

6. Air Quality

6.1 Introduction

- 6.1.1 This chapter provides a preliminary assessment of the emissions of air pollutants to atmosphere and the likely significant effects upon ambient air quality arising from the Moorside Project.
- 6.1.2 The applicable National, Regional and Local planning policies relating to air quality matters are discussed, together with the relevant legislative controls over emissions to atmosphere and the control and management of ambient air quality. Baseline air quality in the areas which may be affected by the Moorside Project is considered and there then follows a discussion of the spatial, temporal and technical scope of the assessment, including the identification of sensitive human and ecological receptors.
- 6.1.3 A preliminary assessment of the likely significant impacts upon ambient air quality of emissions to atmosphere from the Moorside Project, both in terms of its individual elements and as a whole, is provided. This assessment incorporates designed-in mitigation measures and evaluates air quality impacts arising during site preparation, construction and operation of the Moorside Site, the Accommodation Sites, the St. Bees Railway Site, the Corkickle to Mirehouse Railway Site and the sites for the Highway Improvements.
- 6.1.4 The assessment of changes in baseline air quality is also of relevance to other environmental topics, which are described in other sections of the PEIR, notably:
- Terrestrial and Freshwater Ecology (**Chapter 18**); and
 - Radiological Effects (**Chapter 21**).

6.2 Limitations of the PEIR

- 6.2.1 The scale and complexity of the Moorside Project means that it is continuing to evolve at this preliminary stage, which presents limitations in terms of programme and phasing. The limitations of this air quality chapter also arise from the technical uncertainties inherent in the estimation of pollutant emissions to atmosphere and the subsequent mathematical uncertainties of the dispersion modelling techniques that are used to estimate the effects of the Moorside Project upon ambient air quality. If one assumes, logically, that the true output value of an assessment lies in the middle of an “envelope” of results, then the assumptions that are made in compiling the input data for the assessment are, as far as is possible and practicable, directed towards ensuring that the assessment output values lie towards the upper bound of that envelope. Additionally, baseline survey monitoring work is ongoing and therefore there are data yet to be collected which will further inform baseline characterisation. These limitations will have been resolved prior to submission of the Environmental Statement (ES) in 2017.

6.2.2 In addition, the assessment has focussed on the construction and operational phases of each site considered and decommissioning has not been specifically assessed within the PEIR as it remains uncertain at this point which elements would be decommissioned and when. Each of the Accommodation Sites and Additional Sites may see some element of decommissioning activity undertaken once the construction phase of the MPS itself is complete (demolition and/or removal of certain features) and these will be assessed in the ES that will be submitted with the application for a DCO in 2017. It is likely that the air quality effects arising during decommissioning of the Accommodation Sites will be no greater than those experienced during construction. As discussed in Section 2.4 of this document, decommissioning of the MPS itself will also be included within the ES but at a high level, given that these activities will take place around 60 years after operations commence, and they will be covered by a separate EIA of the activities at that time.

6.3 Policy and legislative context

Policy context

6.3.1 The following planning policy and guidance will be used to inform this assessment on air quality:

- Overarching National Policy Statement for Energy (NPS EN-1) (Reference 1. DECC) which sets out national policy for major energy infrastructure delivery.
 - This includes references to emissions to atmosphere and air quality, notably in Section 5.2, which contains recommendations for the content of an Environmental Statement that is submitted with a DCO application. Section 5.6 also deals with the issues of dust and odour impacts arising from Nationally Significant Infrastructure Projects (NSIPs).
- National Policy Statement for Nuclear Power Generation (NPS EN-6) (Reference 2. DECC) which sets out national policy for Nuclear Power infrastructure delivery.
 - This identifies the potential for effects upon air quality to contribute to cumulative impacts upon biodiversity (at paragraph 3.9.2 of NPS EN-6, Volume I) and also states that (paragraph 3.12.3 of NPS EN-6, Volume I):

"The operation of a new nuclear power station is unlikely to be associated with significant noise, vibration or air quality impacts (although there may be local impacts from transport and associated activities during construction; and if cooling towers are required, particularly forced draught towers, the potential noise impact may be greater). With appropriate mitigation, the subsequent effect of these potential impacts on human health is unlikely to be significant".

