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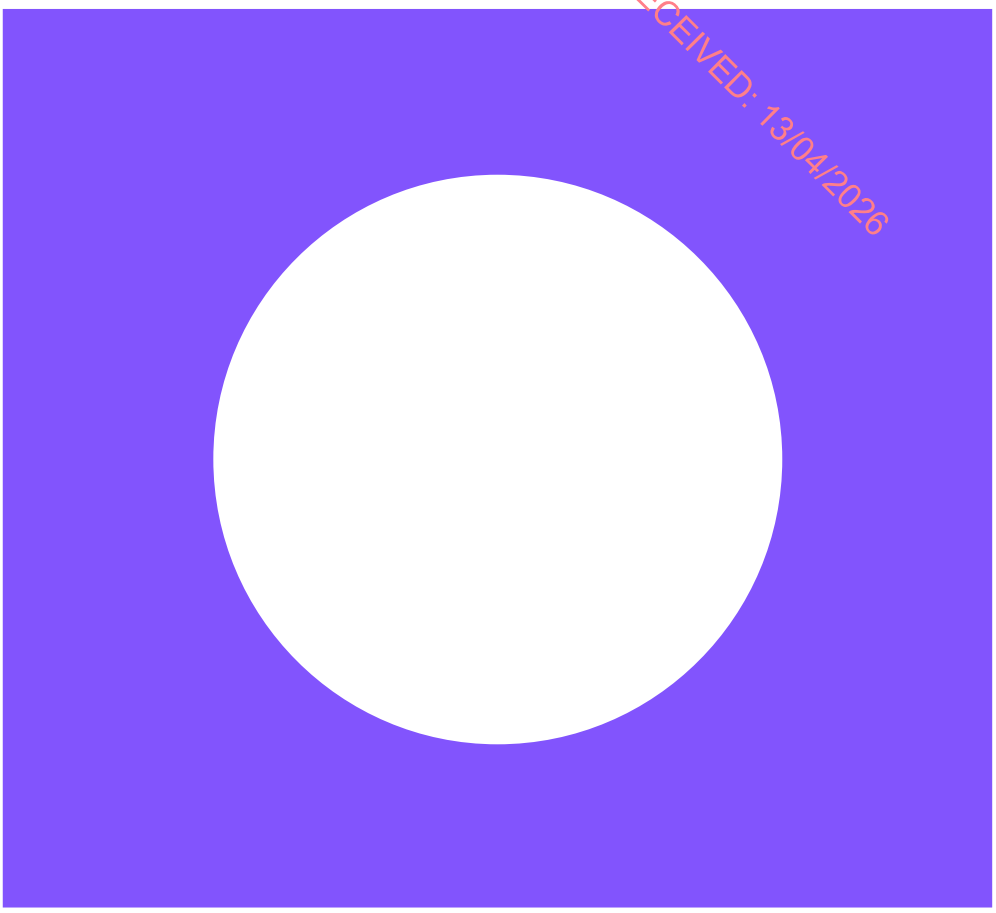

Shelburne Energy Farm Environmental Impact Assessment Report

Chapter 10 Air Quality

April 2026

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Shelburne Energy Farm Environmental Impact Assessment Report

Chapter 10 Air Quality

April 2026

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10 Air Quality

10.1 Introduction

This chapter provides an assessment of the potential effects and likely significance of the Proposed Project on local air quality. The assessment is based on the Proposed Project as described in Chapter 5 – *Description of Development.*

The assessment considers the effects of the Proposed Project at sensitive receptor locations, both human health and ecological, by considering the existing baseline and impacts of the Proposed Project to assess air quality during construction and operation phase. The air quality assessment therefore includes:

- Identification of applicable legislation and emission limits;
- Assessment of existing air quality conditions in the study area;
- Assessment of construction dust and construction road traffic effects;
- Assessment of operation and maintenance road traffic effects; and
- Identification of mitigation measures for both construction and operation and maintenance phases where necessary.

10.2 Policy and Guidance

Policies and guidance documents of potential relevance to the air quality are set out in this section.

10.2.1 National Legislation

10.2.1.1 Ambient Air Quality

Directive 2008/50/EC[1] on Ambient Air Quality and Cleaner Air for Europe was adopted in May 2008 and consolidates previous air quality directives (apart from the Fourth Daughter Directive). This Directive sets out a range of mandatory limit values (LVs) for different pollutants and times by which they are to be achieved for the purpose of protecting human health and the environment by avoiding, reducing or preventing harmful concentrations of air pollutants. The Directive 2008/50/EC was transposed into Irish legislation by the Ambient Air Quality Standards Regulations 2022[2]. The Fourth Daughter Directive sets health-based limits on polycyclic aromatic hydrocarbons, cadmium, arsenic, nickel and mercury, for which there is a requirement to reduce exposure to as low as reasonably achievable.

The Air Quality Standards Regulations 2011[3] implement the Directive 2008/50/EC and define the air quality standards currently applicable in Ireland. These regulations set out upper and lower assessment thresholds for the pollutants of concern. The Air Quality Standards include thresholds to encourage a higher standard of air quality where possible.

Table 10.1 presents the air quality standards and target values for the pollutants relevant to this assessment as prescribed by the EU and Irish legislation, hereafter referred to as air quality

[1] European Union. (April 2008), 'Directive on Ambient Air Quality and cleaner Air for Europe', Directive 2008/50/EC Official Journal, vol. 152, pp. 0001-0044.

[2] Ambient Air Quality Standards Regulations 2022 (S.I. No 739 of 2022)

[3] Air Quality Standards Regulation 2011 (S.I. No. 180 of 2011)

standards (AQS). Standards for the protection of vegetation and ecosystems are referred to as 'critical levels'.

