Onshore Converter Station

Code of Construction Practice
Appendix 4 Air Quality Monitoring Plan
DCO Requirement 22 (2) (e)

(Applicable to Work Numbers 62 to 69)

Prepared by:	Checked by:	Approved by:
B Turner, SLR	Philip Rew-Williamson Digitally signed by: Philip Rew-Williamson DN: CN = Philip Rew-Williamson email = prew-williamson@scottishpower.com C = GB O = East Anglia THREE OU = Consents Date: 2022.04.07 12:23:34 Z	Gareth Mills Digitally signed by Gareth Mills Date: 2022.04.07 16:09:11 +01'00'

Revision Summary				
Rev	**Date**	**Prepared by**	**Checked by**	**Approved by**
1	15/04/2021	Kay Griffin	Phil Rew-Williamson	David Boyd
2	21/12/21	Ben Turner	Phil Rew-Williamson	Gareth Mills
3	31/03/22	Ben Turner	Phil Rew-Williamson	Gareth Mills

Description of Revisions			
Rev	**Page**	**Section**	**Description**
1	ALL	ALL	New Document
2	ALL	ALL	Amended in accordance with consultee comments on Interim Draft and also to include detailed air quality assessment
3	ALL	ALL	Amended in accordance with consultee comments on Final Draft (MSDC, 26/01/22)

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1. INTRODUCTION AND SCOPE

1.1. Project Overview

1. East Anglia Three Limited (EATL) was awarded a Development Consent Order (DCO) by the Secretary of State, Department of Business, Energy and Industrial Strategy (DBEIS) on 7 August 2017 for the East Anglia THREE Offshore Windfarm (EA THREE). The DCO granted consent for the development of a 1,200MW offshore windfarm and associated infrastructure and is live until 28 August 2022. The DCO has now been subject to three non-material variations:

- In March 2019 EATL submitted a non-material change application to DBEIS to amend the consent to increase the maximum generating capacity from 1,200MW to 1,400MW and to limit the maximum number of gravity base foundations to 100. In June 2019 DBEIS authorised the proposed change application and issued an Amendments Order.
- In July 2020 EATL submitted a second non-material change application to DBEIS to amend the parameters of its offshore substations (reducing the number of these to one) and wind turbines (a decrease in the number of turbines and an increase in their hub height and rotor radius). On 15 April 2021 DBEIS authorised this proposed change application and issued an Amendments Order.
- In August 2021 EATL submitted a third non-material change application to DBEIS to amend the consent to remove the maximum generating capacity of 1,400MW and to amend the parameters of its wind turbines (a decrease in the number of turbines and an increase in their hub height and rotor radius). The application is currently in the consultation phase.

2. The onshore construction works associated with EA THREE will have a capacity of 1400MW and transmission connection of 1320MW. The construction works will be spread across a 37km corridor between the Suffolk coast at Bawdsey and the converter station at Bramford, passing the northern side of Ipswich. As a result of the strategic approach taken, the cables will be pulled through pre-installed ducts laid during the onshore works for East Anglia ONE Offshore Windfarm (EA ONE), thereby substantially reducing the impacts of connecting to the National Grid (NG) at the same location. The infrastructure to be installed for EA THREE, therefore, comprises:

- The landfall site with one associated transition bay location with two transition bays containing the connection between the offshore and onshore cables;
- Two onshore electrical cables (single core);
- Up to 62 jointing bay locations each with up to two jointing bays;
- One onshore converter station, adjacent to the EA ONE Substation;
- Three cables to link the converter station to the National Grid Bramford Substation;
- Up to three onshore fibre optic cables; and
- Landscaping and tree planting around the onshore converter station location.

3. Since the granting of the DCO, the decision has been made that the electrical connection for EA THREE will comprise a high voltage direct current (HVDC) cable rather than a high voltage alternating current cable and, therefore, the type of substation that will be required is a HVDC converter station. The substation will, therefore, be referred to here as a 'converter station' and this amended terminology has been agreed with the relevant authorities on 15 October 2020. It has also been determined that only one converter station will be constructed rather than two and that the converter station will be installed in a single construction phase.

1.2. Scope

4. This Employer's Air Quality Monitoring Plan (AQMP) sets out the monitoring and mitigation measures to be applied to the construction of EA THREE converter station (Converter Station), to ensure that any potential unmitigated effects are minimised, and where possible, removed. This AQMP is submitted as an appendix to the Code of Construction Practice (CoCP) and fulfils DCO Requirement 22 (2) (e) which states:

> *22.—(2) The code of construction practice must include (...)*
>
> *(e) an air quality monitoring plan*

5. The scope of this document relates to the construction of the Converter Station. This stage comprises Work No.s 62 to 69 in the DCO, located to the north of the existing NG substation and adjacent to the EA ONE Substation (Figure 1 Site Context Plan). AQMPs have been produced for each stage of the onshore works and are provided under separate cover. The Principal Contractor will develop their own detailed AQMP in accordance with this Employer's AQMP.

6. Construction works at the Converter Station will be some of the first onshore connection works to commence. The access track and temporary laydown will be constructed in Summer 2022 with the remaining works being undertaken from Q2 2023.

7. The purpose of this AQMP is to set out the implementation of the appropriate control measures and mitigation to minimise the adverse environmental effects during the construction of the Converter Station. The AQMP also provides the framework of the monitoring plan to evaluate the efficiency of applied control measures and mitigation. It covers all phases of the construction process and takes into account the work of the Principal Contractors and subcontractors.

8. The following objectives have been identified in terms of air quality management for the Converter Station:

- Release of dust/particulate matter must not cause an environmental nuisance at any human or ecological receptor;
- No justified complaints received regarding excessive dust generation or air pollution, as a result of construction activities;
- Ensure exhaust emissions of the plant and equipment used in construction activities are controlled;
- Monitor and maintain dust controls throughout the construction of the onshore elements;
- Monitor the effects of all activities on air quality and the effectiveness of mitigation measures;
- Limit the disturbed area and reinstate as soon as practicable, following the completion of works;
- Ensure all personnel are appropriately trained in environmental awareness; and
- No environmental fines or prosecutions relating to dust and air quality.

9. Potential dust impacts during the construction of the Converter Station are considered to be temporary in nature and short-term. The impacts are determined to be temporary as they will only potentially occur throughout the construction phase (approximately 2 years) and short-term because these will only arise at particular times when certain activities and meteorological conditions coincide.