- National Planning Policy Framework (NPPF) (Reference 3. DCLG) which details planning policies for England and their application.
 - Sections relevant to air quality include paragraphs 109 and 124, which stipulate that planning policies should contribute to and enhance the natural and local environment, and should sustain compliance with and contribute towards the European Union (EU) air quality limit values and national objectives for pollutants. It also highlights the need for development to be compatible with local Air Quality Action Plans. Such plans are applied by local authorities to improve air quality in Air Quality Management Areas, defined in the NPPF as areas designated by local authorities because they are not likely to achieve national air quality objectives by the relevant deadline dates.
- The Air Quality Strategy for England, Scotland, Wales and Northern Ireland (Reference 4. Defra) which specifies air quality objectives and policies and lays out the Government's long-term vision for improving air quality in the UK.
- National Planning Practice Guidance on Air Quality (Reference 5. NPPG) which provides guiding principles on how planning can take account of the impact of new development on air quality. It also contains information on how impacts on air quality can be considered at the planning stage of projects.

6.3.2 The following local planning policies have informed this assessment:

- Cumbria County Council (CCC) Minerals and Waste Development Framework documents 2009 (Reference 6. CCC) which provide guidance for mineral working and waste management development planning applications;
- Copeland Borough Council's Local Plan 2013 - 2028 (Reference 7. CBC) which sets out the council's policies and proposals for planning issues and development proposals;
- Allerdale Borough Council's Local Plan (Part 1) (Reference 8. ABC) which contains the Council's planning policies for the use and development of land up to 2029; and
- Lake District National Park Policy CS11 for Sustainable Development Principles (Reference 32. LDNP).

Legislative context

6.3.3 Legislation relevant to the issue of air quality is as follows:

- Directive 2008/50/EC on Ambient Air Quality and Cleaner Air for Europe (Reference 9. European Parliament);
- The Air Quality Standards Regulations 2010 (Reference 10. UK Government);
- Part IV of the Environment Act 1995 (Reference 11. UK Government);

- The Environmental Protection Act 1990 (Reference 12. UK Government); and
- The Environmental Permitting Regulations 2010 (Reference 13. UK Government).

Technical guidance

6.3.4 Applicable technical guidance includes:

- The Local Air Quality Management Technical Guidance (LAQM TG (09))¹ which provides technical guidance on local air quality management (Reference 14. Defra);
- The Environment Agency's (EA) Risk Assessment Methodology which provides a framework for achieving compliance with Environmental Permits for those processes covered by the Environmental Permitting Regulations (Reference 15. EA);
- How to comply with your environmental permit. Additional guidance for: Combustion Activities (EPR 1.01) sets out measures and benchmarks for installations operating under a Combustion Activity Permit (Reference 16. EA);
- Land-Use Planning & Development Control: Planning For Air Quality which provides planning guidance that ensures air quality is properly considered in the development control process (Reference 17. EPUK/IAQM);
- Guidance on the assessment of dust from demolition and construction which provides information on how to undertake a construction impact assessment (Reference 18. IAQM);
- Technical Guidance to the National Planning Policy Guidance which addresses the nuisance and health impacts of dust (Reference 19. DCLG);
- Guidance from the Atmospheric Dispersion modelling Liaison Committee on the minimum technical requirements for carrying out air dispersion modelling and reporting the results thereof (Reference 20. ADMLC); and
- The Highways Agency's Design Manual for Roads and Bridges (DMRB), Volume 11, Section 3 Part 1: Air Quality, which contains guidance on the assessment of the air quality effects arising from road schemes (Reference 21. Highways Agency).

6.4 Data gathering methodology

Study area

6.4.1 The study area for the air quality effects assessment has been defined by the extent of the likely significant effects arising from the range of different

¹ Defra is currently undertaking a review of Local Air Quality Management (LAQM) in the UK and is due to publish up-to-date guidance this year. For the time being, LAQM TG (09) is applicable. https://consult.defra.gov.uk/communications/laqm_changes/consult_view

activities that will have an influence on air quality throughout the lifetime of the Moorside Project and through consultation with relevant consultees (see paragraph 6.4.19 *et seq.*). Taking into account the areas surrounding the Moorside Project Sites, a summary of the factors that have been considered to define relevant study areas is provided in the following sections.