Table 10.1: Relevant Air Quality Standards

Pollutant	Averaging period	AQS / Critical Level (µg/m³)	Allowance	Limit Value Attainment Date
For the protection of human health				
Nitrogen dioxide (NO_2)	1-hour	200	18 times pcy	1 Jan 2010
	Annual	40	–	1 Jan 2010
Particulates (PM_{10})	24-hour	50	35 times pcy	1 Jan 2005
	Annual	40	–	1 Jan 2005
Fine particulates ($PM_{2.5}$)	Annual	20	–	1 Jan 2020
Critical level for the protection of vegetation and ecosystems				
Nitrogen oxides (NO_X)	Annual	30	–	

Source: Environmental Protection Agency Air Quality Standards[4]
Notes: pcy = per calendar year

The AQS presented in Table 10.1 are for the protection of human health and only apply at locations of relevant exposure. The Air Quality Standards Regulations sets out that the limit values (AQS) apply everywhere with the exception of:

a) any locations situated within areas where members of the public do not have access and there is no fixed habitation;
b) in accordance with Article 2(1), on factory premises or at industrial installations to which all relevant provisions concerning health and safety at work apply;
c) on the carriageway of roads; and
d) on the central reservations of roads except where there is normally pedestrian access to the central reservation.

The areas where the critical levels for the protection of vegetation apply are as follows:

a) More than 20 kilometres (km) from an agglomeration (i.e. an area with a population of more than 250,000); and
b) More than 5 kilometres away from other built-up areas, industrial installation or motorways or major roads with traffic counts of more than 50,000 vehicles per day.

10.2.2 National Policy

10.2.2.1 National Air Emission Targets

Directive (EU) 2016/2284 of the European Parliament and of the Council of 14 December 2016 on the reduction of national emissions of certain atmospheric pollutants, amending Directive 2003/35/EC and repealing Directive 2001/81/EC (hereafter referred to as the National Emissions Reduction Directive) was published in December 2016.

The National Emissions Reduction Directive applied the limits set out in Directive 2001/81/EC of the European Parliament and of the Council of 23 October 2001 on national emission ceilings for certain atmospheric pollutants (hereafter referred to as the National Emission Ceiling

[4] Environmental Protection Agency (2021). 'Air Quality Standards'. Available at: https://airquality.ie/information/air-quality-standards

Directive) until 2020 and established new national emission reduction commitments which are applicable from 2020 and 2030 for SO_2, NO_X, non-methane volatile organic compounds (NMVOC), ammonia (NH_3), $PM_{2.5}$ and methane (CH_4).

In relation to Ireland, the 2020 to 2029 emission targets are 25 kt (kilotonnes) for SO_2 (65% on 2005 levels), 69kt for NO_X (49% reduction on 2005 levels), 57kt for NMVOCs (25% reduction on 2005 levels), 118 kt for NH_3 (1% reduction on 2005 levels) and 15 kt for $PM_{2.5}$ (18% reduction on 2005 levels) as shown in Table 10.2. In relation to 2030, Ireland's emission targets are 85% below 2005 levels for SO_2, 69% reduction for NO_x, 32% reduction for VOCs, 5% reduction for NH_3 and 41% reduction for $PM_{2.5}$, also shown in Table 10.2.

The report Ireland's Air Pollutant Emissions 1990 – 2030[5] discusses the outlook for future compliance with 2030 targets. It notes that SO_2, NO_x, NH_3 and $PM_{2.5}$ targets are projected to be met in 2030 with existing policies and measures, however no measures have yet been set to ensure compliance with NMVOC emission ceiling for 2030.

Table 10.2: National Air Emission Target (Ireland Air Pollutant Emissions 2020 to 2030)

Pollutant	2020 to 2029 Reduction Commitments (kt) (and % Reduction Compared to 2005 Levels)	2030 Reduction Commitments (kt) (and % Reduction Compared to 2005 Levels)
SO_2	25.5	11.0
	-65%	-85%
NO_X	69.0	42.0
	-49%	-69%
NMVOC	57.0	51.6
	-25%	-32%
NH_3	118.4	113.6
	-1%	-5%
$PM_{2.5}$	15.5	11.2
	-18%	-41%

Source: Ireland's Air Pollutant Emissions 1990-2030.

10.2.2.2 Clean Air Strategy

The Clean Air Strategy was published in April 2023[6] and provides the high-level strategic policy framework to identify and promote the integrated measures across government policy that are required to reduce air pollution and promote cleaner ambient air, while delivering on wider national objectives. The strategy commits Ireland to achieving the new World Health Organisation (WHO) guideline values for air quality by 2040, with progress to be measured against interim targets by 2026 and 2030. This Strategy sets out seven strategic frameworks includes:

- Targeted policy measures
- Ambition and strong governance

[5] Environmental Protection Agency (2022), Ireland's Air Pollutant Emissions – 1990-2030. Available at: https://www.epa.ie/publications/monitoring--assessment/climate-change/air-emissions/EPA-Irelands-Air-Pollutant-Emissions-report_2021Final.pdf (accessed 23 February 2024)

[6] Department of the Environment, Climate and Communications; Clean Air Strategy. Available at: https://www.gov.ie/en/press-release/aa501-government-approves-irelands-first-ever-clean-air-strategy/#:~:text=The%20new%20Clean%20Air%20Strategy,polluting%20fossil%20fuels%2C%20for%20example.

- Policy developments
- Legislation
- Enforcement
- Monitoring
- Communications

The aims of these key strategic frameworks are:

- To set the appropriate targets and limits to ensure continuous improvements in air quality across the country, to deliver health benefits for all.
- To ensure the integration of clean air considerations into policy development across Government.
- To increase the evidence base that will help us to continue to evolve our understanding of the sources of pollution and their impacts on health, in order to address them more effectively.
- To enhance regulation required to deliver improvements across all pollutants.
- To improve the effectiveness of our enforcement systems.
- To promote and increase awareness of the importance of clean air, and the links between cleaner air and better health.
- To develop the additional targeted/specific policy measures as required to deal with national or local air quality issues.

