LAND AT CHANNEL VIEW, GRANGETOWN CARDIFF

ENVIRONMENTAL STATEMENT

VOLUME 2
CHAPTER 6: AIR QUALITY

INTRODUCTION

6.1 The author of the ES Chapter and Air Quality Technical Report Faith Doran has 1 years' experience in undertaking Air Quality Assessments. The reviewer Nigel Mann has over 20 years' experience a M.Sc. Environmental Science and is an Associate member of the Institute of Environmental Management and Assessment (AIEMA).

6.2 This chapter of the ES assesses the likely significant effects of the Development on the environment in respect of Air Quality. This chapter has been prepared by Tetra Tech and sets out the methodology followed in undertaking the assessment and provides a review of the baseline features and resources of the Site and surrounding area.

6.3 The effects of the Development on existing receptors have been established based on an assessment of the range of uses set out within the Development description. Where relevant, mitigation measures are proposed to minimise any adverse effects of the Development during both the construction and operational phases. The likely significant residual effects of the Development are then stated.

LEGISLATIVE AND POLICY CONTEXT

Global Policy

6.4 World Health Organization (2006) WHO Air Quality Guidance for Particulate Matter, Ozone, Nitrogen Dioxide and Sulphur Dioxide: Summary of Risk Assessment[1].

6.5 The WHO air quality guidelines are designed to offer guidance in reducing the health impacts of air pollution. WHO has undertaken to review the accumulated scientific evidence and to consider its implications for its air quality guidelines. The result of this work is presented in this document in the form of revised guideline values for selected air pollutants, which are applicable across all WHO regions. These guidelines are intended to inform policymakers and to provide appropriate targets for a broad range of policy options for air quality management in different parts of the world.

6.6 The Air Quality Objective's (AQO's) for pollutants included within the Air Quality Strategy[2] and assessed as part of the scope of this report are presented in Table 2.1 and Table 2.2 of the Air Quality Technical Report (Appendix .1). This is along with the European Commission (EC) Directive Limits[3] and World Health Organisation (WHO) Guidelines. The ecological levels used within this assessment are based on WHO and Convention on Long-range Transboundary Air Pollution (CLRTAP) guidance[4].

European Policy

6.7 European air quality legislation is consolidated under Directive 2008/50/EC[3], which came into force on 11th June 2008. This Directive consolidates previous legislation which was designed to deal with specific pollutants in a consistent manner and provides new air quality objectives for fine particulates. The consolidated Directives include:

- Directive 1999/30/EC – the First Air Quality "Daughter" Directive – sets ambient air limit values for NO2 and oxides of nitrogen, sulphur dioxide, lead and PM10;
- Directive 2000/69/EC – the Second Air Quality "Daughter" Directive – sets ambient air limit values for benzene and carbon monoxide; and,
- Directive 2002/3/EC – the Third Air Quality "Daughter" Directive – seeks to establish long-term objectives, target values, an alert threshold and an information threshold for concentrations of ozone in ambient air.
- The fourth daughter Directive was not included within the consolidation and is described as:

---

[1] Air Quality Guidelines – Global Update 2005 https://www.who.int/airpollution/publications/aqg2005/en/

[2] Defra (2007) The Air Quality Strategy for England, Scotland, Wales and Northern Ireland

[3] The European Parliament and the Council of the European Union (2008) *Directive 2008/50/EC of the European Parliament and of the Council*

[4] Convention on Long-Range Transboundary Air Pollution http://www.apis.ac.uk/overview/regulations/overview_clrtap.htm

- Directive 2004/107/EC – 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.

UK Legislation

6.8 The Air Quality Standards Regulations (Amendments 2016)[5] seek to simplify air quality regulation and provide a new transposition of the Air Quality Framework Directive, First, Second and Third Daughter Directives and also transpose the Fourth Daughter Directive within the UK. The Air Quality Limit Values are transposed into the updated Regulations as Air Quality Standards, with attainment dates in line with the European Directives. SI 2010 No. 1001, Part 7 Regulation 31 extends powers, under Section 85(5) of the Environment Act (1995)[6], for the Secretary of State to give directions to Local Authorities (LAs) for the implementation of these Directives.

6.9 The UK Air Quality Strategy is the method for implementation of the air quality limit values in England, Scotland, Wales and Northern Ireland and provides a framework for improving air quality and protecting human health from the effects of pollution.

6.10 For each nominated pollutant, the Air Quality Strategy sets clear, measurable, outdoor air quality standards and target dates by which these must be achieved; the combined standard and target date is referred to as the Air Quality Objective (AQO) for that pollutant. Adopted national standards are based on the recommendations of the Expert Panel on Air Quality Standards (EPAQS). The AQOs for pollutants included within the Air Quality Strategy and assessed as part of the scope of this report are presented in Table 6.1 and Table 6.2 along with European Commission (EC) Directive Limits and World Health Organisation (WHO) Guidelines. The ecological levels are based on WHO and CLRTAP guidance.

Table 6.1 - Air Quality Standards, Objectives, Limit and Target Values

Pollutant	Applies	Objective	Concentration Measured as10	Date to be achieved and maintained thereafter	European Obligations	Date to be achieved and maintained thereafter	New or existing

[5] The Air Quality Standards Regulation (2016) https://www.legislation.gov.uk/uksi/2016/1184/contents/made

[6] UK Legislation (1995). Environment Act.

PM_{10}	UK	50µg/m^3 by end of 2004 (max 35 exceedances a year)	24-hour Mean	1st January 2005	50µg/m^3 by end of 2004 (max 35 exceedances a year)	1st January 2005	Retain Existing
	UK	40µg/m^3 by end of 2004	Annual Mean	1st January 2005	40µg/m^3	1st January 2005	
$PM_{2.5}$	UK	25µg/m^3	Annual Mean	31st December 2010	25µg/m^3	1st January 2010	Retain Existing
NO_2	UK	200µg/m^3 not to be exceeded more than 18 times a year	1-Hour Mean	31st December 2005	200µg/m^3 not to be exceeded more than 18 times a year	1st January 2010	Retain Existing
	UK	40µg/m^3	Annual Mean	31st December 2005	40µg/m^3	1st January 2010	

Table 6.2 - Ecological Air Quality Standards, Objectives, Limit and Target Values

Pollutant	Applies	Objective	Concentration Measured as
NOX	UK	30µg/m3	Annual Mean

Local Air Quality Management

6.11 Under Section 82 of the Environment Act (Part IV) 1995 Local Authorities (LAs) are required to periodically review and assess air quality within their area of jurisdiction under the system of Local Air Quality Management (LAQM). This review and assessment of air quality involves assessing present and likely future air quality against the AQOs. If it is predicted that levels at the façade of buildings where members of the public are regularly present (normally residential properties) are likely to be exceeded, the LA is required to declare an Air Quality Management Area (AQMA). For each AQMA, the LA is required to produce an Air Quality Action Plan (AQAP), the objective of which is to reduce pollutant concentrations in pursuit of the AQOs.