Moorside Site

- 6.4.2 The general study area immediately around the Moorside Site is shown on **Figure 6.1**, together with 2 km, 5 km and 10 km radii measured from the boundary of the Moorside Site. The final study area is in the process of being fully defined, as some of the factors that will influence this are still being determined. These factors that may influence air quality within the Moorside Site study area are identified below.
- 6.4.3 Emissions from standby combustion plant on the Moorside Site (see **Section 2.2** of this document) in the operation phase would potentially exert air quality effects on human receptor locations up to 5 km from the Moorside Site, for ecological receptors designated at a European level, up to 10 km from the Moorside Site and for ecological receptors designated at a national and local level, up to 2 km from the Moorside Site.
- 6.4.4 Similarly, exhaust emissions from plant and machinery undertaking site preparation and clearance, excavations, land forming and construction activities have the potential to affect human receptors up to 5 km from the Moorside Site and ecological receptors up to 10 km from the Moorside Site. This will also include emissions from ship movements to and from the marine off-loading facility (MOLF).
- 6.4.5 The Department of the Environment (DoE) Dust Study (Reference 22. DoE) concluded that complaints relating to dust deposition were most likely within 175 m of a source but, for sites with significant dust sources and unfavourable meteorological conditions, the distance could be up to 500 m. In this assessment a sensitive receptor is considered to be at greatest risk from dust if located in close proximity (<200 m) to the source and if the prevailing wind is coming from the direction of the dust source at a sufficient wind strength.
- 6.4.6 Emissions from road traffic associated with the site preparation and clearance, construction and operation of the Moorside Project have the potential to affect human and ecological receptors at up to 200 m from the centrelines of roads that experience changes in traffic flows over and above certain thresholds variously defined by the Highways England Design Manual for Roads and Bridges (Reference 21. Highways Agency), the Institute of Environmental Management & Assessment (Reference 23. IEMA) and IAQM (Reference 17. IAQM). The most stringent thresholds are contained in the EPUK/IAQM guidance and these specify that an air quality assessment is required if the following criteria are fulfilled:
- The development results in a change of light duty vehicle (cars and vans less than 3.5 tonnes in weight) flows of more than 100 AADT within or

adjacent to an Air Quality Management Area (AQMA)², or more than 500 AADT elsewhere, where AADT is the annual average daily traffic flow; and

- The development results in a change of heavy duty vehicle and/or bus flows of more than 25 AADT within or adjacent to an AQMA boundary, or more than 100 AADT elsewhere.

6.4.7 It is worth noting that there are currently no AQMAs in the Copeland or Allerdale Boroughs.

6.4.8 Rail freight and passenger movements along the Cumbrian Coast rail line between the Port of Workington and the Moorside Site, and Barrow-in-Furness and the Moorside Site have the potential to affect human and ecological receptors close to the rail corridor, as a result of dust and diesel exhaust emissions. Guidance in LAQM.TG (09) (Reference 14. Defra) suggests that locations with regular outdoor exposure within 15 m of stationary diesel-powered locomotives, and long-term exposure within 30 m of the rail line should be considered in an assessment.

Accommodation Sites and Additional Sites

6.4.9 For the sites where worker accommodation is planned, i.e. the Corkickle Site, the Mirehouse Site and the Egremont Site, the study areas in the vicinity of these are defined by the nature and level of activities that will be taking place on these sites, in terms of construction and operation.

6.4.10 During construction, it is likely that the primary influencing factors will comprise fugitive dust emissions, construction plant emissions and emissions from construction-related road traffic. During the operational phase, emissions from road traffic will be the principal influence on the study areas, together with emissions from increased rail traffic movements at the St. Bees Railway Site and the Corkickle to Mirehouse Railway Site. Given the separation distance between the MOLF and the Accommodation Sites, shipping emissions will have only a negligible effect on air quality. Therefore, study areas are based on the information presented in paragraphs 6.4.5 to 6.4.7 above and can be seen in **Figure 6.2**.

