

APPENDIX 8.9

8.9.1 Air Quality Helicopter Risk Assessment

During the course of the assessment of the planning application by An Bord Pleanála (the Board) the Department of Defence raised concerns about potential impacts on Air Corps operations at the Haulbowline Naval Base from the stack plume. As outlined below, this report confirms that the extent of plume in terms of risk levels of oxygen, vertical velocity and temperature is limited to a region much lower than 150m and thus this report confirms that there will be no impact on Air Corps operations. Other submissions were also received by the Board which raised the following matters:

- The plume modelling was undertaken using ADMS whereas AERMOD was used in the EIS,
- The modelling ignored the vertical extent of the plume,
- The vertical extent of the vertical velocity, temperature and oxygen has been underestimated,
- The meteorological data used in the model (Cork Airport) is not appropriate,
- The effect of plume dispersion due to the wind turbine has not been assessed,
- The effect of the velocity deficit of the wind turbine and associated eddy currents (turbulence) has not been assessed.

These issues, in so far as they relate to air quality, have been addressed below.

8.9.2 ADMS vs AERMOD Air Dispersion Models

Both ADMS and AERMOD are given equal weighting by the EPA in the guidance document “*Air Dispersion Modelling From Industrial Installations Guidance Note*” (EPA, 2010). However, ADMS has several advantages over AERMOD in terms of determining the parameters of interest (vertical velocity, temperature and oxygen):

Vertical Velocity

- AERMOD does not produce the parameters required to determine the vertical velocity (change in vertical height of plume with time) and thus cannot be used to determine vertical velocity. ADMS does have this capability and thus was selected to undertake the study of the change in vertical velocity with height.

Temperature

- AERMOD cannot track the path of the plume with distance from the stack for the parameters of interest for each hour of the year. ADMS produces a .cen file for every hour of the year which outputs the parameters (temperature, concentration, change of plume height with distance). Thus, actual direct changes in temperature of the plume could be tracked for every hour of the day downwind of the release.
- A requirement of the temperature assessment is the need to know the ambient temperature for every hour of the year. A submission has suggested that an ambient level of 30°C would be appropriate for every hour of the year. However, this would be a gross over-estimation of reality (i.e. the highest temperature ever recorded at Roches Point is 28°C with an average temperature of 10.5°C). Unfortunately, AERMOD is not formulated to extract, even indirectly, the change in temperature of the plume with distance from the stack on an hourly basis.