10.2.3 Local Policy

The Proposed Project lies within the local government area of Wexford County Council, which has the potential to be affected by air quality impacts. Local government objectives on air quality, where relevant to the Proposed Project, are summarised below.

10.2.3.1 Wexford County Development Plan 2022-2028

The following objectives are of relevance to air quality and renewable energy developments:

Environmental Management Objective EM05, which states that:

- "*To implement the provisions of EU and National legislation and other relevant legislative requirements on protecting and improving surface and ground water quality, air quality and climate, and on reducing adverse noise and light nuisance, as appropriate and in conjunction with all relevant stakeholders in the interests of the protection of the environment, public health and the sustainable development of the county.*"

Air Quality Objectives AQ01 and AQ03, which state that:

- AQ01: "*To have regard to the Air Quality Standards Regulation 2011 (S.I. No. 180 of 2011) when assessing planning applications for development which may have effects on air quality.*"
- AQ03: *"To manage development to provide the efficient use of land and infrastructure, thereby controlling and limiting air emissions."*

Climate Action Objective CA16, which states that:

- *"To support change across business, public and residential sectors to achieve reduced greenhouse gas emissions in accordance with current and future national targets, improve energy efficiency and increase the use of renewable energy sources across the key sectors of electricity supply, heating, transport and agriculture."*

Green Economy Objective ED85, which states that:

- *"To develop the county as a leading innovator in the green economy in areas such as sustainable agriculture, sustainable construction, the production of renewable energy and the bio-economy, and to support development of enterprises and technologies that employ green technologies and support a low carbon economy."*

Power Transmission Objective PT02, which states that:

- *"To support, subject to the objectives of this section and Volume 10 Energy Strategy, connecting infrastructure for the integration of low carbon and renewable energy generation projects including community scaled projects with power transmission infrastructure. To support, subject to the objectives of this section and Volume 10 Energy Strategy, connecting infrastructure for the integration of low carbon and renewable energy generation projects including community scaled projects with power transmission infrastructure."*

10.2.4 Guidance

In addition to the specific statutory air quality standards, the assessment has referred to national guidelines, where available, in addition to international standards and guidelines relating to the assessment of ambient air quality impacts. These are summarised below:

- Institute of Air Quality Management's (IAQM) 'Guidance on the assessment of dust from demolition and construction', January 2024[7]
- Environmental Protection UK and Institute of Air Quality Management (2017), 'Land-Use Planning and Development Control: Planning for Air Quality'[8]
- Transport Infrastructure Ireland (TII) 'Air Quality Assessment of Proposed National Roads – Standards', December 2022[9],
- TII 'Air Quality Assessment of Specified Infrastructure Projects – Overarching Technical Document', December 2022[10].

10.3 Methodology

10.3.1 Approach to Data Collection

The air quality assessment has been based on the information as presented in Table 10.3.

Table 10.3: Data Sources for air quality assessment

Data source	Date	Data contents
Project team	June 2025	Boundary of Proposed Project
Project team	July 2025	Estimate of construction information for screening of need of assessment
Project team	July 2025	Estimate of construction traffic for screening of need of assessment
Environmental Protection Agency (EPA) [15]	June 2024	Ambient air quality monitoring

[7] Institute of Air Quality Management (January 2024 (Version 2.2)). 'Guidance on the assessment of dust from demolition and construction.'

[8] Environmental Protection UK and Institute of Air Quality Management (2017), 'Land-Use Planning and Development Control: Planning for Air Quality'

[9] Transport Infrastructure Ireland (December 2022), 'Air Quality Assessment of Proposed National Roads – Standard'. Accessible at: https://www.tiipublications.ie/advanced-search/results/document/?id=3218

[10] Transport Infrastructure Ireland (December 2022), 'Air Quality Assessment of Specified Infrastructure Projects – Overarching Technical Document'. Accessible at: https://www.tiipublications.ie/library/PE-ENV-01106-01.pdf

10.3.2 Approach to Impact Assessment

10.3.2.1 Construction Phase Methodology

Construction Dust Emissions

Construction activities can result in temporary effects from dust. Dust is a generic term and usually refers to particulate matter in the size range of 1-75 microns in diameter. The most common effects from dust emissions are soiling and increased ambient PM_{10} concentration. Dust can arise from numerous construction activities such as concrete batching, piling, rock breaking, wind erosion on material stockpiles and earth moving. It can be mechanically transported either via wind or through the movements of vehicles onto public roads (transport of debris on vehicle wheels or uncovered loads).

The IAQM guidance[7] recommends splitting the construction activities into four separate source categories, as listed below, and determining the dust risk associated with each of these individually. Each assessment has determined the risk of each of the following categories:

- Demolition
- Earthworks
- Construction
- Trackout[11].

The risk of each source for dust effects can be described as 'negligible, 'low risk', 'medium risk' and 'high risk' depending on the nature and scale of the construction activities and the proximity of sensitive receptors to the construction activities or site boundary. Each assessment is used to identify the mitigation measures proportional to the level of risk to reduce the effects such that they are not significant.

The assessment considers three separate effects from dust:

- Annoyance due to dust soiling
- Harm to ecological receptors with account being taken of the sensitivity of the area that may experience these effects; and
- Risk of human effects due to increased exposure to PM_{10}.

As per the IAQM guidance, Step 1 of the assessment applies screening criteria to the Proposed project which states that an assessment will be required where there is:

- A 'human receptor' within:
  - 250m of the boundary of the site; and/or
  - 50m of the route(s) used by construction vehicles on the public highway up to 250m from the site entrance(s)
- An 'ecological receptor' within
  - 50m of the boundary of the site; and/or
  - 50m of the route(s) used by construction vehicles on the public highway up to 250m from the site entrance(s).