Sites required for the Highway Improvements

6.4.11 Study areas for each of the sites for the potential Highway Improvements are being assessed in accordance with the guidance stipulated in paragraph 6.4.6, as appropriate, as well as using further criteria set out in the EPUK/IAQM guidance (Reference 17. EPUK/IAQM) as follows:

- For the realignment of roads, where the proximity of receptors to traffic flows may be altered, an air quality assessment should be carried out if the change is more than 5 m or more and the road is within an AQMA; and
- Where the introduction or removal of a junction near to relevant receptors takes place, the air quality should be assessed if the development causes

² An AQMA is an area identified by the local authority which is not expected to achieve its air quality objectives.

traffic to significantly change vehicle acceleration/deceleration, including the introduction of traffic lights or roundabouts.

- 6.4.12 There are currently no AQMAs in the areas where the Highway Improvements are located.

Desk study

- 6.4.13 Existing background data on air quality in the study areas were obtained from the following sources:
- Monitoring carried out by Copeland and Allerdale Borough Councils (CBC, ABC) in the course of discharging their statutory Local Air Quality Management duties. Monitoring data from CBC has been received directly;
 - Monitoring data for four locations around the Sellafield Site, carried out by Sellafield Limited (Reference 24. Sellafield Ltd);
 - Background air quality data from the Defra National Background Air Quality Mapping service (Reference 25. Defra); and
 - Meteorological data obtained from the UK Meteorological Office (Met Office) comprising 10 years of NWP data and 10 years of St. Bees Head No.2 data. Additionally, data from the meteorological mast at Sellafield (from Sellafield Limited) has been converted into a suitable format by the Met Office. This will also be used in the baseline characterisation.

Survey work

- 6.4.14 In order to supplement the data acquired through the desk studies (see paragraph 6.4.13 above), air quality monitoring sites were established to characterise more completely baseline air quality around the Moorside Site, the Accommodation Sites, the St. Bees Railway Site, the Corkickle to Mirehouse Railway Site, roadside locations adjacent to and between the Moorside Project Sites and the potential sites for the Highway Improvements. In total, 29 monitoring sites are currently operational, which comprise several sites that were commissioned in 2015, as well as a number of new sites commissioned at the end of January and March 2016.
- 6.4.15 Measurements commenced in March 2015 at 11 sites, with more locations added over the period to December 2015. By the end of March 2016, a number of these locations had recorded at least six months' worth of data. As this was the monitoring duration initially agreed with residents housing the equipment, 8 sites have been decommissioned. Simultaneously, 7 sites have been newly commissioned, which account for the proposed Highway Improvements and an additional location at the Corkickle to Mirehouse Railway Site.
- 6.4.16 The monitoring programme has been informed by discussions that have taken place with consultees (see paragraph 6.4.19 *et seq.*), and the on-going evolution of the design of the Moorside Project. Information on the monitoring stations agreed with consultees, including locations and air pollutants measured, is presented in **Table 6.1**. Here, the monitoring sites have been

categorised as “Moorside Site”, “Accommodation Sites”, “Roadside Sites” and “Raiside Sites”.

6.4.17 The monitoring is being carried out in accordance with the ‘UK National Diffusion Tube Calendar’ (Reference 26. Defra), ‘The Frisbee Dust Gauge Deployment Protocol’ (Reference 27. Stockholm Environment Institute at York) and the recommendations contained in Defra’s LAQM TG(09) Technical Guidance, Chapter 3 (Reference 14. Defra). For example, LAQM TG(09) states that a minimum period of 3 months data should always be used for assessment - following the 2016 monitoring survey for Moorside, all sites identified in **Table 6.1** will have collected at least six months’ worth of data, with 22 sites having collected a full 12 months of data by early 2016. The locations of the monitoring sites are shown in **Figure 6.3**. Data will continue to be collected at these sites until September 2016.