6.12 The assessments have indicated that concentrations of NO_2 are above the relevant AQOs at seven locations of relevant public exposure within the authority area. Cardiff Council has seven designated Air Quality Management Area (AQMA) for NO_2 as follows:

- Ely Bridge AQMA 1: A number of residential premises along the A48 Cowbridge Road West, Western Avenue and A4119 through Llandaff Village Cardiff Road.

- St Mary Street AQMA: An area encompassing St Mary Street, Cardiff and properties on either side of the road.
- Stephenson Court AQMA: From NE and NW boundaries of Stephenson Court, NW boundary of Burgess Court, NW and SW boundaries of Four Elms Court, SW corner of Four Elms Court south across Newport road to the junction with Orbit street, West across Newport Road to the SE corner of Stephenson Court.
- Newport Road AQMA: A number of residential properties along the A4161 Newport Road, Cardiff.
- The Philog AQMA: A number of residential premises along the A470 Manor Way, The Philog, Birchgrove Road and Caerphilly Road.
- Llandaff AQMA: Centre on Cardiff Road through Llandaff village.
- Cardiff City Centre AQMA: Former St Mary Street AQMA with the addition of Westgate Street in Cardiff City Centre.

6.13 The application site is not situated within any of the Cardiff Council AQMA's but is located approximately 1.5 km away from Cardiff City Centre AQMA. Proposed traffic data provided by Cambria consulting Ltd indicated that there will be less than 100AADT, associated with the development, entering any of the above mentioned AQMA's. As stated within the IAQM Land Use planning for Development and Control: Planning for Air Quality guidance[7], where the additional vehicle movements are below the criteria set in Table 6.2 of the guidance, then impacts within the AQMA's are considered to be negligible. As there are less than 100AADT entering the AQMA's then the impacts within them are considered insignificant.

6.14 The Cardiff Council Clean Air Strategy and Action Plan[8] has been reviewed. These documents outline the methods which will be followed to achieve the AQO's within the boroughs as quickly as possible through sustainable travel measures, measures to reduce traffic congestion and increase electric vehicle travel.

Planning Policy

6.15 Section 38(6) of the Planning and Compulsory Purchase Act 2004[9] and Section 70(2) of the Town & Country Planning Act 1990[10] require that planning applications to be determined in accordance with the statutory development plan, unless material considerations indicate otherwise.

[7] Institute of Air Quality Management, (2017). *Land-Use Planning & Development Control: Planning For Air Quality v1.2*.

[8] Cardiff Council Clean Air Strategy and Action Plan, March 2019

[9] Planning and Compulsory Purchase Act 2004, https://www.legislation.gov.uk/ukpga/2004/5/pdfs/ukpga_20040005_en.pdf

[10] Town & Country Planning Act 1990, https://www.legislation.gov.uk/ukpga/1990/8/contents

Cardiff Council Local Plan

6.16 Cardiff Council's (CC) Local Development Plan – adopted January 2016[11], has been reviewed which outlines the Council's broad planning strategy. Following this review of policies, the following was identified as being relevant to the proposed development from an air quality perspective:

"KP18: Natural Resources;

In the interests of the long-term sustainable development of Cardiff, development proposals must take full account of the need to minimise impacts on the city's natural resources and minimise pollution, in particular the following elements:

i. Protecting the best and most versatile agricultural land;
ii. Protecting the quality and quantity of water resources, including underground surface and coastal waters;
iii. Minimising air pollution from industrial, domestic and road transportation sources and managing air quality; and
iv. Remediating land contamination through the redevelopment of contaminated sites."

[11] Cardiff Local Development Plan 2006-2026, Adopted January 2016

ASSESSMENT METHODOLOGY

Construction Phase

6.17 The construction phase assessment is undertaken in accordance with the IAQM Guidance on the Assessment of Dust from Demolition and Construction document published in February 2014[12].

6.18 The development will neither cause a significant change in Light Duty Vehicles (LDV) traffic flows within the AQMA of more than 100 Annual Average Daily Traffic (AADT) nor cause a significant change in Heavy Duty Vehicles (HDV) flows within the AQMA of more than 25 AADT.

Ecological Receptors

6.19 Air quality impacts associated with the proposed re-development have the potential to impact on receptors of ecological sensitivity within the vicinity of the site. The IAQM guidance on 'Air Quality Impacts on Designated Nature Conservation Sites' (2020)[13] document outlines the types of designated nature sites within 2 km of the proposed development which require air quality assessment. These are inclusive of:

- Sites of Special Scientific Interest (SSSIs);
- Special Areas of Conservation (SACs);
- Special Protection Areas (SPAs);
- Ramsar Sites;
- Areas of Special Scientific Interest (ASSIs);
- National Nature Reserves (NNRs);
- Local Nature Reserves (LNRs);
- Local Wildlife Sites (LWSs); and,
- Areas of Ancient Woodland (AW).

6.20 The Conservation of Habitats and Species Regulations (2019)[14] additionally requires competent authorities to review planning applications and consents that have the potential to impact on European designated sites (e.g. Special Protection Areas).

6.21 It should be noted that the IAQM Guidance[13] only requires the assessment of ecological receptors which are located within 200m of the road network.

---

[12] Institute of Air Quality Management (2014). *Guidance on the assessment of dust from demolition and construction*.

[13] Institute of Air Quality Management (2020). *A guide to the assessment of air quality impacts on designated nature conservation sites.*

[14] Conservation of Habitats and Species Regulations (2017) Amended (2019)

Sensitive Receptors

6.22 The Design Manual for Roads and Bridges (DMRB)[15] considers any receptor within 200m of a road source to be potentially affected by that operation. These receptors are shown both in Figure 1 (of Technical Appendix 6.1) Table 6.10. The AQOs only apply at locations where the public may be exposed to pollution for a sufficient period for there to be any measurable health impact. The averaging period and AQO involved will determine which locations are considered to be sensitive receptors. For annual mean NO_2 and particulate matter with mean hydraulic diameter of less than 10µg/m^3 AQOs, LAQM.TG (16)[16] considers typical locations for sensitive receptors to include:

- Residential properties;
- Hospitals;
- Schools; and,
- Care homes.

6.23 Details of the sensitive receptors in terms of NO_2, PM_{10} and $PM_{2.5}$ exposure, the impact description of effects of changes in traffic flow as a result of the proposed development is determined to be 'negligible' at all existing sensitive receptors.