[11] Trackout = "The transport of dust and dirt from the construction/demolition site onto the public road network, where it may be deposited and then re-suspended by vehicles using the network. This arises when heavy duty vehicles (HDVs) leave the construction/ demolition site with dusty materials, which may then spill onto the road, and/or when HDVs transfer dust and dirt onto the road having travelled over muddy ground on site" as defined by the IAQM guidance on the assessment of dust from demolition and construction.

No further assessment is required if there are no receptors within the defined boundaries.

To assess the likely dust risk, the need to quantify the overall dust emission magnitude ('small', 'medium' or 'large') from each of the dust sources identified (demolition, earthworks, construction and trackout) is first established in alignment with the criteria provided in Table A.1 in Appendix 10.1.

The sensitivity of receptors is then defined (as 'high', 'medium' or 'low') for each dust effect (dust soiling, human health and ecosystem impacts) and the sensitivity of the surrounding area determined for each activity. The sensitivity of the area is based on the distance of the source to the closest receptors, the receptors sensitivity and in the case of PM_{10} effects, the local background concentration, as outlined in Table A.2 to Table A.5 in Appendix 10.1. The highest level of area sensitivity defined for dust effect has been used in each assessment.

The final step of the assessment combines the dust emission magnitude and the sensitivity of the area to determine the dust risk categories for each activity for dust soiling and health effects, as outlined in Table A.6 to Table A.9 in Appendix 10.1.

The dust risk category defined for each dust source and effect is then used to determine appropriate site-specific mitigation measures to be adopted. It should be noted that, in line with the recommendations of IAQM guidance, significance is only assigned to construction effects following mitigation. To determination of the significance effects, as recommended in the IAQM guidance, implementation of proportional and appropriate mitigation measures should result in construction dust having a negligible impact on air quality and the overall effect being not significant. There may be some cases, for example, there is inadequate access to water for dust suppression to be effective, and even with other mitigation measures in place there may be a significant effect. Results of the dust assessment are presented in Section 10.5.

Construction Site Plant and Machinery Emissions

Construction requires the use of different equipment such as excavator, cranes and onsite generators. All construction plants have an energy demand with some resulting in direct emission to air from exhausts. The IAQM guidance notes that the exhaust emissions from onsite plant and site traffic suggests that they are unlikely to make a significant impact on local air quality. The effects of plant emissions on local air quality are not considered significant as emissions are small and air quality monitoring, presented in Section 10.4.2, shows monitored NO_2 and PM concentrations are well below the AQS. Construction plant emissions have therefore not been assessed further with respect to air quality. However, mitigation measures to reduce the effects on local air quality are presented in Section 10.7.

Construction Road Traffic Emissions

There are two relevant screening methods for construction road traffic emissions.

Firstly, the TII guidance *Air Quality Assessment of Proposed National Roads – Standard*[9] and *Air Quality Assessment of Specified Infrastructure Projects – Overarching Technical Document*[10] advises that where construction activities are programmed to last less than six months they are unlikely to constitute a significant air quality effect and can be scoped out of assessment. Where construction activities are programmed to be longer than six months and would change traffic flows by more than the following, the assessment of traffic emissions should be undertaken:

- Change of 1,000 or more of annual average daily traffic (AADT)[12]
- Change of 200 or more of heavy duty vehicles (HDV) [13] expressed as an AADT

[12] Annual average daily traffic

[13] HDVs are vehicles greater than 3.5 tonnes and include buses and coaches

- Change of 10 kilometres or more per hour (kph) expressed as a daily average speed
- Change of 20 kph or more expressed as a peak hour speed

If none of the above criteria are met then the effects of construction traffic on air quality are considered to be not significant.

Secondly, the more stringent Environmental Protection UK and Institute of Air Quality Management (EPUK / IAQM)[8] guidance indicates that an assessment of traffic emissions is only likely to be required for large, long term construction sites that will generate an additional AADT flow of greater than 100 HDVs[13] per day or greater than 500 Light Duty Vehicles (LDV)[14] per day.

The construction period is expected to be 20 – 26 months and it is expected that there would be approximately 52 HDV and 120 LDV vehicle movements (one in / one out) per day. Given the construction traffic generated is well below the TII and EPUK/IAQM criteria and air quality monitoring, presented in Section 10.4.2, shows monitored NO_2 and PM concentrations are well below the AQS, the effects of construction traffic emissions on local air quality are considered to be low and not significant. On this basis, even with more stringent screening, no assessment is required, therefore no further consideration has been given to the effects of construction road traffic on ambient air quality.

10.3.2.2 Operation and Maintenance Phase Methodology

Operational road traffic emissions

As presented in Chapter 5 of this EIAR, during operations, the Proposed project will be monitored and operated remotely by a management team and will be visited regularly by security and/or maintenance personnel. Given the frequency of maintenance, the effects of operation road traffic contributions from the Proposed project are considered of low and not significant.

10.3.3 Study Area

For the construction phase, the study area covers human health receptors and ecologically designated sites within 250m of the construction site boundary and within 50m of the routes used by construction vehicles on the public highway, up to 250m from the site entrances.

As mentioned in Section 10.3.2.2, no further considerations have been given to the effects of operational and maintenance, and construction traffic and construction plant. As such these have not been included in the study area.

10.3.4 Limitations of this EIAR

As discussed in Section 10.4.2, background air concentration data from 2020 and 2021 have the potential to be impacted by effects associated with the coronavirus pandemic such as a reduction in traffic movements resulting in reduced monitored pollutant concentrations. Therefore, data from 2020 and 2021 may not be representative of existing concentrations.

[14] LDVs is refer to cars and small vans less than 3.5 tonnes.

10.4 Receiving Environment

10.4.1 Overview

Information on existing air quality in Ireland can be obtained from the Environmental Protection Agency (EPA) [15] who undertake monitoring at a number of locations across the country. For the purpose of air quality, Ireland is split into four main regions:

- Zone A: Dublin conurbation;
- Zone B: Cork conurbation.
- Zone C: 23 cities and large towns with population >15,000 (Limerick, Galway, Waterford, Drogheda, Dundalk, Bray, Navan, Ennis, Tralee, Kilkenny, Carlow, Naas, Sligo, Newbridge, Mullingar, Wexford, Letterkenny, Athlone, Celbridge, Clonmel, Balbriggan, Greystones, Leixlip and Portlaoise); and
- Zone D: Rural Ireland, i.e. the remainder of the state excluding zones A, B and C.

