AECOM

Shannon Technology and Energy Park (STEP) Power Plant

Appendix A8.2: Sensitivity Analysis

Shannon LNG Limited

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Appendix A8.2: Sensitivity Analysis

A model sensitivity analysis has been undertaken of various model inputs. The analysis focuses on the Normal Operational Scenario and quantifies the variance in model outputs to long-term (annual mean) and short-term (hourly mean) contributions, after the alteration to the following model parameters at the worst affected receptor (R26 for long-term contribution, R19 for short-term contribution):

- Meteorological Data.
- Building downwash module.
- Terrain module.
- Variable Surface Roughness file.

The results of the sensitivity analysis are provided in **Table A8.2.1** and **Table A8.2.2**. The tables present a comparison of outputs relating to parameter alterations against the inputs used to inform the main assessment.

Table A8.2.1: Model Sensitivity Analysis – Meteorological Data

| | Meteorological Data | | | | |
	2019	2020	2021	2022	2023
Long-term Contribution	100%	95%	99%	92%	83%
Short-term Contribution	94%	99%	98%	100%	100%

Table B.2: Model Sensitivity Analysis – Building, Terrain and Surface Roughness

| | Input Parameters | | | | |
	As Modelled	No Buildings	No Terrain	No Variable Surface Roughness[1]	No Buildings, Terrain or Variable Surface Roughness[1]
Long-term Contribution	100%	69% (-31%)	71% (-29%)	79% (-21%)	47% (-53%)
Short-term Contribution	100%	79% (-21%)	59% (-41%)	71% (-29%)	38% (-62%)

[1] *Alternative to variable surface roughness file is to assume a surface roughness of 0.2m across the study area.*

Table A8.2.1 demonstrates that a change in meteorological data affects long-term (annual mean) contributions to a larger extent than short-term (hourly mean) contributions. For long-term, 2019 is the worst year at the worst affected receptor, with 2022 seeing the lowest reduction (-1%) and 2022 the greatest (-8%). For short-term, 2023 is marginally the worst year at the worst affected receptor, with 2022 seeing the lowest reduction (<-1%) and 2019 the greatest (-6%).

Table A8.2.2 demonstrates that omitting any one of the model parameters considered in the sensitivity test has notable effect on the source contributions reported at the worst affected discrete receptor locations. The long-term model is most sensitive to the influence of buildings and the short-term model is most sensitive to the influence of terrain data. This sensitivity test suggests that the model inputs make the model more precautionary.