[15] Highways Agency et al. (2019) *Design Manual for Roads and Bridges (DMRB) Volume 10 Environmental Design and Management.*

[16] Defra, Local Air Quality Management Technical Guidance (TG16) February 2018

Operational Phase

6.24 The operational phase assessment consists of the quantified predictions of the change in nitrogen dioxide and particulate matter for the operational phase of the Proposed Development due to changes in traffic movement. Predictions of air quality at the Site have been undertaken for the operational phase of the development using the air quality modelling software ADMS-Roads 5.0.

6.25 In accordance with the provided traffic data, the operational phase assessment has been undertaken with an assumed operational opening year of 2026. The assessment scenarios are therefore:

- 2018 Baseline = Existing Baseline Conditions (2018)
- 2026 "Do Minimum" = Baseline Conditions + Cumulative Development Flows; and,
- 2026 "Do Something" = Baseline Conditions + Cumulative Development + Proposed Development.

6.26 Baseline 2018 data and projected 2026 'do minimum' and 'do something' traffic data has been obtained for the operational phase assessment in the form of Annual Average Daily Traffic figures (AADT).

6.27 2018 Baseline, 2026 'do minimum' and 'do something' traffic data have been provided by Cambria Consulting Ltd. For road links that were not provided by the transport consultant, 2018 baseline traffic data has been downloaded from the Department for Transport (DfT) database. Where no traffic flow data was available from the Transport Consultant or DfT database, a representative traffic flow has been used.

6.28 Emission factors for the 2018 baseline and 2026 projected 'do minimum' and 'do something' scenarios have been calculated using the Emission Factor Toolkit (EFT) Version 10.1 (August 2020).

Significance Criteria

Construction Phase

6.29 The construction phase assessment utilises the IAQM Guidance[12]. Table 6.2 illustrates the receptor sensitivity for the construction phase assessment.

Table 6.2 - Receptor Sensitivity Descriptors

Magnitude	Description
High	Users can reasonably expect an enjoyment of a high level of amenity; The appearance, aesthetics or value of their property would be diminished by soiling; and the people or property would reasonably expect to be present continuously, or at least regularly for extended periods, as part of the normal pattern of use of the land; and Indicative examples include dwellings, museums and other culturally important collections, medium- and long-term car parks and car showrooms.
Medium	Users can reasonably expect to enjoy a reasonable level of amenity, but would not reasonably expect to enjoy the same level of amenity as in their home; The appearance, aesthetics or value of their property could be diminished by soiling; The people or property wouldn't reasonably be expected to be present here continuously or regularly for extended periods as part of the normal pattern of use of the land; and, Indicative examples include parks and places of work.
Low	The enjoyment of amenity would not reasonably be expected; Property would not reasonably be expected to be diminished in appearance, aesthetics or value by soiling; There is transient exposure, where the people or property would reasonably be expected to be present only for limited periods of time as part of the normal pattern of use of the land; and, Indicative examples include playing fields, farmland (unless commercially sensitive horticultural), footpaths, short term car parks and roads.

6.30 The sensitivity of the area should be derived for each of the four activities: Demolition, construction, earthworks and trackout. Table 6.3 illustrates how the sensitivity of the area to dust soiling effects on people and property are defined.

Table 6.3 - Sensitivity of the Area to Dust Soiling Effects on People and Property

Receptor Sensitivity	**Number of Receptors**	**Distance from the Source (m)**			
		<20	**<50**	**<100**	**<350**
High	>100	High	High	Medium	Low
	10-100	High	Medium	Low	Low
	1-10	Medium	Low	Low	Low
Medium	>1	Medium	Low	Low	Low
Low	>1	Low	Low	Low	Low

Note - The likely routes the construction traffic will use, should also be included to enable the presence of trackout receptors to be included in the assessment. As a general guidance, without site-specific mitigation, trackout may occur along the public highway up to 500m from large sites, 200m from medium sites and 50m from small sites, as measured from the site exit.

Table 6.4 - Sensitivities of People to the Health Effects of PM_{10}

Magnitude	**Description**
High	Locations where members of the public are exposed over a time period relevant to the air quality objective for PM_{10} (in the case of the 24-hour objectives, a relevant location would be one where individuals may be exposed for eight hours or more in a day); Indicative examples include residential properties. Hospitals, schools and residential care homes should also be considered as having equal sensitivity to residential areas for the purposes of this assessment.
Medium	Locations where the people exposed are workers, and exposure is over a time period relevant to the air quality objective for PM_{10} (in the case of the 24-hour objectives, a relevant location would be one where individuals may be exposed for eight hours or more in a day); and, Indicative examples include office and shop workers but will generally not include workers occupationally exposed to PM_{10}, as protection is covered by Health and Safety at Work legislation.
Low	Locations where human exposure is transient; and, Indicative examples include public footpaths, playing fields, parks and shopping streets.

6.31 The sensitivity of the area should be derived for each of the four activities: Demolition, construction, earthworks and trackout. Table 6.5 illustrates how the sensitivity of the area to human health impacts are derived.

Table 6.5 - Sensitivity of the Area to Human Health Impacts

Receptor Sensitivity	**Annual Mean PM_{10} Concentration**	**Number of Receptors**	**Distance from the Source (m)**				
			<20	**<50**	**<100**	**<200**	**<350**
High	>32 µg/m^3	>100	High	High	High	Medium	Low
	28 - 32 µg/m^3	10-100	High	High	Medium	Low	Low
	24 – 28 µg/m3	1-10	High	Medium	Low	Low	Low
	<24 µg/m3	>100	High	High	Medium	Low	Low
Medium	-	10-100	High	Medium	Low	Low	Low
	-	1-10	High	Medium	Low	Low	Low
Low	-	>100	High	Medium	Low	Low	Low

Note - The likely routes the construction traffic will use should also be included to enable the presence of trackout receptors to be included in the assessment. As a general guidance, without site-specific mitigation, trackout may occur along the public highway up to 500m from large, 200m from medium sites and 50m from small sites, as measured from the site exit.

Table 6.6 - Sensitivities of Receptors to Ecological Effects

Magnitude	**Description**
High	• Locations with an international or national designation and the designated features may be affected by dust soiling; • Locations where there is a community of a particularly dust sensitive species such as vascular species included in the Red Data List for Great Britain; and • Indicative examples include a Special Area of Conservation (SAC) designated for acid heathlands or a local site designated for lichens adjacent to the demolition of a large site containing concrete (alkali) buildings.
Medium	• Locations where there is a particularly important plant species, where its dust sensitivity is uncertain or unknown; Locations with a national designation where the features may be affected by dust deposition.
Low	• Locations with a local designation where the features may be affected by dust deposition; and

	• Indicative example is a Local Nature Reserve with dust sensitive features.