The Proposed project is located within Zone D. A review of the closest Zone D (rural) most recent monitoring from the EPA highlights that the most representative site is actually the Kilkitt, County Monaghan site. Kilkitt, County Monaghan, located approximately 194.0km to the north of the Proposed Project, has also been presented. This site monitors NO_2, sulphur dioxide and ozone only, however the characteristics and location of this site (inland in a rural background location) makes it the most representative of the conditions found at the Proposed project.

This site, however, does not monitor PM_{10} or $PM_{2.5}$. The closest monitoring site to the Proposed Project that does monitor PM_{10} or $PM_{2.5}$ is located in Zone C monitoring site, located at Paddy Browne's Road in Waterford. Paddy Browne's Road is located approximately 19.9km to the southwest of the Proposed Project. It is an urban background site monitoring NO_2, PM_{10}, $PM_{2.5}$, and ozone. Despite being located the closest to the Proposed Project, the conditions found at this monitoring site are likely to be an overestimate of the concentrations found at the Proposed Project and are presented for reference only for PM_{10} and$PM_{2.5}$.

10.4.2 Representative Monitoring

The location and pollutants measured for both of the Kilkitt and Paddy Browne's Road stations are summarised in Table 10.4.

Table 10.4: Air quality monitoring stations

Site Name	Location		Site Type	Distance from Proposed project	Pollutants monitored	Rationale for reporting
	X	Y				
Paddy Browne's Road, Waterford	658625	610916	Urban background Zone C	19.9	NO_2, PM_{10}, $PM_{2.5}$, and ozone	Closest to Proposed project
Kilkitt, Co. Monaghan	672860	815338	Rural background Zone D	194.0	NO_2, sulphur dioxide and ozone	Closest site that is representative of the conditions found at the Proposed project (rural background)

Source: EPA Air Quality Map. Available at: https://airquality.ie/

Table 10.5 presents the NO_2, PM_{10} and $PM_{2.5}$ monitoring results for these two monitoring sites for 2019 to 2023. Data from 2020 and 2021 have the potential to be impacted by effects

[15] Environmental Protection Agency (2021), 'Air Quality Zones'. Available at; https://airquality.ie/information/air-quality-zones

associated with the coronavirus pandemic such as a reduction in traffic movements resulting in reduced monitored pollutant concentrations. Therefore, data from 2020 and 2021 may not be representative of existing concentrations and is presented for reference only.

Paddy Browne's Road, Waterford, which is considered to be less representative of the conditions at the Proposed Project and an overestimate of expected concentrations, shows that the mean concentrations for all three pollutants are far below the respective AQS for all years. There are also no recorded exceedances of the short-term NO_2 and PM_{10} objective for any of the years.

Kilbitt, County Monaghan, which is considered to be more representative of the conditions found at the Proposed Project, shows that the mean NO_2 concentration is also far below the AQS, with no recorded exceedances of the short-term objective for any years.

Overall, the annual mean concentrations measured at both monitoring sites for the relevant pollutants indicate a decrease of all pollutants between 2019 to 2023. Therefore, based on the above, it is considered that that the annual mean objective for NO_2, PM_{10} and $PM_{2.5}$ is unlikely to be exceeded due to the construction of the Proposed Project.

Table 10.5: Automatic monitoring results

Site Name	Site type	2019 [a]	2020 [a]	2021	2022	2023
NO_2 annual mean concentration (µg/m^3) / Exceedance of the short-term objective (-)						
Paddy Browne's Road, Waterford	Urban background Zone C	8.0 (0)	7.0 (0)	6.6 (0)	7.3 (0)	6.9 (0)
Kilkitt, Co. Monaghan	Rural background Zone D	5.0 (0)	2.0 (0)	2.4 (0)	2.0 (0)	1.7 (0)
PM_{10} annual mean concentration (µg/m^3) / Exceedance of the short-term objective (-)						
Paddy Browne's Road, Waterford	Urban background Zone C	15.0 (0)	14.0 (0)	13.7 (0)	15.2 (0)	12.2 (0)
$PM_{2.5}$ annual mean concentration (µg/m^3)						
Paddy Browne's Road, Waterford	Urban background Zone C	11.0	10.0	9.4	9.9	7.8

Source: EPA Annual Air Quality Reports
Note: Data Capture is >75% for all pollutants in all years presented.
(a) Concentrations presented in report as rounded concentrations.

10.5 Likely Significant Impacts

10.5.1 Do Nothing

Under a 'Do Nothing' scenario, there would be no change to baseline Air Quality. The positive benefits of generating renewable solar energy will not be realised if the Proposed Project is not developed.

10.5.2 Construction Phase

10.5.2.1 Construction Dust Emissions

The magnitude and sensitivity descriptors that have been applied to assess the overall effect of the construction phase are presented in Appendix 10.1. Table 10.6 presents a summary of the dust emission magnitude assigned to each construction activity based on these descriptors.

There are no ecological designated sites within 50m of potential dust sources of the Proposed Project or from roads to be used by construction traffic. The nearest ecological designation is the Boley Fen Natural Heritage Site (NHA) located approximately 1.0km to the south of the

Proposed Project. Therefore, ecological designations are not considered further as part of this assessment.

