicts road-NO_x concentrations at each receptor location. These concentrations have been adjusted using the adjustment factor set out above, which, along with the background NO₂, has been processed through the NO_x to NO₂ calculator available on the Defra LAQM Support website. This calculator predicts the component of NO₂ based on the adjusted road-NO_x and the background NO₂.

Point Sources

- 11.8. The point source modelling has been run to predict the contribution of the proposed boiler emissions to annual mean concentrations of nitrogen oxides, and to the 99.79th percentile of 1-hour mean nitrogen oxides concentrations. For the initial screening of the process contributions, the approach recommended by the Environment Agency (2005) has been used to predict nitrogen dioxide concentrations, assuming that:
- annual mean NO₂ concentration = annual mean NO_x concentration multiplied by 0.7; and
 - 99.79th percentile of 1-hour mean NO₂ concentrations = 99.79th percentile of 1-hour mean NO_x concentrations multiplied by 0.35.