6.32 The sensitivity of the area should be derived for each of the four activities: Demolition, construction, earthworks and trackout.

6.33 This assessment determines the risk level of the construction impacts. Any significant effects during the construction phase are considered negligible following mitigation.

Operational Phase

6.34 The significance of the effects during the operational phase of the Proposed Development is based on the latest guidance produced by EPUK and IAQM in January 2017[7]. The guidance lays a basis for

6.35 a consistent approach that can be used by all parties associated with the planning process to professionally judge the overall significance of the air quality effects based on severity of air quality impacts. This significance criteria guidance has been used within the Air Quality Assessment.

Effect Magnitude

6.36 Table 6.7 provides the criteria used for the classification of the magnitude of likely significant air quality impacts.

Table 6.7 - Method for Assessing Magnitude of Likely Significant Impacts on Air Quality

Magnitude	Description	Examples
Large	Impact resulting in a considerable change in baseline environmental conditions with severe undesirable/desirable consequences on the receiving environment.	Air quality varies between the do minimum and do something by more than 10% of the air quality criterion (Emissions). Substantial risk that emissions will generate statutory nuisance complaints, resulting in formal action (Construction).
Medium	Impact resulting in a discernible change in baseline environmental conditions with undesirable/desirable conditions	Air quality varies between the do minimum and do something by 5 - 10% of the air quality criterion (Emissions). Moderate risk that emissions will generate statutory nuisance complaints, resulting in formal action (Construction).
Small	Impact resulting in a discernible change in baseline environmental conditions with undesirable/desirable conditions that can be tolerated.	Air quality varies between the do minimum and do something by 2 - 5% of the air quality criterion (Emissions).

		Slight risk that emissions will generate statutory nuisance complaints, resulting in formal action (Construction).
Imperceptible	Very low discernible change in baseline environmental conditions.	Air quality varies between the do minimum and do something by less than 1-2% of the air quality criterion (Emissions). Little or no cause for nuisance complaints to be made (Construction).
Neutral	No change in baseline conditions	Air quality varies between the do minimum and do something by less than 0.5% of the air quality criterion (Emissions).

NOTES:

(1) An impacts magnitude can be either positive or negative.

(2) If the assessor is certain that a receptor or attribute of a feature will suffer no impact whatsoever then the term 'No Impact' can be used in the place of 'Imperceptible Impact'. However, it is not usually possible to determine 'No Impact' in many cases with 100% certainty so the term 'Imperceptible' should be used in these cases.

6.37 It is recognised that likely significant air quality impacts can operate over a range of geographical areas and therefore a geographical scale may be taken into account in describing the scale/magnitude of the likely significant impact.

Receptor Sensitivity

6.38 Receptors can demonstrate different sensitivities to changes in their environment. For the purpose of this assessment sensitivity is determined as Very High, High, Medium or Low as detailed in Table 6.8 for both the construction and operational phase of the development.

Table 6.8 - Methodology for Assessing Sensitivity of Receptor

Sensitivity	**Criteria**
Very High	• 'Do Minimum' pollutant concentrations greater than 110% of the relevant AQO (Emissions). • Receptors of very high sensitivity to dust and odour, such as: hospitals and clinics, retirement homes, painting and furnishing, hi-tech industries and food processing (Construction). • Densely populated areas – more than 100 dwellings within 20m of the development site (Construction).
High	• 'Do Minimum' pollutant concentration between 103 - 109% of the relevant AQO (Emissions). • Receptors of high sensitivity to dust and odour, such as: schools, residential areas, food retailers, glasshouses and nurseries, horticultural land and offices (Construction). • Densely populated areas – 10-100 dwellings within 20m of the development site (Construction).
Medium	• 'Do Minimum' pollutant concentration between 95 - 102% of the relevant AQO

	(Emissions). • Receptors of medium sensitivity to dust and odour, such as: farms, outdoor storage, light and heavy industry (Construction). • Suburban or edge of town areas (Construction).
Low	• 'Do Minimum' pollutant concentration between 75-94% of the relevant AQO (Emissions) • All other dust/odour sensitive receptors not identified above (Construction). • Rural/Industrial areas (Construction).
Negligible	• 'Do Minimum' pollutant concentration less than 75% of the relevant AQO (Emissions) • Receptor more than 350m away (construction)

Effect Significance

6.39 The level of significance of each likely impact is determined by combining the likely significant impact risk with the sensitivity of the receptor during the operational phase. Table 6.9 shows how the interaction of magnitude and sensitivity results in the significance of an environmental impact. If the scale of the impact magnitude is negative, then the resulting impact is adverse. If the scale of the impact magnitude is positive, then the resulting impact is beneficial. The table has been developed by Tetra Tech, but the matrix combinations and terms used correlate with the significance matrix recommended by Land-Use Planning & Development Control: Planning for Air Quality (2017)[7].

Table 6.9 - Impact Significance Matrix

Sensitivity of Receptor	**Criteria**				
	Large	**Medium**	**Small**	**Imperceptible**	**Neutral**
Very High	Substantial	Substantial	Substantial	Moderate	Negligible
High	Substantial	Substantial	Moderate	Moderate	Negligible
Medium	Substantial	Moderate	Moderate	Slight	Negligible
Low	Moderate	Moderate	Slight	Negligible	Negligible
Negligible	Moderate	Slight	Negligible	Negligible	Negligible

6.40 If the significance of the effect is moderate or substantial, then the effect is considered to be significant in terms of the local air quality, whether beneficial or adverse.

6.41 If the magnitude of change is Moderate to Substantial then the change is considered to have a significant effect on the local air quality, whether positive or negative.

Consultation

6.42 A scoping opinion for the development was provided by Cardiff Council on the 6th January 2020. This confirmed the requirement of an Air Quality Chapter to be included within the ES.

6.43 A pre application response was provided by Cardiff Council, reference PA/20/00054/MJR, dated the 6th of July 2020. The response in relation to Air Quality was regarding the proposed traffic data obtained from Department of Transports (DoT's) Road Traffic Statistics Manual Council Points in addition to the traffic data provided by the transport consultant. This assessment has used traffic data provided by the transport consultant, and where traffic data was unavailable for the baseline year, the DoT's traffic counts have been used.