Table 10.6: Dust emission magnitude

Activity	Dust emission magnitude	Justification
Demolition	N/A	No demolition works associated with this project.
Earthworks	Large	The total site area is estimated to be 121.5 hectares for the solar energy farm, BESS and substation/grid connection. The land being built on is agricultural, therefore is a potential dusty soil type. Earthworks will be required to level the site where the BESS units are located, but not for where the solar farm is located. Underground cables from the transformer station to the terminal substation will be directly buried, except for crossing roads or other services where the cable will be installed in ducts covered in concrete. These cable trenches are to be installed on sections of the L40232 and L4030 on both sides of the road.
Construction	Medium	Materials are expected to have a low-to-medium potential for dust release (concrete, ground mounting frames, metal support structures). The solar energy farm will have photovoltaic panels and modular containerised transformer units. The BESS units are also modular, which minimises on-site construction for both types of units. Underground cabling will be buried in trenches/ducts where crossing roads or other services and covered in concrete (estimated 3780m^3 of concrete for cable trenches). The volume of concrete is expected to be a further 6170m^3 approximately (total of 9950m^3) for the whole site, including the base foundations for the substation. The substation will comprise of a two-storey over partial basement structure, with an estimated total volume of 15,000m^3. As such, the total building volume is expected to be 12,000-75,000m^3, and therefore is medium.
Trackout [16]	Medium	It is estimated that there could be up to approximately 52 heavy goods vehicle movements in a single day (two-way movement- worst case scenario). Internal access tracks will be constructed from compacted gravel surface.

Table 10.7 presents the sensitivity of the receptors to effects caused by construction activities and is based on the criteria presented in Table A.2 to Table A.5, Appendix 10.1. Figure 10.1 and Figure 10.2 present the dust assessment buffers.

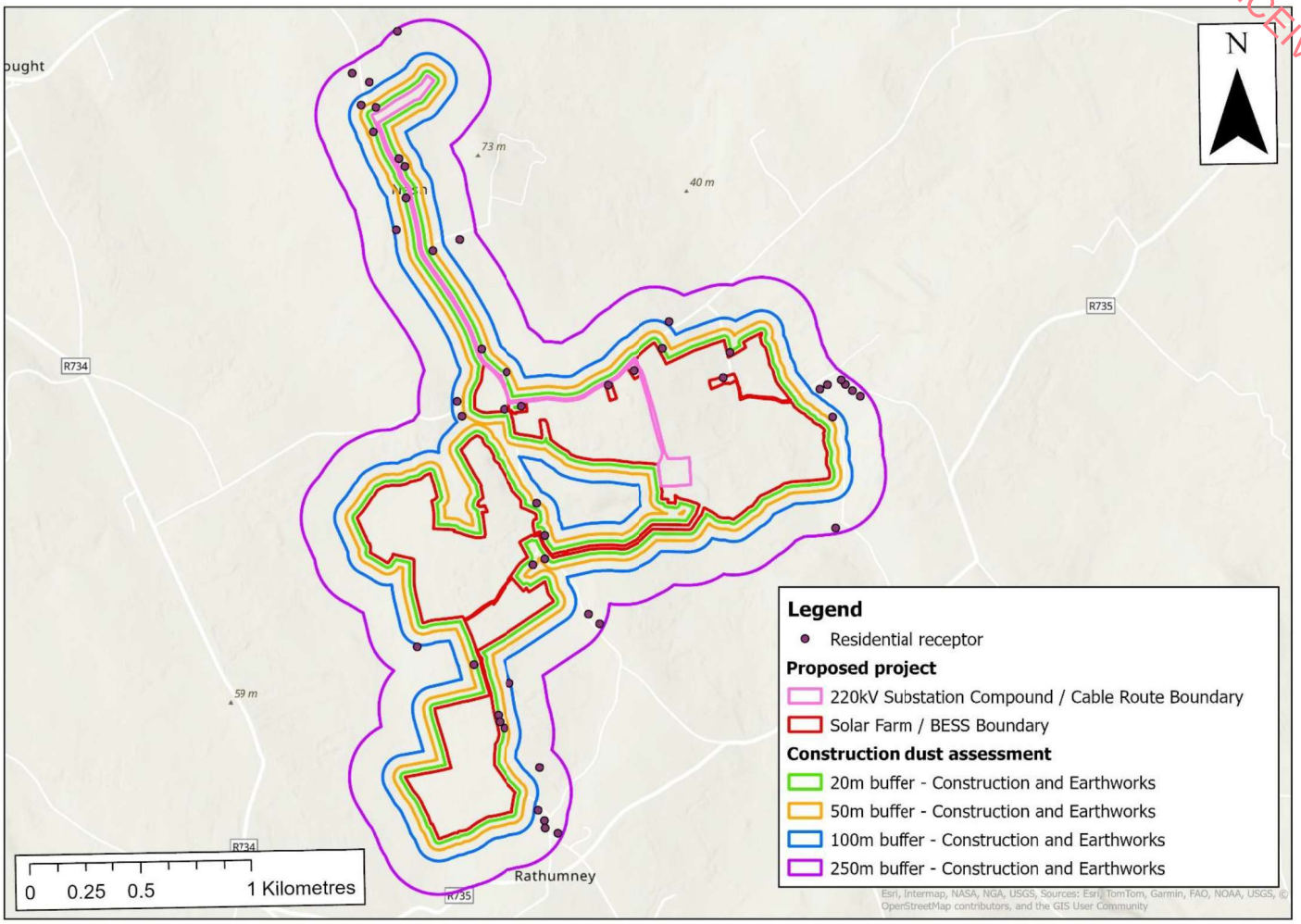
Table 10.7: Sensitivity of the Area

Activity	Dust soiling		Health effects of PM_{10}	
	Sensitivity	Comment	Sensitivity	Comment
Demolition	Not applicable	No demolition activities.	Not applicable	No demolition activities.
Earthwork	High	There are 12 high sensitivity receptors (residential properties) and several low sensitivity receptors (farmland) within 20m of the work area. These are mainly located on the site boundary or where cable routes are expected to be constructed.	Low	Background annual mean PM_{10} concentrations are <24µg/m^3 (See Table 10.5). There are 12 high sensitivity receptors (residential properties) and several low sensitivity receptors (farmland) within 20m of the work area. These are mainly located on the site boundary or where cable routes are expected to be constructed.
Construction	High		Low	

[16] Trackout route for haulage includes any internal haulage routes that leave the site boundary to enter into another section of the site. Any internal haulage routes which do not leave the site boundary have not been included.