10. Any risks associated with potential contaminated land are addressed in Section 11 of the Code of Construction Practice (of which this is an appendix), and as such are not covered within this plan.

11. The information contained herein shall be adhered to by the appointed Principal Contractors and subcontractors and implementation and compliance will be monitored by the Construction Management Team. These measures will only be revised with the agreement of Mid Suffolk District Council (MSDC).

2. ABBREVIATIONS

AQAL	Air Quality Assessment Level
AQMA	Air Quality Management Area
AQMP	Air Quality Monitoring Plan
AQS	Air Quality Strategy 2007
CLO	Community Liaison Officer
Defra	Department for Environment, Food and Rural Affairs
DPF	Diesel Particulate Filters
EnvCoW	Environmental Clerk of Works
EPA	Environmental Protection Act 1990
EPUK	Environmental Protection UK
ES	Environmental Statement
HGV	Heavy Goods Vehicle
IAQM	Institute of Air Quality Management
IBR	Scottish Power / Iberdrola Renewables Offshore
LAQM	Local Air Quality Management
MSDC	Mid Suffolk District Council
NRMM	Non-Road Mobile Machinery

NO_2	Nitrogen Dioxide
$PM_{2.5}$	Particulate matter with an aerodynamic diameter less than or equal to 2.5 micrometres
PM_{10}	Particulate matter with an aerodynamic diameter less than or equal to 10 micrometres

3. LEGISLATION, GUIDELINES, BEST PRACTICES AND STANDARDS

3.1. Legislation

12. This section includes the relevant legislation in place that is used to control dust and emissions, in this case from the onshore construction activities.

- Clean Air Strategy 2019;
- Clean Air Act 1993;
- Environmental Protection Act (EPA) 1990;
- Environment Act 1995, Section 82; and
- UK Air Quality Strategy (AQS) 2007.

3.1.1. Air Quality Strategy

13. The ambient air quality standards of relevance to human receptors (as prescribed within the AQS) are set out in Table 3-1 below.

Table 3-1 Relevant Air Quality Objectives (AQOs)

Pollutant	Standard (µg/m^3)	Measured As
Nitrogen Dioxide (NO_2)	40	Annual mean
	200	1-hour mean (not to be exceeded on more than 18 occasions per annum)
Particles (PM_{10})	40	Annual mean
	50	24-hour mean (not to be exceeded on more than 35 occasions per annum)
Particles ($PM_{2.5}$)	25	Annual mean

3.1.2. Local Air Quality Management

14. As reinforced within the AQS, Part IV of the Environment Act 1995 introduces a statutory duty for local authorities to undergo a process of Local Air Quality Management (LAQM). This requires local authorities to Review and Assess air quality to determine the likeliness of compliance, regularly and systematically.

15. Where any of the prescribed AQS objectives are not likely to be achieved, the authority must designate an Air Quality Management Area (AQMA). For each AQMA, the local authority is required to prepare an Air Quality Action Plan, which details measures the authority intends to introduce to deliver improvements in local air quality in pursuit of the relevant objective.

3.1.3. Environmental Protection Act 1990

16. Part III of the EPA 1990 (as amended) contains the main legislation on statutory nuisance and allows local authorities and individuals to take action to prevent a statutory nuisance. Section 79 of the EPA defines, amongst other things, smoke, fumes, dust and smells emitted from industrial, trade or business premises so as to be prejudicial to health or a nuisance, as a potential statutory nuisance.

3.2. Guidelines, Standards and Best Practices

17. Several guides, standards and best practice documents are considered in the development of this plan. These documents are designed to offer guidance in reducing impacts of air pollution, based on expert evaluation of current scientific evidence. These documents are not legally binding, they are however often referred to as references for defining and measuring air quality.

- Defra: Local Air Quality Management Technical Guidance 2016 (LAQM.TG16) (2021);
- Environment Agency: Monitoring Particulate Matter in Ambient Air around Waste Facilities (2013);
- Environmental Protection United Kingdom (EPUK) and Institute of Air Quality Management (IAQM) Land-Use Planning & Development Control: Planning for Air Quality (2017);
- IAQM: Guidance on the Assessment of Dust from Demolition and Construction, v1.1 (2016); and

- IAQM: Guidance on Monitoring in the Vicinity of Demolition and Construction Sites, v1.1 (2018).

3.2.1. Guideline Limits to Prevent Dust Nuisance

18. Fractions of dust greater than 10µm (i.e. greater than PM_{10}) in diameter typically relate to nuisance effects as opposed to potential health effects and therefore are not covered within the UK AQS.

19. There are no statutory limit values for dust deposition above which 'nuisance' is deemed to exist, as it is a subjective concept. However, a deposition rate of 200mg/m^2/day is generally adopted for the onset of complaints, as proposed by the IAQM and the Environment Agency – relating to monitoring methods that are acknowledged as coming into use through 'custom and practice'.

4. BASELINE CONDITIONS

4.1. Review of Local Air Quality Monitoring

20. The nearest AQMA relative to the site is located greater than 5km away, within Ipswich. As such, air quality within the immediacy of the Converter Station is not considered to be sensitive with respect to human health.

21. Monitoring data collected prior to the COVID-19 pandemic (i.e. pre-2020) has been used to characterise the baseline environment, as pollutant concentrations monitored during 2020 and 2021 are expected to be atypical, and not representative of the local environment and have therefore not been considered.

22. MSDC and Babergh District Council (BDC) did not undertake any automatic monitoring of pollutants in their administrative area. The nearest automatic monitor was located approximately >5km southeast of the Converter Station, within Ipswich along the A1214 Yarmouth Road – titled IPS3. This monitor is operated by Ipswich Borough Council. In addition, MSDC and BDC undertook passive NO_2 diffusion tube monitoring within their administrative area. The nearest passive diffusion tubes in 2019 were located >2.5km south east of the site along the B1113 – Loraine Way. Given the separation distance and anticipated differences in local environments, monitoring from automatic and non-automatic locations have not been considered further.

4.2. Defra Mapped Background Concentrations

23. Defra maintains a nationwide model of existing and future background air quality concentrations at a 1km grid square resolution which is routinely used to support LAQM requirements and air quality assessments. The data sets include annual average concentration estimates for NO_2, PM_{10} and $PM_{2.5}$ using a base year of 2018 (the year in which comparisons between modelled and monitoring are made).