Limitations and Assumptions

6.44 A number of assumptions have been made during the assessment. The assumptions are:

- The assessment has assumed that background air quality for the year of completion of the Development will remain the same as 2018 background to produce a worst-case assessment This worst-case nature of the assessment is due to the phasing out of petrol/diesel vehicles and increased use of electric vehicles expected to improve air quality conditions;
- It is assumed that the approved development will take place in conjunction with neighbouring developments, these have been considered for likely significant cumulative effects with the Development. Developments which are predicted to have a cumulative effect have been outlined in Chapter 5: Traffic and Transport; and
- Information provided by third parties, including publicly available information and database is correct at the time of the preparation of this assessment

6.45 The assessment has been subject to the following limitations:

- Baseline conditions are accurate at the time of undertaking this assessment but, due to the dynamic nature of the environment, conditions may change during the Site preparation, construction and operational phases;
- Baseline monitoring conditions monitored by the Local Authority only provide monitored concentrations in the locations determined by CC. However, any independent monitoring undertaken during 2020 will have been affected by the global COVID-19 pandemic, and may be determined to not be representative. Therefore, the Air Quality monitoring undertaken by CC in 2018 is determined to be the worst case, and representative monitoring data available; and,
- Model limitations: Since models approximate natural phenomena, the mathematical parameters used in models to represent real processes are often uncertain. However, models are very powerful tools to represent natural processes and potential uncertainties in model results have been minimised as far as practicable and worst-case inputs considered in order to provide a robust assessment.

BASELINE CONDITIONS

Existing Conditions

6.45 Baseline air quality in the vicinity of the Proposed Development site has been defined from a number of sources, as described in the following sections.

Air Quality Review and Assessment

6.46 As required under section 82 of the Environment Act 1995, Cardiff Council (CC) has conducted an ongoing exercise to review and assess air quality within its area of jurisdiction. CC has seven designated Air Quality Management Areas for NO_2 as follows:

- Ely Bridge AQMA 1: A number of residential premises along the A48 Cowbridge Road West, Western Avenue and A4119 through Llandaff Village Cardiff Road.
- St Mary Street AQMA: An area encompassing St Mary Street, Cardiff and properties on either side of the road.
- Stephenson Court AQMA: From NE and NW boundaries of Stephenson Court, NW boundary of Burgess Court, NW and SW boundaries of Four Elms Court, SW corner of Four Elms Court south across Newport road to the junction with Orbit street, West across Newport Road to the SE corner of Stephenson Court.
- Newport Road AQMA: A number of residential properties along the A4161 Newport Road, Cardiff.
- The Philog AQMA: A number of residential premises along the A470 Manor Way, The Philog, Birchgrove Road and Caerphilly Road.
- Llandaff AQMA: Centre on Cardiff Road through Llandaff village.
- Cardiff City Centre AQMA: Former St Mary Street AQMA with the addition of Westgate Street in Cardiff City Centre.

6.47 The application site is not situated within any of the CC AQMA's. but is located approximately 1.5 km away from Cardiff City Centre AQMA. Proposed traffic data provided by Cambria consulting Ltd indicated that there will be less than 100AADT, associated with the development, entering any of the above mentioned AQMA's. As stated within the IAQM Land Use planning for Development and Control: Planning for Air Quality guidance, where the additional vehicle movements are below the criteria set in Table 6.2 of the guidance, then impacts within the AQMA's are considered to be negligible. As there are less than 100AADT entering the AQMA's then the impacts within them are considered insignificant.

6.48 Background concentrations as used within the prediction calculations were referenced from the UK National Air Quality Information Archive database based on the National Grid Co-ordinates of 1 x 1 km grid squares nearest to the development site. In August 2020 Defra issued revised 2018 based background maps for NOX, NO_2, PM_{10} and $PM_{2.5}$ which incorporate updates to the input data used for modelling. NOx and $PM_{2.5}$ are included in the AQA Technical Report for reference, however,

there are no air quality objectives for NOx and there are modelling limitations for $PM_{2.5}$. As a result, $NO_2$and PM_{10} are the pollutants considered most relevant for this assessment and therefore have been modelled in the assessment. 2018 background maps have been utilised for the model verification and baseline operational phase assessment.

Air Quality Monitoring

6.49 Air Quality Monitoring within CC is conducted via non-continuous monitoring methods. The most recently available monitoring data is presented in Tables 6.10 and 6.11 below.

Non-continuous monitoring

Table 6.10 - Cardiff Council Diffusion tube Monitoring

Site ID	**Location**	**Site Type**	**Distance to Nearest Kerbside (m)**	**Inlet Height (m)**	**2018 Annual Mean NO_2 Concentration (µg/m3)**
49	Penarth Road	Roadside	7.0	1.5	27.3
147	211 Penarth Road	Roadside	7.0	1.5	29.3
148	161 Clare Road	Roadside	5.0	1.5	26.6
149	10 Corporation Road	Roadside	4.6	1.0	31.3
152	22 Clare Street	Roadside	6.0	2.0	27.8
202	James Street	Roadside	3.5	1.5	30.2

Continuous Monitoring

Table 6.11 Cardiff Council Automatic Monitoring

Site ID	Location	Site Type	Distance to Nearest Kerbside (m)	Inlet Height (m)	2018 Annual Mean NO_2 Concentration (µg/m3)
Cardiff Centre AURN	Cardiff City Centre	Urban Background	200	-	20
Cardiff Newport Road AURN	Newport Road	Roadside/ Urban Traffic	4.5	-	29

Traffic Emission Sources

6.50 Desktop assessment has identified that traffic movements are likely to be the most significant local source of pollutants affecting the Site and its surroundings. The principal traffic derived pollutant likely to impact local receptors is nitrogen dioxide (NO_2).

Meteorology

6.51 Meteorological conditions have significant influence over air pollutant concentrations and dispersion. Pollutant levels can vary significantly from hour to hour as well as day to day, thus any air quality predictions need to be based on detailed meteorological data. The ADMS model calculates the dispersion of pollutants on an hourly basis using a year of local meteorological data. The meteorological data used in the assessment is derived from Cardiff Airport Met Station, which is considered representative of the development site conditions, with all the complete parameters necessary for the ADMS model.

Sensitive Receptors for Traffic Air Quality

6.52 Receptors that are considered as part of the air quality assessment are primarily those existing receptors that are situated along routes predicted to experience significant changes in traffic flow as a result of the Proposed Development. Proposed receptor locations on the Proposed Development Site have also been considered within the assessment as well. These have been identified in the following sections.

Ecological Sensitive Receptors

6.53 A study was undertaken to identify any statutory designated sites of ecological or nature conservation importance within the extents of the dispersion modelling assessment. This was completed using the Multi-Agency Geographic Information for the Countryside (MAGIC)[17] web-based interactive mapping service, which draws together information on key environmental schemes and designations. Consultation with the project ecologists (HDA) has also been

[17] https://magic.defra.gov.uk/MagicMap.aspx

undertaken. Following a search within a 2 km radius of the site boundary, the following ecological receptor was identified.