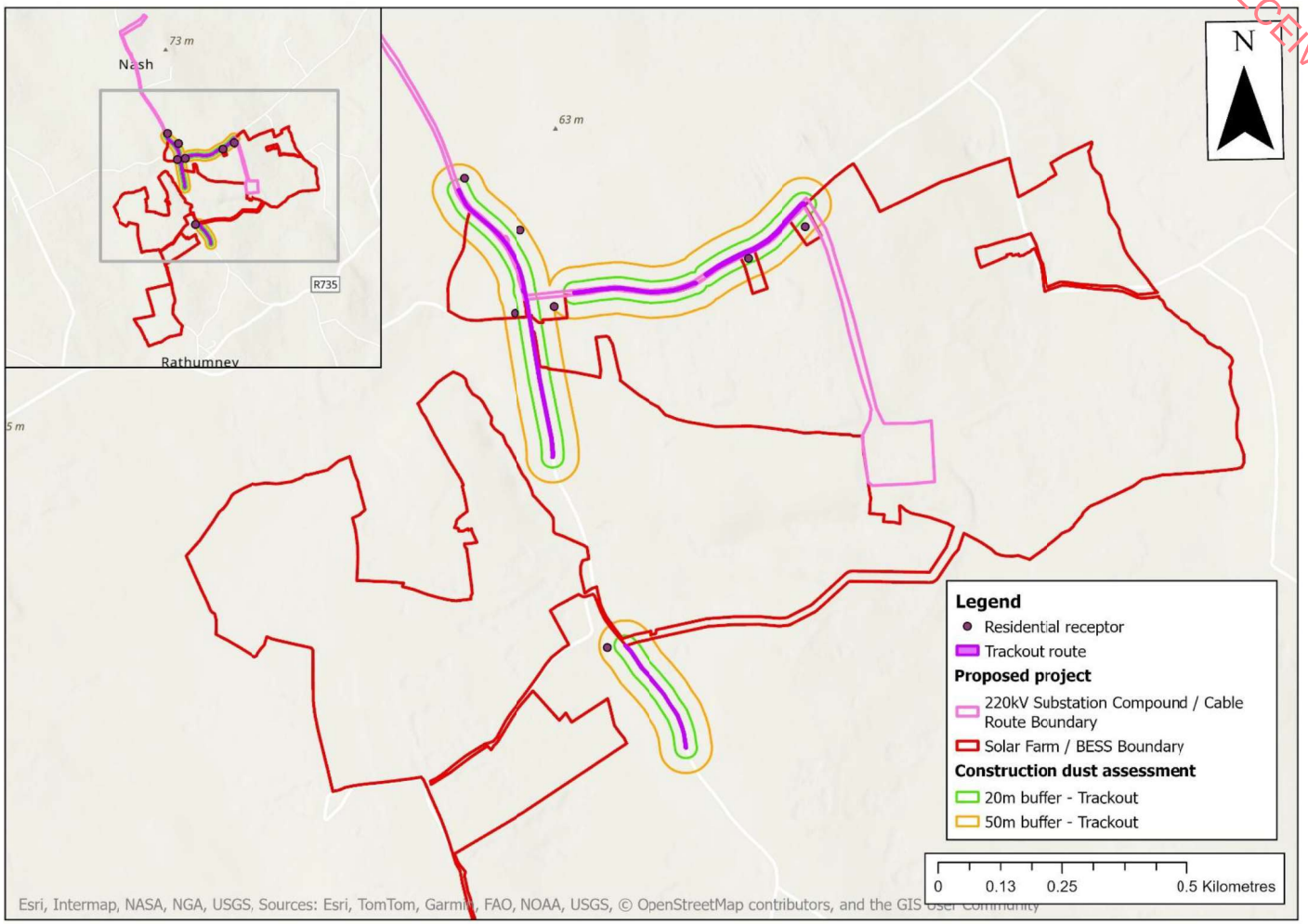
Activity	Dust soiling		Health effects of PM_{10}	
	Sensitivity	**Comment**	**Sensitivity**	**Comment**
Trackout	Medium	There is one high sensitivity receptors (residential properties) and several low sensitivity receptors (farmland) within 20m from the side of potential routes used for construction traffic (up to 250m from potential site exits).	Low	As above, background annual mean PM_{10} concentrations are <24ug/m^3 (See Table 10.5). There is one high sensitivity receptors (residential properties) and several low sensitivity receptors (farmland) within 20m from the side of potential routes used for construction traffic (up to 250m from potential site exits).

Figure 10.1: Construction Dust Assessment Buffers (Earthworks and Construction)



Source: Mott MacDonald

Figure 10.2: Construction Dust Assessment Buffers (Trackout)



Source: Mott MacDonald

The overall risks to receptors to dust effects are presented in Table 10.8 based on the criteria outlined in Table A.9 in Appendix 10.1.

Table 10.8: Summary of the risk of construction effects

Activity	Dust soiling effects	PM_{10} effects
Demolition	Not applicable	Not applicable
Earthworks	High	Low
Construction	Medium	Low
Trackout	Medium	Low

Dust soiling effects are 'Medium' to 'High' risk and PM_{10} effects are 'Low' risk without mitigation. Mitigation measures appropriate for the level of risk have been presented in Section 10.7.1. These measures are set out within the Construction Environmental Management Plan (CEMP) which forms part of this submission.

10.5.3 Operation and Maintenance Phase

As presented in Chapter 5, during operations, the Proposed Project will be monitored and operated remotely by a management team and will be visited regularly by security and/or maintenance personnel. Given the frequency of maintenance, the effects of operation road traffic contributions from the Proposed project are considered of low and not significant.