24. The 2022 Defra mapped annual mean background concentrations for the grid squares covering the Convertor Station (representing the earliest anticipated year of construction) are presented in Table 4-1. All the mapped background concentrations presented are well below the respective annual mean air quality assessment levels (AQAL)s.

Table 4-1 Defra Background Pollutant Concentrations

Grid Square (X, Y)	Year	Annual Mean Background Concentration (µg/m^3)		
		NO_2	PM_{10}	$PM_{2.5}$
609500, 246500	2022	7.0	15.5	9.0
AQAL		**40**	**40**	**25**

5. CONSTRUCTION DETAILS

5.1. Enabling Works

25. The onshore construction works will commence with the enabling works, which comprises the establishment of the temporary laydown area (Work No 65) and the access to this from the existing EA ONE access road. The temporary laydown area will be directly northeast of the converter station and will include temporary offices, welfare, car parking, materials and equipment storage. At the start of the works the onshore converter station compound and temporary laydown area will be temporarily fenced in accordance with the Fencing and Enclosures Plan (EA3-GRD-CON-PLN-IBR-000106) and a security cabin will be installed at the main access gate.

26. Following any necessary ecological mitigation, topsoil will be stripped from the access road and temporary laydown area and stored at specific storage locations as to avoid cross contamination with other materials. Topsoil storage and management will be compliant with the recommendations and requirements set out in the Onshore Converter Station Landscape Management Plan (EA3- EA3-GRD-CON-PLN-IBR-000103). Topsoil will be stored to one side of the working area, in such a way that it is not mixed with any subsoil. Typically this would be stored as an earth bund of a maximum height of two metres, to avoid compaction from the weight of the soil. Storage time will be kept to a minimum, to prevent the soil deteriorating in quality and the topsoil bunds seeded to prevent windblow. Topsoil stripped from different fields will be stored separately, as would soil from specific hedgerow banks or woodland strips.

27. The construction of an access road typically involves the placement of suitable graded imported stone material onto a suitable subgrade, potentially with a reinforcing geogrid and/or a geotextile, however other methods such as soil stabilisation may be used if considered appropriate. Following the initial topsoil stripping, the on-site access road will be installed for a width of 6m.

28. The enabling works will also include installation of surface water drainage for the access road and temporary laydown area, in accordance with the Surface Water and Drainage Management Plan (EA3-GRD-CON-PLN-IBR-000107). Foul water drainage during this initial period will be via portable welfare facilities, with a tank that will be emptied on a weekly or bi-weekly basis.

5.2. Construction

29. The EA THREE onshore converter station will be located within a fenced compound (maximum 157m by 186m) (Work No. 67), immediately to the east of the East Anglia ONE Substation and to the north of the existing NG Bramford Substation. The converter station will contain electrical equipment including power transformers, switchgear, reactive compensation equipment, harmonic filters, cables, lightning protection masts, control buildings, communications masts, backup generators, access, fencing and other associated equipment, structures or buildings. The converter station will have a compact layout, with the majority of the equipment contained in buildings not incongruous to their setting.

30. The construction of the converter station will comprise a number of key stages, including: platform upfill to finished level (approx. 54m AOD) foundations and building construction and equipment installation and commissioning.

31. The main site access has already been constructed as part of the EA ONE works, however, an internal service road from this will require installation.

32. The enabling works will include grading and earthworks to remove any unsuitable materials from the converter station area and to build up with suitable fill material to establish a formation level for the converter station construction. The materials excavated will be reused on site as engineering fill or landscaping depending on material properties.

33. Following the completion of the site grading, works will commence with the excavations for ducting and the foundations for the buildings and external plant. The building will largely comprise steel, concrete or masonry and cladding materials. The structural steelwork will be fabricated and prepared off site and delivered to site for erection activities using cranes. The composite or cassette cladding panels (e.g. Kingspan) will be delivered to site ready to erect and be fixed to the steelwork.

34. The civil works will be followed by the installation and commissioning of the electrical equipment. The large transformers will be filled on site. The smaller electrical components will be constructed on site using small mobile plant and lifting apparatus.

5.3. Cable Installation

35. Works No.s 63 and 66 will comprise the installation in open trenches of cables to connect the Converter Station to the nearby National Grid Bramford Substation. Construction activities for the installation of the cable in open trenches will be undertaken within a temporarily fenced strip of land, referred to as the working width.

36. The cable route into the Converter Station from Work No. 64 through Work No 63 was not known at the time of the preparation of the Environmental Statement and it was considered at that time that this may also be installed using open trenches. The ducts have now, however, been installed during the construction works for EA ONE to end within Work No. 67 (the converter station site). There will, therefore, be no requirement, as originally anticipated, to open trench these through Work no. 63 to the Converter Station.

37. Works in Work No. 62 will also include the installation of haul road to reach a jointing bay in the adjacent Work No. 58 (not part of this stage) to the east. This will follow the route of the EA ONE haul road as shown in Figure 2.

38. In addition, all ducts to be used for EA THREE, which were installed during the EA ONE construction works, will require to be 'proved' to ensure that they are intact and free of debris. This will generally be undertaken by the use of foam pigs driven under pressure from jointing bay to jointing bay. Each stretch of duct that was installed using HDD will, however, require duct-proving excavations at each end to allow the use of different diameter foam pigs, due to a difference in the diameter of these compared to the ducting installed using open trench techniques.

5.4. Schedule and Working Hours

39. The construction of the converter station is proposed to start in July 2022 and expected to take approximately 2 years to complete.

40. DCO Requirement 25 defines the construction working hours as follows:

> ***25.***—*(1) Construction work for the connection works must only take place between 0700 hours and 1900 hours Monday to Saturday, with no activity on Sundays or bank holidays, except as specified in paragraph (2).*
>
> *(2) Outside the hours specified in paragraph (1), construction work may be undertaken for essential and non-intrusive activities including but not limited to:*
>
> *(a) continuous periods of operation that are required as assessed in the environmental statement, such as concrete pouring;*
>
> *(b) fitting out works associated with the onshore substation(s) comprised within Work No. 67;*
>
> *(c) delivery to the connection works of abnormal loads that may cause congestion on the local road network;*
>
> *(d) connection works carried out on the foreshore;*
>
> *(e) daily start up or shut down;*
>
> *(f) electrical installation; and*
>
> *(g) non-destructive testing.*
>
> *(3) All construction work undertaken in accordance with paragraph (2)(a) to (d) must be agreed with the relevant planning authority in writing in advance, and must be carried out within the agreed time*.