Table 6.12 - Ecological Receptors

Site ID	Site	Designation	UK NGR (m)		Distance from Site (km)	Distance from Nearest Modelled Road (m)
			X	Y		
E1	Cwm Cydfin, Leckwith	SSSI	316646	173798	1.4	17

6.54 It should be noted that the IAQM Guidance[13] only requires the assessment of ecological receptors which are located within 200m of the road network. Due to the distance from the modelled road network, E1 identified within Table 6.12 has been included within the air quality assessment.

Future Baseline

6.55 Future baseline is accounted for in the modelled 'Do Minimum' scenario which takes into account the future baseline in 2026. The 'Do Minimum' scenarios are undertaken using a future baseline incorporating predicted increases in traffic movements associated with the committed developments listed in Chapter 5: Traffic and Transport.

6.56 In traffic movement terms, the 'future baseline' scenario would normally be determined by applying 'natural' traffic growth factors to baseline traffic data. Traffic flows from committed developments (Chapter 5: Traffic and Transport) have been applied and are considered to account for all traffic growth between the base and future years in the study area without the Proposed Development

6.57 2018 baseline conditions assessed are deemed to be appropriate and representative for application site conditions at the commencement of works. This is accounted for in the modelled 'Do Minimum' scenario which take into account the future baseline in 2026.

6.58 It should be noted that over time, the number of petrol/diesel cars are predicted to reduce as a result of initiatives to combat air pollution and so emissions associated with vehicles will reduce over time. This would be as a result of greater numbers of electric vehicles making up the fleet and there being fewer older more polluting vehicles on the road. This change has been calculated using Defra's Emissions Factor Toolkit. The change is shown between the 'Baseline' results and the 'Do Minimum' results. However, as a worst case, the assessment considered that background concentrations will not improve between the baseline year and the assessed future years, and the same background concentrations were utilised.

POTENTIAL IMPACTS

Construction

6.59 Section 5 of "Assessment of Air Quality Impact – Construction Phase" in the AQA Technical Report (Appendix 6.1) details the construction phase assessment techniques, criteria, and results.

6.60 The effects during the construction phase are predicted with regard to the potential for dust nuisance complaints and surface soiling events due to deposition, as opposed to the risk of exceeding any AQOs. All dust impacts are considered to be direct, temporary, short-term and reversible in nature. The impacts are determined to be direct as they occur as a result of activities associated with the Development, temporary as they will only potentially occur during the construction phase, short-term because these will only arise at particular times when certain activities and meteorological conditions for creating the level of magnitude predicted combine, and reversible as conditions will return to baseline upon cessation of construction phase activities.

6.61 The potentially significant effects during the construction phase are predicted with regard to the potential for dust nuisance complaints and surface soiling events due to deposition, as opposed to the risk of exceeding any AQOs. It should be noted that, in accordance with IAQM Guidance[12], the methodology outlined above determines a Risk Factor, rather than an Impact Description, prior to the implementation of mitigation measures. The risk factor for the Construction phase assessment is determined to be "high". The effects of dust associated with the Construction Phase of the proposed development is determined to be "negligible" with the appropriate mitigation in place.

6.62 All dust impacts are considered to be direct, temporary, short-term and reversible in nature. The impacts are determined to be direct as they occur as a result of activities associated with the Development, temporary as they will only potentially occur during the construction phase, short-term because these will only arise at particular times when certain activities and meteorological conditions for creating the level of magnitude predicted combine, and reversible as conditions will return to baseline upon cessation of construction phase activities.

6.63 However, following the implementation of the mitigation measures detailed in the Tables 6.18 and 6.19 in next sections, the effect of the impact during the construction phase are considered to be negligible and not significant.

6.64 Full details of the determination of the significance of effects and risks associated with the construction phase are within Appendix 6.1

Operational

6.65 Additional vehicle movements associated with the Development will generate additional exhaust emissions, such as NO_2, PM_{10} and $PM_{2.5}$, on the local and regional road networks. In order to

quantify potential impacts of these emissions in the vicinity of the Site, a detailed dispersion modelling assessment has been undertaken using the ADMS-Roads software package. This model is routinely used in the UK for environmental assessment work.

6.66 The assessment of likely significant impacts of road vehicle exhaust emissions has been undertaken for the following assessment years:

- Baseline = Existing Site Conditions (2018 conditions);
- 'Do Minimum' 2026 = Baseline + Cumulative Developments; and
- Do Something' 2026 = Baseline + Cumulative Developments + Proposed Development

6.67 The Development opening years were considered with appropriate 'do-minimum' and 'do-something' scenarios.

6.68 Reference should be made to the AQA Technical Reports (Appendix 6.1) for the:

- Detailed Modelling of Operational Phase Road Vehicle Exhaust Emissions – Method Statement;
- Detailed Modelling of Operational Phase Road Vehicle Exhaust Emissions – Detailed Results Tables; and,
- Theoretical assessment assuming reduced improvement in emissions from baseline year to future year.

6.69 The predicted concentration levels of for NO_2, PM_{10} and $PM_{2.5}$ at the selected existing receptors and the proposed receptors in the operational phase of the are precited to be below the relevant AQOs for the protection of human health.

6.70 Receptors that are considered as part of the air quality assessment are primarily those existing receptors that are situated within 200 m of roads predicted to experience significant changes in traffic flow as a result of the Development.

6.71 The sensitivity of receptors is determined by the predicted concentration of pollutant at that receptor in the 'do minimum' scenario, i.e. receptors that already experience high levels of pollutant exposure are highly sensitive and vice versa. A summary of the sensitivity of receptors to road traffic emissions, is presented in table 6.14.

Table 6.13 - Sensitive Receptors

Discrete Sensitive Receptor		**Coordinates**		**Receptor Height (m)**	**Do Minimum 2026 NO_2 ($\mu g/m^3$)**
		X	**Y**		
R1	28 O'Leary Drive	317953	173516	1.5	27.69

Discrete Sensitive Receptor		Coordinates		Receptor Height (m)	Do Minimum 2026 NO_2 ($\mu g/m^3$)
		X	Y		
R2	9 Horle Close	318409	174705	1.5	24.91
R3	233 Corporation Road	318414	174738	1.5	25.64
R4	1 Avondale Way	318339	174715	1.5	21.19
R5	187 Penarth Road	317718	175239	1.5	29.15
R6	189a Penarth Road	317693	175214	1.5	25.74
R7	2 Clive Street	317529	175061	1.5	27.34
R8	10 Ferry Road	317504	175037	1.5	28.28
R9	2 Ferry Road	317793	174363	1.5	22.28
R10	1A Ferry Road	317746	174341	1.5	21.80
R11	Flat 10 Marl Court	317744	174374	1.5	21.33
R12	18 York Place	317707	174356	1.5	22.59
R13	14 Morel Court	317654	174309	1.5	22.71
R14	51 St Marys Street	317914	173622	1.5	23.77
R15	28 O'Leary Drive	318342	176065	1.5	23.24