Table 6.1 Current baseline air quality monitoring sites until September 2016

Site No.	Name	Description	Monitored Parameters
Moorside Site			
15	Beckermest	Sellafield Road	NO ₂ , PM, SO ₂
17	The Spinney	Residential property close to the Sellafield Site	NO ₂ , deposited dust, SO ₂
20	Silver Tarn, Hollas & Harnsey Mosses SSSI	Braystones to Nethertown road	NO ₂
21	Low Church Moss SSSI	On Moorside Site	NO ₂ , deposited dust, SO ₂
Accommodation Sites			
11	Mirehouse Site	On Mirehouse Site	NO ₂ , deposited dust
12	Corkickle Site	Residential property close to Corkickle Site	NO ₂ , deposited dust
30	Egremont Site	Residential property close to Egremont Site	NO ₂ , deposited dust
Roadside Sites			
1	Central Whitehaven	Roadside on A595	NO ₂
2	Mirehouse roadside	Roadside on A595	NO ₂
3	Egremont roadside	Roadside on A595	NO ₂
4	Calder Bridge Stanley Arms	Roadside on A595	NO ₂
6	Distington	Roadside on A595	NO ₂
9	Cleator Moor roadside	Roadside on A5086	NO ₂

Site No.	Name	Description	Monitored Parameters
14	Blackbeck	Roadside on A595	NO ₂
16	Calder Bridge	Roadside on A595	NO ₂
18	Cleator	Roadside on A5086	NO ₂
19	Thornhill residential	Roadside on High Road	NO ₂
22	Thornhill	Roadside on A595	NO ₂ , PM
29	Whitehaven NOx Box	Roadside on A595	NOx, NO, NO ₂
Railside Sites			
13	Braystones	Residential property next to rail line through Braystones	NO ₂ , deposited dust
24	Corkickle to Mirehouse Railway Site	On Corkickle Site adjacent to railway line	NO ₂ , deposited dust
25	St. Bees Railways Site	Residential property near to St. Bees station	NO ₂ , deposited dust
31	Corkickle to Mirehouse Railway Site	On Mirehouse Site adjacent to railway line	NO ₂ , deposited dust
Highway Improvements			
32	A66 Hall Brow Widening	Roadside on A66	NO ₂
33	A66 Ramsay Brow	Roadside on A66	NO ₂
34	A595 Parton Junction	Roadside on A595	NO ₂
35	Coach Road/Station Road	Roadside on Coach Road	NO ₂
36	Coach Road/B5435 Junction	Roadside on Coach Road	NO ₂
37	A595/B5295 Homewood Road	Roadside on A595	NO ₂

Note: With regard to Highway Improvements, monitoring is being carried out at locations that do not already have sufficient monitoring in place, and for which the scope of work and proximity of receptors warrant the need for monitoring.

- 6.4.18 As discussed in paragraph 6.4.15, some monitoring sites were removed in March 2016 as sufficient data from these sites was available and the fixed monitoring periods had been agreed with the residents hosting this equipment in their gardens. These sites are listed in **Table 6.2**.

Table 6.2 Decommissioned baseline air quality monitoring sites

Site No.	Name	Monitored parameters	Data to be used in assessment?
5	Winscales	NO ₂	No - no longer required
7	Millom roadside	NO ₂	No - no longer required
8	Millom	NO ₂	No - no longer required
10	Cleator Moor	NO ₂ , deposited dust	No - no longer required
23	Harrington	NO ₂ , deposited dust	Yes - to characterise baseline air quality along the railway line
26	Seascale	NO ₂ , deposited dust	Yes - to characterise baseline air quality along the railway line
27	Bootle	NO ₂ , deposited dust	Yes - to characterise baseline air quality along the railway line
28	Millom, The Green	NO ₂ , deposited dust	Yes - to characterise baseline air quality along the railway line

Consultation

6.4.19 Further to the details outlined in **Chapter 3**, regarding the consultation that has taken place to date, it should be noted that consultation responses received from the following organisations have been used to inform and further develop the scope of the assessment.

- Environment Agency;
- Natural England;
- Copeland Borough Council (Arup);
- Allerdale Borough Council;
- Sellafield Limited;
- Kier Highways (formerly EM Highways); and
- Cumbria County Council.

6.4.20 The comments received and NuGen’s responses are summarised in **Table 6.3** below. The consultations include those on the Scoping Report and feedback from Consultees received in response to the quarterly reporting and meetings cycle.