41. Further information is provided in Section 5.5 of the CoCP.

5.5. Construction Road Traffic

42. Construction phase road traffic will access the Converter Station via the A14, B1113 (Loraine Way) and Bullen Lane. No construction Heavy Goods Vehicles (HGVs) are to be routed through Coddenham and Sproughton. Further detail is provided in the Onshore Converter Station Traffic Management Plan (Doc. ID: EA3-GRD-CON-PLN-IBR-000105).

43. An assessment of the potential impacts associated with construction road traffic was undertaken as part of the previously submitted 2015 ES. This considered road traffic volumes generated by all onshore construction activities. In accordance with the EPUK and IAQM guidance, effects upon NO_2, PM_{10} and $PM_{2.5}$ concentrations at existing receptors were considered to be 'not significant'. No further consideration was therefore needed.

44. Following further design works by the selected converter station contractor, maximum vehicle movements generated along the access route have been updated (Table 5-1). Daily peak and average HGV movements have been calculated across the lifespan of construction works for the Converter Station. Both sets of values are below the relevant screening thresholds prescribed within the EPUK and IAQM guidance document for requiring further assessment (e.g. 100 HGV annual average daily traffic (AADT) flows). Use of peak values for screening purposes is considered to be conservative, as these values are not averaged nor annualised over a full year – as such are likely to be higher in comparison to daily averages (as illustrated in Table 5-1). In addition, it is noted that during the peak period of HGV movements with respect to the converter station (ie concrete pouring) there will be no HGV movements along Bullen Lane associated with the cable works.

Table 5-1 **Expected Peak HGV movements along Bullen Lane**

	HGV movements (two-way)				
	Daily peak	Hourly peak	Peak duration (weeks)	Daily ave.	Expected duration (weeks)
Converter Station	68	26	2	4	135

5.6. Non-Road Mobile Machinery

45. To facilitate construction, non-road mobile machinery (NRMM) will be used. NRMM refers to mobile machines, transportable industrial equipment or vehicles which are fitted with an internal combustion engine and not intended for transporting goods or passengers on roads. An inventory of NRMM proposed to be used for the construction of the Conversation Station is presented in Table 5-2.

46. Following application of suitable controls (such as those outlined in Section 8) emissions from NRMM used during the construction phase are unlikely to make a significant impact on local air quality – as per LAQM.TG(16).

Table 5-2 Details of NRMM

NRMM Construction Equipment
30T Excavator
Dozer
9T Dumper
Backactor Excavator
Road Roller
Telehandler
Mobile Crane
Static Crane
3T Dumper
Scissor Lift
Concrete Pump
Hydraulic Hammer Piling

6. CONSTRUCTION DUST ASSESSMENT METHODOLOGY

47. A construction dust assessment was undertaken as part of the wider ES, using guidance documents and associated methodologies that are still considered relevant and up to date. A separate dust assessment has now been undertaken on behalf of EATL (in accordance with IAQM guidance) which focuses solely on construction activities proposed at the Converter Station, with the use of updated information from the contractors. In addition, a number of mitigation measures (including those set out in the Outline Code of Construction Practice) have been included within this AQMP to provide a best practice approach.

48. The assessment of risk is determined by considering the risk of dust effects arising from four activities in the absence of mitigation. The assessment will consider the potential dust impacts associated with the following activities:

- Demolition
- Earthworks;
- Construction; and
- Track-out.

49. The assessment methodology considers three separate dust impacts with account being taken of the sensitivity of the area that may experience these effects:

- Annoyance due to dust soiling;
- The risk of health effects due to an increase in exposure to PM_{10}; and
- Harm to ecological receptors.

50. The first stage of the assessment involves a screening exercise to determine if there are sensitive receptors within threshold distances of the site activities associated with the construction phase of the scheme. Further assessment is required where a:

- Human receptor is located within 350m of the Site, and/or within 50m of routes used by construction vehicles, up to 500m from the site entrance(s); and/or
- Ecological receptor is located within 50m of the Site, and/or within 50m of routes used by construction vehicles, up to 500m from the site entrance(s).

51. The dust emission class (or magnitude) for each activity is determined based on the guidance, indicative thresholds and expert judgement. The risk of dust effects arising is based upon the relationship between the dust emission magnitude and the sensitivity of the area. The risk of impact is then used to determine the appropriate mitigation requirements, whereby through effective application, residual effects are considered to be 'not significant'.

52. The IAQM guidance therefore does not provide a framework to determine the significance of unmitigated effects, as is not considered appropriate nor relevant in this context. For these reasons, the significance of unmitigated effect of construction dust cannot be defined.

7. CONSTRUCTION PHASE DUST ASSESSMENT

7.1. Assessment Screening

53. There are human receptors within 350m of the site (farmhouse at Tye Lane, 330m to the north) but no ecologically designated sites within 50m of the site boundary or within 50m of roads that will witness construction traffic movements up to 500m from the site entrance(s). The nearest designated habitat site is Millers Wood Ancient Woodland located approximately 80m east of the site boundary along Bullen Lane. Therefore, an assessment of construction dust on human receptors only is required.

7.2. Potential Dust Emissions Magnitude

54. A summary of the dust emission magnitude for the four assessed activities is provided below and summarised in Table 7-1. This assessment has used information provided by the appointed construction contractors.

7.2.1. Demolition

55. There are no existing buildings or structures currently occupying the site which are to be demolished. As such, an assessment of the potential dust impacts associated with this activity has been screened out from requiring assessment.

7.2.2. Earthworks

56. Site earthworks are required over an area greater than 10,000m^2 with potentially dusty soil types (loamey and clayey[1]). It is expected that there will be a maximum of 5-10 heavy earth moving vehicles active at any one time moving up to 70,000 tonnes of material. Bunds of material are to be formed for top and subsoil up to 2m and 3m in height respectively and for landscaping up to 7m in height. As such, the dust emissions magnitude for earthworks is therefore initially considered to be 'large'.

7.2.3. Construction

57. The proposals comprise the construction of a converter station and associated facilities, as discussed in Section 5. The aggregated building volume is approximately 77,530m^3 of construction material with low potential for dust release (metal cladding). As such, the potential dust emission magnitude for construction is therefore initially considered to be 'small'.