10.5.4 Decommissioning Phase

Subject to the granting of statutory approval, the Shelburne Energy Farm and grid connections will form part of the national electrical grid infrastructure. The design life of the PV Solar Farm and BESS is 30 years and 20 years respectively, where the planning permission for the operational life span of the Proposed Project overall is 40 years. No detailed information is available to complete an assessment for the decommissioning. However, the impacts stated for the construction phase should be referred to for the decommissioning phase. Therefore, the impact of the decommissioning phase on air quality would be no worse than the construction dust risk and construction traffic movements similar or less than those presented in this chapter. These effects are therefore considered to be not significant if the mitigation measures mentioned in Section 10.7 are implemented.

The Shelburne Energy Farm is to be decommissioned in line with the Decommissioning and Land Restoration Plan, contained in Appendix 3.1, Volume 3 of this EIAR.

It is expected that the 220kV Grid Connection will remain a permanent part of the national electricity transmission network and will be refurbished and / or redeveloped as required rather than be decommissioned.

10.6 Cumulative Effects

10.6.1 Other developments

Cumulative construction impacts are possible where the construction of the Proposed Project coincides with the construction phases of nearby committed developments or future developments. There are no potential cumulative projects within a 5km radius of the Proposed project. Therefore, cumulative effects with other developments in the area has not been considered any further.

If a future development should arise that is within 250m of the site boundary in line with IAQM guidance, it is recommended that regular liaison meetings are held with other high risk construction sites within 250m of the site boundary to ensure plans are co-ordinated and dust and particulate matter emissions are minimised.

10.7 Mitigation and Monitoring Measures

10.7.1 Mitigation measures

During the construction phase, construction activities associated with the Proposed Project are predicted have at worst, a 'medium' to 'high' risk for dust soiling effects and 'low' risk for human health impacts from construction activities with no mitigation in place. It is anticipated that dust and particulate matter emissions produced during construction activities and emissions from site plant would be controlled through the implementation of good practice measures which will be documented in a CEMP, which is a live document that will be regularly reviewed.

Good practice mitigation measures for the Proposed Project as outlined in IAQM guidance[7] are presented below, based on the dust risk levels presented in Table A.3 in Appendix 10.1.

10.7.1.1 Standard mitigation applicable to all area (for low to high risk)

- Communication and Site Management
  - The appointed Contractor will develop and implement a stakeholder communications plan that includes community engagement before work commences on site.
  - Display the name and contact details of person(s) accountable for air quality and dust issues on the site boundary. This will be the environment manager / engineer or the site manager.
  - Display the head or regional office contact information.
  - The Contractor will develop and implement a dust management plan (DMP) as part of the updated CEMP, which will include measures to control other emissions, approved by the Local Authority.
  - Record all dust and air quality complaints, identify causes and take appropriate measures to reduce emissions in a timely manner and record the measures taken.
  - Make a complaint log available to the planning authority, when requested.
  - Record any exceptional incidents that cause dust and or air emissions, either on or off site, and the action taken to resolve the situation in the log book.
- Monitoring
  - Undertake daily on-site and off-site inspection, where receptors (including roads) are nearby, to monitor dust, record inspection results, and make the log available to the local authority when asked. This should include regular dust soiling checks of surfaces such as street furniture, cars and window sills within 100 m of site boundary, with cleaning to be provided if necessary.
  - Carry out regular site inspections, record inspection results and make an inspection log available to the planning authority, when requested.
  - Increase the frequency of site inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.
- Preparing and maintaining the site
  - Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site.

  - Fully enclose site or specific operations where there is a high potential for dust production and the site is actives for an extensive period.
  - Avoid site runoff of water or mud.
  - Keep site fencing, barriers and scaffolding clean using wet methods.
  - Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site. If they are being re-used on-site cover as stated below.
  - Cover, seed or fence stockpiles to prevent wind whipping.
- Operations vehicles / machinery and sustainable travel:
  - Ensure all vehicles switch off engines when stationary – no idling vehicles.
  - Avoid the use of diesel- or petrol-powered generators and use mains electricity or battery powered equipment, where practicable.
  - Impose and signpost a maximum-speed-limit of 15 mph on surfaced and 10 mph on unsurfaced haul roads and work areas (if long haul routes are required these speeds may be increased with suitable additional control measures provided, subject to the approval of the nominated undertaker and with the agreement of the local authority, where appropriate).
  - Produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials.
- Operations
  - Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction.
  - Ensure an adequate water supply on the site for effective dust/ particulate matter suppression/ mitigation using non-potable water, where possible and appropriate.
- Waste management
  - Avoid bonfires and burning of waste materials.
- Mitigation specific to earthworks
  - Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable.
  - Use Hessian, mulches or tackifiers where it is not possible to re-vegetate or cover with topsoil, as soon as practicable.
  - Only remove the cover in small areas during work and not all at once.
- Mitigation specific to construction:
  - Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place.
- Mitigation specific to trackout:
  - Use water-assisted dust sweeper(s) on the access and local roads, to remove, as necessary, any material tracked out of the site.
  - Avoid dry sweeping of large areas.
  - Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport.
  - Inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable.
  - Record all inspections of haul routes and any subsequent action in a site log book.
  - Install hard surfaced haul routes, which are regularly damped down with fixed or mobile sprinkler systems, or mobile water bowsers and regularly cleaned.

- Access gates to be located at least 10 m from receptors where possible.

10.7.2 Monitoring measures

At all times, these mitigation measures will be strictly monitored and assessed by the Site Manager. Site inspections will be carried out and an inspection log will be made available to the local authority when requested.

10.8 Residual Impacts

With the successful incorporation of best practice mitigation as detailed in the CEMP which accompanies the application, the residual impacts on dust emissions from construction activities will be negligible.

There are therefore no significant impacts predicted during the construction and operational phases for air quality with the successful incorporation of best practice mitigation.

10.9 References

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