Table 6.14 Summary of Receptor Sensitivity

Discrete Sensitive Receptor		Sensitivity (Value)
R1	28 O'Leary Drive	Negligible
R2	9 Horle Close	Negligible
R3	233 Corporation Road	Negligible
R4	1 Avondale Way	Negligible
R5	187 Penarth Road	Negligible
R6	189a Penarth Road	Negligible
R7	2 Clive Street	Negligible
R8	10 Ferry Road	Negligible
R9	2 Ferry Road	Negligible
R10	1A Ferry Road	Negligible
R11	Flat 10 Marl Court	Negligible
R12	18 York Place	Negligible
R13	14 Morel Court	Negligible
R14	51 St Marys Street	Negligible
R15	28 O'Leary Drive	Negligible

Nitrogen Dioxide

6.72 The Predicted annual mean NO_2concentrations from traffic generated from the Development were assessed against the AQO of 40 µg/m3. The results are summarised in Table 6.15 but reference

should be made to Appendix 6.1 (see Table 6.7) for detailed results of predicted annual mean NO_2 concentrations at each sensitive receptor assessed.

Table 6.15 - Significance at the Identified Sensitive Receptors (NO_2)

Discrete Sensitive Receptor		NO_2 (µg/m³)					
		Do Minimum 2026	**Do Something 2026**	**Sensitivity**	**Dev Contribution**	**% Change of AQO**	**Significance of Effect**
R1	28 O'Leary Drive	27.69	27.72	Negligible	0.03	0.08	Negligible
R2	9 Horle Close	24.91	24.95	Negligible	0.04	0.10	Negligible
R3	233 Corporation Road	25.64	25.68	Negligible	0.04	0.10	Negligible
R4	1 Avondale Way	21.19	21.23	Negligible	0.04	0.10	Negligible
R5	187 Penarth Road	29.15	29.18	Negligible	0.03	0.08	Negligible
R6	189a Penarth Road	25.74	25.75	Negligible	0.01	0.03	Negligible
R7	2 Clive Street	27.34	27.41	Negligible	0.07	0.18	Negligible
R8	10 Ferry Road	28.28	28.38	Negligible	0.10	0.25	Negligible
R9	2 Ferry Road	22.28	22.49	Negligible	0.21	0.53	Negligible
R10	1A Ferry Road	21.80	21.98	Negligible	0.18	0.45	Negligible
R11	Flat 10 Marl Court	21.33	21.45	Negligible	0.12	0.30	Negligible
R12	18 York Place	22.59	22.74	Negligible	0.15	0.38	Negligible
R13	14 Morel Court	22.71	22.83	Negligible	0.12	0.30	Negligible
R14	51 St Marys Street	23.77	23.84	Negligible	0.07	0.18	Negligible
R15	28 O'Leary Drive	23.24	23.24	Negligible	<0.01	<0.01	Negligible

6.73 The maximum predicted increase in annual average exposure to NO_2 at any existing receptor, due to changes in traffic movements associated with the completed Development, is 0.21 µg/m3 at 10 Ferry Road (R9). Th significance of effects at this receptor is negligible and predicted to be negligible at all sensitive receptors modelled.

6.74 The potential effect of vehicle emissions on NO_2 concentrations is considered negligible at all receptors assessed and so not significant.

Particulate Matter (PM_{10} and $PM_{2.5}$)

6.75 Predicted annual mean ground level PM_{10} and $PM_{2.5}$ concentrations from traffic generated from the Development were assessed against the AQO of 40µg/m3. The results are summarised in Table 6.16 and Table 6.17 respectively, but reference should be made to Appendix 6.1 (see Table 6.9) for detailed results tables of predicted annual mean PM_{10} concentrations.

Table 6.16 - Significance at the Identified Sensitive Receptors (PM_{10})

Discrete Sensitive Receptor		**PM_{10} (µg/m^3)**					
		Do Minimum 2026	**Do Something 2026**	**Sensitivity**	**Dev Contribution**	**% Change of AQO**	**Significance of Effect**
R1	28 O'Leary Drive	16.73	16.74	Negligible	0.01	0.03	Negligible
R2	9 Horle Close	16.09	16.10	Negligible	0.01	0.04	Negligible
R3	233 Corporation Road	16.28	16.29	Negligible	0.01	0.04	Negligible
R4	1 Avondale Way	15.10	15.12	Negligible	0.01	0.03	Negligible
R5	187 Penarth Road	17.81	17.82	Negligible	0.01	0.02	Negligible
R6	189a Penarth Road	16.85	16.85	Negligible	<0.01	0.01	Negligible
R7	2 Clive Street	17.26	17.28	Negligible	0.02	0.05	Negligible
R8	10 Ferry Road	17.51	17.54	Negligible	0.03	0.08	Negligible
R9	2 Ferry Road	15.86	15.92	Negligible	0.06	0.15	Negligible

Discrete Sensitive Receptor		PM_{10} (µg/m³)					
		Do Minimum 2026	Do Something 2026	Sensitivity	Dev Contribution	% Change of AQO	Significance of Effect
R10	1A Ferry Road	15.74	15.79	Negligible	0.05	0.13	Negligible
R11	Flat 10 Marl Court	15.63	15.66	Negligible	0.04	0.09	Negligible
R12	18 York Place	15.95	16.00	Negligible	0.04	0.11	Negligible
R13	14 Morel Court	15.98	16.02	Negligible	0.04	0.10	Negligible
R14	51 St Marys Street	15.65	15.68	Negligible	0.02	0.05	Negligible
R15	28 O'Leary Drive	15.69	15.69	Negligible	<0.01	<0.01	Negligible

6.76 The maximum predicted increase in annual average exposure to PM_{10} at any existing receptor, due to changes in traffic movements associated with the operational phase 0.06 µg/m3 at 10 Ferry Road (R9). The significance of effects at these receptors is negligible.

6.77 The potential effect on annual mean PM_{10} concentration from the Development traffic flows is predicted to be negligible at all existing sensitive receptors that were modelled.