7.2.4. Trackout

58. Construction vehicles are expected to access the site via Bullen Lane to the south along a paved access road. The maximum number of outward HGV movements in any one day is expected to be 34. There are expected to be unpaved roads >100m. As such, the potential dust emission magnitude for trackout is therefore initially considered to be 'medium'.

Table 7-1 Potential dust emission magnitude

[1] Soilscapes (2021) http://www.landis.org.uk/soilscapes/

Activity	Dust Emission Magnitude
Earthworks	Large
Construction	Small
Trackout	Medium

7.3. Sensitivity of the Area

59. A summary of the sensitivity of the surrounding area is detailed in the following text and summarised in Table 7-2.

7.3.1. Dust Soiling

60. There are 1-10 existing residential properties (highly sensitive receptors) within 350m of the site boundary. There are no receptors within 50m of the public highway up to 200m from the site exit along Bullen Lane (commensurate of a medium trackout magnitude).

61. The sensitivity of the area with respect to dust soiling effects on people and property in relation to earthworks, construction and trackout is therefore considered to be 'low'.

7.3.2. Human Health

62. The maximum 2022 Defra mapped background PM_{10} concentration (2018 base year) for the 1km^2 grid square centred on the site is estimated to be 15.5µg/m^3 (i.e. falls into the <24µg/m^3 class). As discussed in Section 4.1, no local background PM_{10} monitoring exists within the development locale.

63. Given the above information regarding the number of residential receptors within 350m of the site and access roads within 50m from the site entrance, the sensitivity of the area with respect to human health impacts in relation to demolition, earthworks, construction and trackout is therefore considered to be 'low'.

Table 7-2 Sensitivity of the Area

Potential Impact	Earthworks	Construction	Trackout
Dust Soiling	Low	Low	Low
Human Health	Low	Low	Low

7.4. Risk of Impacts (Unmitigated)

64. The calculated sensitivities and dust emission magnitudes for each activity and impact are combined to determine the risk of impact (unmitigated) which is used to inform the selection of appropriate mitigation for inclusion within the AQMP, and implementation throughout the construction phase.

Table 7-3 Risk of dust impacts (unmitigated)

Potential Impact	Earthworks	Construction	Trackout
Dust Soiling	Low Risk	Negligible	Low Risk
Human Health	Low Risk	Negligible	Low Risk

65. Following the construction dust assessment, the site is found to be at worst 'Low Risk' in relation to dust soiling effects on people and property and human health impacts. In addition, potential dust effects during the construction phase are considered to be temporary in nature and may only arise at particular times (i.e. certain activities and/or meteorological conditions).

66. Nonetheless, commensurate with the above designation of dust risk, mitigation measures, as identified in the IAQM guidance, are required to ensure that any potential impacts arising from the construction phase of the proposed development are reduced and, where possible, completely removed.

8. CONTROL MEASURES AND MITIGATION

67. The air quality control measures set out below will be included in the relevant Risk Assessment and Method Statement that will be submitted for each construction activity by all appointed contractors. The mitigation measures are proportionate to the scale and extent of impacts predicted and are included in the various standards and best practice guidelines.

68. The air quality control measures presented in Table 8-1 comprise the Highly Recommended and Desirable measures identified as a result of the Construction Phase Dust Assessment set out in Section 7 and also a number of further best practice measures which were included, *inter alia*, within the AQMP for EA ONE.

69. During the construction phase, a proactive approach will be taken to ensuring the potential for fugitive dust emissions is minimised, rather than pursuing a reactionary approach i.e. when a complaint is made. This will be achieved through the implementation of a monitoring strategy as detailed in Section 9. This strategy will comprise routine visual inspections by onsite contractors and application of the 'as needed' or 'as necessary' controls identified in Table 8-1, i.e. if the levels of dust deposition are seen to increase significantly during the visual inspections, further dust controls will be implemented as appropriate from the list of measures presented in Table 8-1. This process is illustrated in Appendix A.

Table 8-1 Air Quality Control Measures

Mitigation Measure - Category	Description	Timing	Responsibility
Site Planning	If any high-risk construction sites are identified within 500m of the site boundary, liaison will be undertaken to ensure plans are co-ordinated and dust and particulate matter emissions are minimised, including with respect to interactions of the off-site transport/deliveries which might be using the same strategic road network routes.	One off	Principal Contractor
	Implementation of energy conservation measures including instructions to throttle down or switch off idle construction equipment; switch off the engines of trucks while they are waiting to access the site and while they are being loaded or unloaded, ensure equipment is properly maintained to ensure efficient energy consumption	Ongoing	Principal Contractor
Sustainable Travel and Machinery	Ensure all vehicles switch off engines when stationary - no idling vehicles.	Ongoing	All personnel
	Avoid the use of diesel- or petrol-powered generators and use mains electricity or battery powered equipment where practicable.	Ongoing	Principal Contractor
	Impose and signpost a maximum-speed-limit of 15mph on surfaced and 10mph on unsurfaced haul roads and work areas.	Ongoing	Site Manager/Principal Contractor
Operations	Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems.	As needed	Principal Contractor
	Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate.	As needed	Principal Contractor
	Use enclosed chutes and conveyors and covered skips (other than where materials are not dust-generating and the covering of the skips introduces risks for loading and unloading).	Ongoing	Principal Contractor
	Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate.	Ongoing	All personnel
	Monitor weather forecasts for prolonged dry or windy conditions and modify (or delay) potentially dusty site activities until the risk has reduced.	Ongoing	Principal Contractor/Site Manager