Table 6.3 Consultation comments received and responses

Themes of Issues raised	Response
<p>Spatial coverage of baseline monitoring agreed. Nitrogen dioxide, rather than nitrogen oxides, monitoring on SSSIs queried, together with lack of baseline monitoring for sulphur dioxide and carbon monoxide.</p>	<p>Nitrogen oxides levels will be calculated by applying factors from the Defra background map data. Sulphur dioxide monitoring has been added to the programme at 3 background locations but carbon monoxide has been scoped-out of consideration as a result of its low background concentrations in the Moorside Project Site study areas in relation to the air quality standard and low levels of emissions from likely project sources.</p>
<p>Query regarding the selection of assessment threshold criteria for the evaluation of road traffic-related air quality impacts.</p>	<p>It has been agreed that the EPUK/IAQM-recommended screening criteria (Reference 17. EPUK/IAQM) will be used, as this puts forward the most stringent criteria.</p>
<p>Concerns that due regard should be paid to assessing the impacts of emissions upon nitrogen and acid deposition on sensitive ecological sites and HRA.</p>	<p>The procedure recommended by Natural England and the Environment Agency (Reference 31. NE/EA) is being applied in the air quality assessment of deposition at European and national/Local designated sites of ecological interest.</p>
<p>There should be links to the Health Impact Assessment (HIA) from the air quality impact assessment.</p>	<p>The outputs from the air quality impact assessment, in terms of changes in the ambient concentrations of air pollutants caused by the Moorside project that could affect public health, are being shared with the HIA team.</p>
<p>Collection of baseline information on fine particulate matter (PM₁₀ and PM_{2.5}) should be implemented.</p>	<p>Continuous monitoring for fine particulate matter was commenced at a roadside location on the A595(T) in July 2015 and at a background location in Beckermeth in November 2015.</p>
<p>Quarterly reporting & consultation</p>	
<p>Concerns expressed that spatial coverage of baseline monitoring locations should be extended to cover the Accommodation sites, Additional Sites and sites along the Cumbrian Coast railway, which could be used to transport materials from the Port of Workington and from Barrow in Furness.</p>	<p>The initial network of 8 monitoring locations has been expanded to a total of 31 locations, which covers places close to the Moorside Site, roadside sites along the major road network, places close to and on the Accommodation Sites and residential properties alongside the Cumbrian Coast railway.</p>

Themes of Issues raised	Response
Concern that at least 6 months of baseline air quality data should be collected at the agreed locations.	It has been confirmed that this body of data will be collected and, at a large number of locations, by the end of March 2016, 12 months of data would be secured.
Several occurrences of unexplained elevated concentrations of fine particulate matter at the two monitoring locations in Thornhill and Beckermest had been identified in the Q3 report.	A subsequent “back-trajectory” analysis has identified that these were due to external sources, arising from “Saharan Dust” episodes and secondary pollutant formation of emissions from eastern European sources.
Concerns over the correct identification of baseline nitrogen and acid deposition rates for habitats and features within sensitive ecological sites and also the correct determination of Lower Critical Load Limits for the sites.	A co-operative approach between Natural England and NuGen has been agreed and is being progressed.
Baseline air quality monitoring will be required to facilitate assessments of the effects of the widening at Ramsey Brow and Hall Brow in Workington.	Baseline monitoring was commenced in late March 2016 at these locations.
Concerns expressed that the Zone of Influence for Natura 2000 sites is set at 10 km and that for other sites at 2 km, and there will be other sites between the 2 km and 10 km Zols that will require assessment under the CROW Act.	The Zols were selected on the basis of guidance provided by the Environment Agency in respect of Environmental Permitting of standby combustion plant. We will identify other sites between 2 km and 10 km and discuss with Natural England.
The decision to use site relevant environmental benchmarks (critical loads/levels) is agreed and the use of the Air Pollution Information System (APIS) as has been outlined in the air quality assessment methodology is also agreed. In order to comment further on whether the conclusions capture residuals in a way that is sufficiently protective of designated site features, we will need more information about sensitivity of receptor and magnitude of change.	There is ongoing dialogue with Natural England on this aspect of the assessment methodology.