Table 6.17 - Significance at the Identified Sensitive Receptors ($PM_{2.5}$)

Discrete Sensitive Receptor		$PM_{2.5}$ (µg/m³)					
		Do Minimum 2026	Do Something 2026	Sensitivity	Dev Contribution	% Change of AQO	Significance of Effect
R1	28 O'Leary Drive	10.26	10.26	Negligible	0.01	0.02	Negligible
R2	9 Horle Close	10.23	10.24	Negligible	0.01	0.03	Negligible
R3	233 Corporation Road	10.34	10.34	Negligible	0.01	0.03	Negligible
R4	1 Avondale Way	9.67	9.68	Negligible	0.01	0.03	Negligible

Discrete Sensitive Receptor		$PM_{2.5}$ (µg/m^3)					
		Do Minimum 2026	**Do Something 2026**	**Sensitivity**	**Dev Contribution**	**% Change of AQO**	**Significance of Effect**
R5	187 Penarth Road	11.61	11.62	Negligible	0.00	0.01	Negligible
R6	189a Penarth Road	11.07	11.07	Negligible	<0.01	0.01	Negligible
R7	2 Clive Street	11.30	11.31	Negligible	0.01	0.04	Negligible
R8	10 Ferry Road	11.44	11.46	Negligible	0.02	0.07	Negligible
R9	2 Ferry Road	9.95	9.99	Negligible	0.03	0.13	Negligible
R10	1A Ferry Road	9.89	9.91	Negligible	0.03	0.11	Negligible
R11	Flat 10 Marl Court	9.82	9.84	Negligible	0.02	0.08	Negligible
R12	18 York Place	10.00	10.03	Negligible	0.02	0.09	Negligible
R13	14 Morel Court	10.02	10.04	Negligible	0.02	0.08	Negligible
R14	51 St Marys Street	9.66	9.67	Negligible	0.01	0.04	Negligible
R15	28 O'Leary Drive	9.83	9.83	Negligible	<0.01	<0.01	Negligible

6.78 The maximum predicted increase in annual average exposure to $PM_{2.5}$ at any existing receptor, due to changes in traffic movements associated with the operational phase is is 0.03 µg/m3 at 10 Ferry Road (R9) and 2 Ferry Road (R10). The significance of effects at these receptors is negligible.

6.79 The potential effect on annual mean $PM_{2.5}$ concentration from the Development traffic flows is predicted to be negligible at all existing sensitive receptors that were modelled.

MITIGATION AND MONITORING

Construction

6.80 The assessment has determined that the potential impact description of dust emissions associated with the construction phase of the Development is negligible" for demolition, site earthworks, trackout and construction.

6.81 The mitigation measures have been divided into general measures applicable to all construction sites and measures applicable specifically to demolition, earthworks, construction and trackout. They are categorised into 'highly recommended' and 'desirable' measures.

6.82 The following appropriate mitigation measures presented in Tables 6.18 and 6.19 below. These are standard measures that reflect the IAQM guidance[12] and are therefore considered to be embedded into the proposed development, having been applied to the assessment of Potential Effects. Notwithstanding this, the tables below provide further details as to the information that will be provided within the CEMP to ensure that the Potential Effects identified within Section 5.0 are realised.

Table 6.18 - 'Highly Recommended' Construction Phase Mitigation Measures

Communications
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 may be the environment manager/engineer or the site manager.
Display the head or regional office contact information.
Dust Management
Develop and implement a Dust Management Plan (DMP), which may include measures to control other emissions, approved by the Local Authority. The level of detail will depend on the risk, and should include as a minimum the highly recommended measures in this document. The DMP may include monitoring of dust deposition, dust flux, real time PM_{10} continuous monitoring and/or visual inspections.
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.
Make the complaints log available to the local authority when asked.
Record any exceptional incidents that cause dust and/or air emissions, either on- or offsite, and the action taken to resolve the situation in the log book.
Hold regular liaison meetings with other high-risk construction sites within 500m of the site boundary, to ensure plans are co-ordinated and dust and particulate matter emissions are minimised. It is important to understand the interactions of the off-site transport/deliveries which might be using the same strategic road network routes.

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 100m of site boundary, with cleaning to be provided if necessary.
Carry out regular site inspections to monitor compliance with the DMP, record inspection results, and make an inspection log available to the local authority when asked.
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.
Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible.
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 described below.
Cover, seed or fence stockpiles to prevent wind whipping.
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 un-surfaced 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.
Implement a Travel Plan that supports and encourages sustainable travel (public transport, cycling, walking, and car-sharing).
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.
Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate.
Use enclosed chutes and conveyors and covered skips.
Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate.
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.
Avoid bonfires and burning of waste materials.
Demolition

Soft strip inside buildings before demolition (retaining walls and windows in the rest of the building where possible, to provide a screen against dust).
Ensure effective water suppression is used during demolition operations. Hand held sprays are more effective than hoses attached to equipment as the water can be directed to where it is needed. In addition, high volume water suppression systems, manually controlled, can produce fine water droplets that effectively bring the dust particles to the ground.
Avoid explosive blasting, using appropriate manual or mechanical alternatives.
Bag and remove any biological debris or damp down such material before demolition.
Earthworks
Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable.
Use Hessian, mulches or trackifiers 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.
Construction
Avoid scabbling (roughening of concrete surfaces) if possible.
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.
Ensure bulk cement and other fine powder materials are delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overfilling during delivery.
Trackout
Use water-assisted dust sweeper(s) on the access and local roads, to remove, as necessary, any material tracked out of the site. This may require the sweeper being continuously in use.
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.
Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable).
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.
Access gates to be located at least 10m from receptors where possible.

Table 6.19 - 'Desirable' Construction Phase Mitigation Measures

Communications
No Action Required.
Dust Management
No Action Required.

Demolition
No Action Required.
Earthworks
No Action Required.
Construction
For smaller supplies of fine power materials ensure bags are sealed after use and stored appropriately to prevent dust.
Trackout
No Action Required.

Operation

6.83 The Development results in a 'negligible' effect on air quality during the operational phase. Therefore, it is considered that additional mitigation or monitoring measures are not required, the likely residual air quality effect of the completed Development is negligible (not significant) at all the sensitive receptors modelled.

RESIDUAL IMPACTS

Construction

6.84 The construction phase assessment has assessed the potential impact significance of construction activities of earthworks, construction and trackout, and the appropriate mitigation measures to reduce the impact risks have been recommended.

6.85 Following the implementation of the recommended mitigation measures, the risk of adverse effects due to emissions from the construction phase will be negligible.

Operation

6.86 The significance of the effects of changes in traffic flow as a result of the Proposed Development, with respect to NO_2, PM_{10} and $PM_{2.5}$ exposures, is determined to be 'negligible' at all identified receptor locations as shown in table 6.15 – 6.17.

6.87 All future residential receptor locations within the Site are predicted to be below the AQO for NO_2, PM_{10} and $PM_{2.5}$.

6.88 Given the quantitative nature of the assessment and the verification of the air quality dispersion model, the confidence of the assessment is deemed to be 'high'.

SUMMARY AND CONCLUSIONS

6.89 Sections ‘Mitigation and monitoring’ and ‘Residual Impacts’ provides a summary of the findings of the assessment.