Mitigation Measure - Category	Description	Timing	Responsibility
	Ensure equipment is readily available on site to clean any dry spillages and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods.	Ongoing	Principal Contractor
Preparing and Maintaining the Site	Plan the site layout so that machinery and dust causing activities are located as far from receptors as possible, unless required for works.	As needed	Principal Contractor
	Erect effective solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site.	As needed	Principal Contractor
	Enclose site or specific operations where there is a high potential for dust production and the site is active for an extensive period.	As needed	Principal Contractor/all personnel
	Keep site fencing, barriers and scaffolding clean using wet methods eg fine water spray.	Ongoing	Principal Contractor
	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 described below.	As needed	Principal Contractor/all personnel
	Cover, seed or fence stockpiles to prevent wind whipping.	Ongoing	Site Manager/Principal Contractor
Site Management	Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken.	Ongoing	Principal Contractor/Site Manager
	Make the complaints log available to the local authority when asked.	As needed	Community Liaison Officer
	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 logbook.	As needed	Principal Contractor/Site Manager
Waste Management	Bonfires and burning of waste will not be allowed on site	Ongoing	Principal Contractor/all personnel
Construction Traffic	Runoff of mud and water will be prevented.	As needed	Principal Contractor
	Regularly dampen down haul routes with fixed or mobile sprinkler systems, where necessary.	Ongoing	Principal Contractor
	Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the site exit, wherever site size and layout permits. Locate site access gates at least 10m from receptors where practicable.	As needed	Principal Contractor
	Vehicles leaving site will be washed if necessary.	Ongoing	Principal Contractor
	Inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable.	Ongoing	Principal Contractor/Site Manager
	Monitoring of haul road surface condition.	Ongoing	Principal Contractor
Trackout	Implement a wheel washing system to dislodge accumulated dust and mud prior to leaving the site.	As needed	Principal Contractor
	Use water-assisted dust sweeper(s) on the EA ONE existing access road and Bullen Lane, to remove, as	As needed	Principal Contractor

Mitigation Measure - Category	Description	Timing	Responsibility
	necessary, any material tracked out of the site. This may require the sweeper being continuously in use.		
	Avoid dry sweeping of large areas.	As needed	Principal Contractor
	Ensure all vehicles entering and the leaving the site which are carrying loads are covered to prevent escape of materials during transport.	Ongoing	Site Manager/Principal Contractor
	Record all inspections of haul routes and any subsequent action in a site logbook.	Ongoing	Principal Contractor/all personnel
NRMM	All NRMM should be well maintained. If any emissions of dark smoke occur, then the relevant machinery should stop immediately, and any problem rectified	Ongoing	Principal Contractor
	All NRMM will use ultralow sulphur diesel (fuel meeting the specification within EN590:2004) where available.	Ongoing	Principal Contractor
	All NRMM to comply with either the current or previous EU Directive Staged Emission Standards	Ongoing	Principal Contractor
	All NRMM will be fitted with Diesel Particulate Filters (DPF) conforming to defined and demonstrated filtration efficiency (load/duty cycle permitting).	Ongoing	Principal Contractor
	The on-going conformity of plant retrofitted with DPF, to a defined performance standard will be ensured through a programme of onsite checks	Ongoing	Principal Contractor
	Implementation of fuel conservation measures including instructions to throttle down or switch off idle construction equipment; switch off the engines of trucks while they are waiting to access the site and while they are being loaded or unloaded, ensure equipment is properly maintained to ensure efficient fuel consumption	Ongoing	Principal Contractor
	Regular servicing and checks of all plant/equipment e.g. black smoke from exhausts	Ongoing	Principal Contractor
Site Activities	Temporary cover, screen or revegetate earthworks/stockpiles, if possible, as soon as is practicable. A low maintenance grass mix will be sown as soon as possible after creation of any soil storage mounds which are intended to remain in situ for more than 6 months or over the winter period. The optimum months for sowing grass seed are April or September to October.	As needed	Principal Contractor
	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.	As needed	Site Manager/Principal Contractor
	Wetting/dampening of dust generating stockpiles	As needed	Principal Contractor
	Stockpiles would be kept in place for the shortest possible time.	Ongoing	Principal Contractor
	Dust-generating activities will be minimised.	Ongoing	All personnel
	Where diesel- or petrol-powered generators are used, best practice measures will be implemented including regular inspections with respect to black smoke and siting away from pedestrian areas.	Ongoing	Principal Contractor
	Fine powder material (e.g bulk cement/grouts) to be delivered in enclosed tankers and stored in silos with	Ongoing	Principal Contractor

Mitigation Measure - Category	Description	Timing	Responsibility
	suitable emission control systems to prevent escape of material and overfilling during delivery.		
	For smaller supplies of fine powder materials, ensure bags are sealed after use and stored appropriately to prevent dust release.	Ongoing	Principal Contractor
	Inspections and monitoring to be undertaken as set out in Section 9 of this AQMP.	Ongoing	Principal Contractor

70. In addition to the above mitigation, a Traffic Management Plan (EA3-GRD-CON-PLN-IBR-000105) and a Travel Plan (EA3-OND-CNS-REP-IBR-000010) have been developed to manage the sustainable delivery of goods and materials and to support and encourage sustainable travel for contractor operatives and staff (public transport, cycling and car-sharing[2](subject to Covid-19 restrictions)) and thereby minimise the associated air quality impacts.

9. MONITORING

71. The principal purpose of monitoring will be to ensure that the mitigation measures on site are effective in the management of dust propagation.

72. If the 'ongoing' controls detailed in Section 8 are implemented appropriately during the onshore construction works, then likely dust generation and other emissions from the construction site will be minimised and rendered 'not significant'. However, site inspections and visual monitoring will be undertaken as an effective way to verify that air pollution control measures have been properly designed and implemented. This will also inform whether supplementary controls (i.e. those marked as 'as necessary' or 'as needed' are required. This process is illustrated in Appendix A.

73. Details of the monitoring programme are provided below.

9.1. Visual Inspections

74. Visual inspections for dust generated from haul trucks, vehicle traffic, earthworks and other relevant activities will be undertaken every morning and afternoon and observations recorded after each inspection. These inspections will be undertaken in the vicinity of the working site boundary (external and internal), and where these checks indicate the potential for off-site dust impacts, then at sensitive receptor locations within proximity of the site (subject to landowner approval) – as outlined in Table 9-1 and illustrated in Figure 2 Sensitive Receptor Locations.

75. ***Table 9-1 Discrete Sensitive Receptor Details for Visual Inspections***

Sensitive Receptor	X	Y	Address	Type
SR1	610342	246186	Off Bullen Lane, Bramford	Unknown Business
SR2	610288	246602	Bullen Hall Farm, Bullen Lane, Bramford	Residential Property
SR3	609598	246813	Woodlands Farm, Tye Lane, Bramford	Residential Property

76. The visual inspections will check for the presence of deposited dust on surrounding surfaces (cars and vegetation) within 100m of the Site and subject to landowner approval, if site inspections indicate off-site deposition is a possibility. If dust is noticed, or there is deemed to be a 'dust episode' then this will be recorded and the information made available to MSDC on request. The source(s) of emissions will be investigated to determine if any site activity is responsible, with remedial action taken and documented. The dust record should include:

- Time and date;
- Confirmation of any visible dust sources;
- Remedial actions taken if on-site emissions observed; and

[2] Walking is not considered a viable option to the Converter Station site due *inter alia* to Bullen Lane being a single carriageway road with blind bends and no pedestrian walkways

- Wind direction and strength.