Themes of Issues raised	Response
The use of EPUK / IAQM guidance to determine the air quality impacts of NOX and SO ₂ concentrations on ecological receptors is not appropriate as this guidance is designed for use in the assessment of human receptors.	It is not proposed to use this guidance to assess effects upon Critical Levels of these air pollutants. Table has been amended in May PEIR.
Concerns expressed over: the Sellafield meteorological monitoring mast will need to be re-located, the potential effects of dust upon Sellafield Limited's air quality monitoring equipment; effects of dust upon building filtration equipment and effects upon Sellafield work force.	Sellafield receptors have been identified in the preliminary assessment of effects tables in the PEIR and further consultation is to be held with Sellafield Limited to identify sensitive locations, processes and people.

6.5 Scope of the assessment

Potential receptors

Human receptors

6.5.1 In general, human receptors to be considered in the assessment include residential properties and other buildings and locations where people may be present; for example, schools, hospitals, care homes and community facilities, over the averaging periods for air pollutants stipulated by The Air Quality Standards Regulations 2010. Potential receptors specific to each of the sites are identified in the following sections.

Moorside Site

6.5.2 Human receptors that have been included in the assessment of air quality effects within a 5 km distance of the Moorside Site are as follows:

- Residential properties and other buildings and locations that are situated in the town of Egremont, the villages of Beckermeth, Braystones, Nethertown, Thornhill, Calder Bridge, New Mill, Gosforth and Seascale, together with several hamlets and scattered isolated receptors across the 5 km study area. These are identified in **Figure 6.4**.
- Properties within 200 m of the centrelines of roads that will potentially experience changes in traffic flows above certain stipulated thresholds as a result of additional vehicle movements associated with the construction and operation of the Moorside Project, including the A595(T), the A5068 and other main routes. These will be identified and detailed once traffic flow data are available and will be reported in the ES in 2017; and
- Properties alongside the Cumbrian Coast rail line between the Port of Workington in the north and Barrow-in-Furness in the south, which may experience effects as a result of increases in rail freight movements of materials and personnel to and from the Moorside Site. These include the town of Workington and its suburb Harrington; Whitehaven; the villages of St. Bees; Nethertown; Braystones; Seascale; Drigg; Ravenglass; Bootle and Silecroft, together with the towns of Millom; Foxfield; Kirkby-in-Furness; Askam-in-Furness and Barrow-in-Furness. There are also isolated properties and small groups of properties along the length of this rail line.

Accommodation Sites

6.5.3 Human receptors for each of the Accommodation Sites have been considered on a case by case basis and are specified in the following sections.

Corkickle Site

6.5.4 The human receptors to be considered are shown in **Figure 6.5** and include:

- Residential properties to the north and west of the site, including those on Coach Road, Station Road, Esk Avenue, Calder Avenue and Snebro Road;
- St Begh's Church and Catholic Junior School on Coach Road;
- St Gregory and St Patrick's Catholic Community School on Esk Avenue; and
- Residential receptors to the west of the site in Monkway Brow and Monkway Junior School.

Mirehouse Site

6.5.5 The human receptors to be considered are shown in **Figure 6.6** and include:

- Residential properties to the north of the site, including those on Mirehouse Road, Meadow Road and Rutland Avenue;
- West Cumberland Hospital to the north of the site; and
- Other isolated properties including The Cottage, Low Hall Farm, Sunny Brow, Cardewlee and High Low Hall Farm.

Egremont Site

6.5.6 The human receptors to be considered are shown in **Figure 6.7** and include:

- Properties to the north of the site including Scurgill Terrace, New House and properties on Vale View; and
- Residential properties to the south of the site including those on Dent Road, Wodow Road and Thorny Road.

Additional Sites

Corkickle to Mirehouse Railway Site

6.5.7 The human receptors to be considered are shown in **Figure 6.8** and include:

- Residential properties along the rail line, including those on Whinlatter Road, Grisedale Close, Wasdale Close and Croasdale Avenue as well as some of those receptors identified in paragraph 6.5.3; and
- Valley Primary School and Nursery.