77. The frequency of visual inspections will be increased when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions particularly when in close proximity to receptors. The weather forecasts will be checked in advance to determine the potential for high-risk dust events (e.g. dry weather and strong winds towards sensitive receptors). Forecasts will be used to trigger for preventive dust management action to be taken. In some cases there may be an opportunity to modify (or delay) potentially dusty site activities until the risk has reduced.

9.2. Site and Equipment Audits

78. Application of the controls detailed in Table 8-1 will be monitored regularly by the Principal Contractor, Site Manager and Environmental Clerk of Works (EnvCoW) throughout the construction phase, as set out in the Project Environmental Management Plan (Appendix 10 of the CoCP) and Contractors' Construction Environmental Management Plans. If non-conformity with any of the control and mitigation measures is identified, it will be recorded and appropriate remedial actions will be implemented.

79. Any incidents that cause dust and/or air quality emissions and remedial actions shall be recorded.

80. Site inspections should verify if vehicle traffic and/or NRMM emissions are consistently black. This is a signal that an engine is not operating optimally which should be turned off until rectified.

10. RESPONSIBILITIES

10.1. Implementation

81. The responsibility for ensuring this AQMP is adhered to lies with the Principal Contractor, Site Manager and EnvCoW. They will be assisted by the Contractor's Site Manager. There shall be a competent person on site during working hours responsible for the dust management measures. Responsibilities will be allocated to specific personnel to ensure dust generation is effectively controlled.

10.2. Roles and Responsibilities

82. The persons nominated to be responsible for tasks as defined in this AQMP are outlined below:

- EnvCoW:
  - Responsible for the implementation of this plan and preparing reports to the client and the stakeholders as required;
  - Responding to complaints in consultation with the Site Manger and informing the relevant stakeholders of the complaint, the source of the complaint and any action which was taken;
  - Ensures any complaints are responded to promptly by the Contractor's Site Manager; and
  - The EnvCoW will normally be a person located centrally within the developer's management structure. Alternatively, a member of the site team could be designated EnvCoW for the site, they should however be a different person to the Contractor's Site Manager.
- Site Manager:
  - Ensure mitigation measures are in place and that the AQMP is being followed. This should be undertaken in consultation with the EnvCoW; and
  - Responding to complaints, assisting with the investigation as to the causes of complaints, and ensuring appropriate mitigation measures are being used or employ further measures if required in consultation with the EnvCoW and MSDC.

10.3. Training

83. All employees, contractors and staff working on site will undergo site induction training, which will include environmental awareness training, including an understanding of air quality management issues. Individually focussed toolbox talks will also be required to be delivered by those contractors involved in the activities most likely to impact on the air quality.

84. The training will provide specific instructions about:

- Requirement for dust suppression at all times;
- How to avoid and suppress dust across worksite;
- Available dust suppression options;
- Work methods to prevent dust generation, such as maintaining site speed limits;

- Covering trucks loads;
- Cleanliness of vehicles, prior to exiting site;
- Road cleanliness, with regard to vehicles leaving the site onto public roads;
- Sensitive areas / receptors;
- Potential for condition changes and response strategies in windy conditions; and
- The importance of equipment maintenance.

85. Plant and equipment operators will be trained and experienced in the plant that they operate. Certification will be held on-site and available for inspection.

86. The importance of working to the requirements of the AQMP will be communicated at staff inductions and during daily activity briefings when activities that may create dust are to be undertaken.

11. COMMUNUCATION

87. The following measures are mandatory and relate specifically to communication and are the responsibility of the Contractor Site Manager and Principal Contractor.

- Display and name the contact details of Community Liaison Officer (CLO) on the construction site boundary. The location of these signs will be on fencing adjacent to the dust sensitive receptors; and
- Display the head or regional office contact information.

11.1. Community Liaison

88. EATL is committed to providing clear communication to local residents and will manage public relations with local residents and businesses that may be affected by construction dust. Proactive community liaison will be maintained, keeping local residents informed of the type and timing of works involved, paying particular attention to potential evening and night time works and activities which may occur in close proximity to receptors. As outlined in the Project Community and Public Relations Procedure (Appendix 8 of the CoCP), a combination of communication mechanisms such as posters, notices, exhibitions, letters, newsletters, website updates and parish council meetings will be employed to keep local residents and businesses informed.

11.2. Complaints Procedure

89. In order that dust complaints can be substantiated, it is imperative that EATL is immediately informed either by the complainant themselves or MSDC. An EA THREE Complaints Procedure will be published on the project website. This will set out how complaints will be managed and will state that all enquiries will be logged, investigated and rectifying action taken when deemed appropriate. The CLO's telephone number shall be clearly displayed at the site entrance and local residents should be encouraged to contact the CLO and/or MSDC in the event of dust soiling. In the event of an emergency outside of normal office hours, the CLO's telephone number will be directed through to an on-duty member of the construction team for resolution.

90. The Principal Contractor's Site Manager and the EnvCoW will record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken. All complaints regarding air quality and dust will be shared with MSDC, including a note of the actions taken and the measures to put in place to rectify any problem.

12. UPDATING THE AQMP

91. This AQMP is a 'live' document and as such it will be reviewed periodically; following any on-site incidents, changes in site operations or if elevated dust levels occur over a prolonged period requiring the AQMP to be updated. This will ensure that the AQMP will be updated with the release of new information.

92. Any updates will be agreed between EATL, Principal Contractor, Subcontractor/s and MSDC.

13. REFERENCES

Defra: Local Air Quality Management Technical Guidance 2016 (LAQM.TG.(16)) (2021).

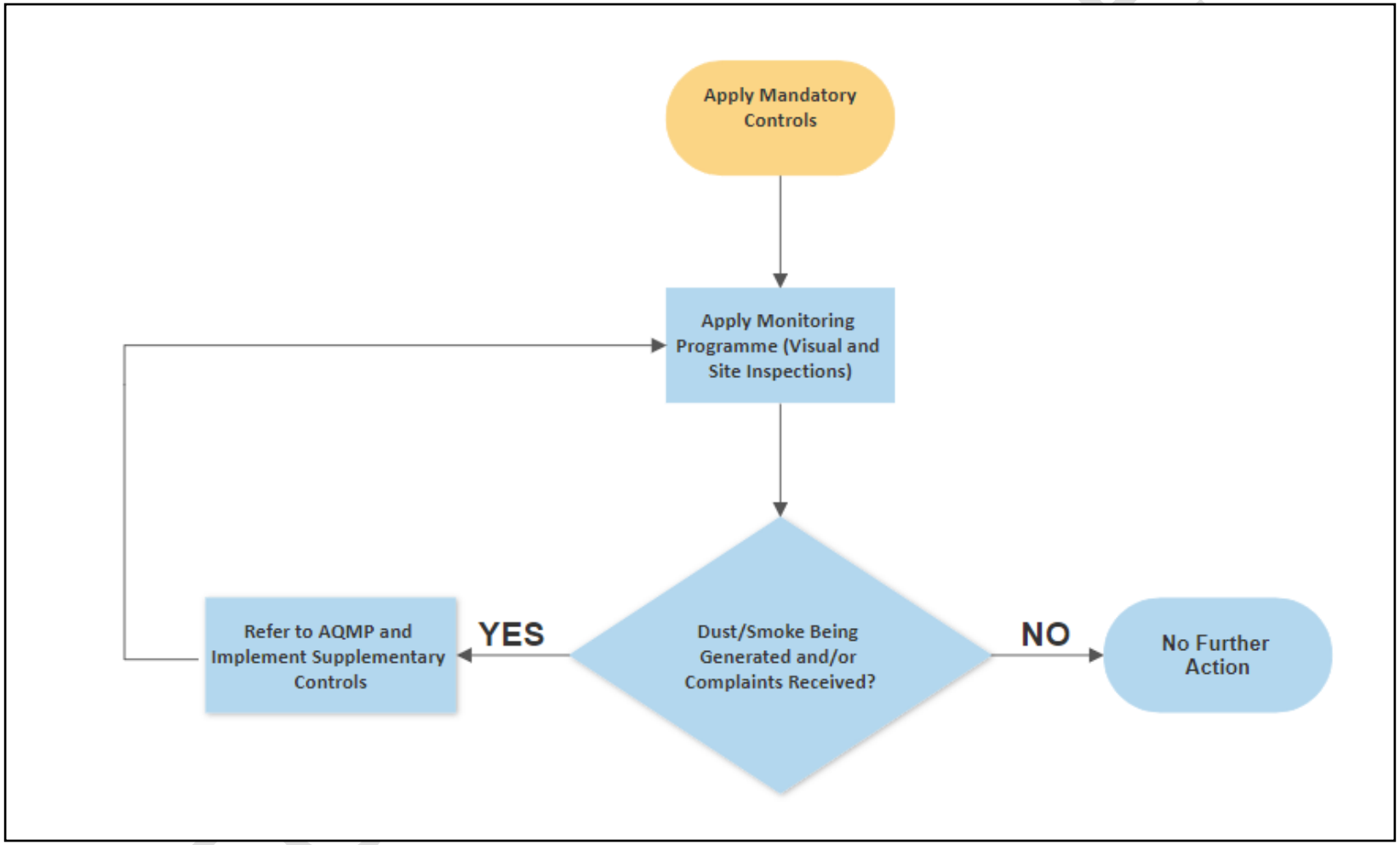
Environment Agency: Monitoring Particulate Matter in Ambient Air around Waste Facilities, (2013).

EPUK and IAQM Land Use Planning & Development Control: Planning for Air Quality, (2017).

IAQM. Guidance on the Assessment of Dust from Demolition and Construction, v1.1 (2016).

IAQM: Guidance on Monitoring in the Vicinity of Demolition and Construction Sites, v1.1 (2018).

APPENDIX A MONITORING CONTROL PROCEDURE



609000 609500 610000 610500

246500 246000

Track Track Track Track

BULLEN LANE BULLEN LANE

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936
Units: Meter

Works No.s Overview

Black Cottage Woodlands Farm Tye Lane Bullen Hall Farm Channel Hill Farm Burstallhill

69 65 64 67 62 63 66 68

EA THREE DCO Corridor
EA THREE Onshore Converter Station Layout Detail
EA THREE Onshore Converter Station Temporary Site Facilities Detail

EA THREE Converter Substation to National Grid Substation Cable Route
400kV AC Cable - Open Cut Section
400kV AC Cable - Ducted Section

EA THREE Onshore Converter Station Access Roads
Permanent
Temporary

EA THREE Cable Access Road
Haul Road
EA THREE Onshore Converter Station SUDs Pond
EA THREE Area to be Reprofiled

EA ONE Onshore Converter Station Access Road

Works No.s
65 62 66 63 67 64 68 69

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Rev	Date	By	Comment
B	04/04/2022	PW	Second Issue
A	31/03/2022	JRS	First Issue

Original A3 Plot Scale 1:5,000

0 100 200 Metres

Onshore Converter Station Stage

Figure 1: Site Context Plan

Drg No	05356.00006.12.0001.1 ONCS Site Context Plan
Rev	2
Date	04/04/2022
Layout	N/A

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608500 609000 609500 610000 610500 611000

247000 246500 246000 245500

SR3 SR2 SR1

TYE LANE
Guide Post
THE CHANNEL
Track
BULLEN LANE
Path (um)
GP

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936
Units: Meter

EA THREE DCO Corridor
EA THREE Onshore Converter Station Layout Detail
EA THREE Onshore Converter Station Temporary Site Facilities Detail

EA THREE Converter Substation to National Grid Substation Cable Route
400kV AC Cable - Open Cut Section
400kV AC Cable - Ducted Section

EA THREE Onshore Converter Station Access Roads
Permanent
Temporary

EA THREE Cable Access Road
Haul Road
EA THREE Onshore Converter Station SUDs Pond
EA THREE Area to be Reprofiled

EA ONE Onshore Converter Station Access Road
Extent of Potential Dust Sources
Extent of Potential Dust Effect
Sensitive Receptor

GoBe consultants

Rev	Date	By	Comment
B	06/04/2022	PW	Second Issue
A	20/12/2021	PW	First Issue

Original A3 Plot Scale 1:7,500

0 150 300 Metres

Onshore Converter Station Stage

Figure 2: Air Quality Sensitive Areas

Drg No	05356.00006.12.0023.1 Air Quality Sensitive Areas
Rev	2
Date	06/04/2022
Layout	N/A

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