St. Bees Railway Site

6.5.8 The human receptors to be considered are shown in **Figure 6.9** and include:

- Properties on both sides of the railway line by St. Bees station, including those on Station Road; and
- Residential properties on Seacroft Drive and Beckside.

Sites for the Highway Improvements

6.5.9 A total of ten locations have been taken forward for Highway Improvements. **Figures 6.10 to 6.13** detail these locations and relevant receptors are identified in **Table 6.4**.

Table 6.4 Potential human receptors for the Highway Improvements

Scheme	Closest Receptors
A66 Ramsey Brow Improvement	Residential properties on the south side of the A66 at the back-end of the kerb and along the western edge of A596.
A596 Hall Brow Improvement	Residential properties along the west side of the A596
A66/A595 Roundabout Improvement	No receptors nearby.
A595 Parton Junctions Improvement	Residential receptors immediately to the west of the A595 in Seven Acres and Briscoe Crescent.
Coach Road/Station Road Improvement	Residential receptors on Coach Road and Station Road.
Coach Road/B5435 Improvement	Residential properties in Ellison Place, immediately to the north.
A595/A5094 Inkerman Terrace/B5295 Ribton Moorside Improvement	Residential properties on the A595, the A5094 and Hensingham Road.
A595/B5295 Homewood Road Roundabout Improvement	Receptors in Suffolk Close to the east.
A595/Moor Row Improvement	Receptors on the A595 including Scalegill Hall and Beech House.
A595/The Crescent Thornhill Improvement	Receptors on High Road.

Ecological receptors

6.5.10 Ecological receptors include those locations which are designated protected habitats, including Special Protection Areas (SPA), Special Areas for Conservation (SAC), Ramsar Sites, Sites of Special Scientific Interest (SSSI), Local Nature Reserves (LNR) and County Wildlife Sites (CWS). Potential receptors for the Moorside Project are identified in the following sections.

Moorside Site

6.5.11 The ecological receptors to be assessed for the Moorside Site are presented in **Figures 6.14 and 6.15** and in **Table 6.5**. Please refer to **Chapter 18, Table**

18.4 for more information on site designations. The distance criteria for the assessment of 10 km and 2 km was discussed and agreed with the Environment Agency at a meeting for the Moorside Project in November 2015.

Table 6.5 Ecological receptors considered for the Moorside Site

	Receptor Name	Designation*
Assessed within 10 km of Moorside Site Boundary	River Ehen Lake District High Fells Drigg Coast Morecambe Bay Duddon Estuary	SAC SAC SPA/SAC SPA
Assessed within 2 km of Moorside Site Boundary	Silver Tarn, Hollas and Harnsey Mosses Braystones Coast Low Church Moss Sellafield Disused Railway Line Braystones River Ehen Sellafield Tarn Terrace Bank Wood Calder Bank Wood Priorling Wood Robertgate and High Woods Nursery Wood Haile Great Wood	SSSI CWS SSSI CWS CWS CWS CWS CWS AW AW AW AW SSSI

*SAC = Special Area of Conservation, SPA = Special Protection Area, SSSI = Site of Special Scientific Interest, CWS = County Wildlife Site, AW = Ancient Woodland.

Accommodation Sites

6.5.12 Ecological receptors considered in the assessment for Accommodation Sites other than the Moorside Site comprise all of the above categories of protected sites which are within 500 m of the site boundary. There are few, if any, ecological receptors within these criteria at each of the Accommodation Sites, but those identified are included in **Table 6.6**.

Table 6.6 Potential ecological receptors considered for the Accommodation Sites

Site Name	Receptor Name	Designation*
Corkickle Site	Midgey Wood Crowpark Wood Castle Park Wood Woodhouse Quarry	AW/CWS AW CWS CWS
Mirehouse Site	Bellhouse Gill Wood Benhow Wood Stanley Pond	AW CWS CWS
Egremont Site	Oxenriggs Pond	CWS

Note: Ecological receptors identified up to 500 m for the site boundary. CWS = County Wildlife Site, AW = Ancient Woodland.

St. Bees Railway Site

- 6.5.13 There are no potential ecological receptors for consideration within 500 m of the St. Bees Railway Site boundary³.

Corkickle to Mirehouse Railway Site

- 6.5.14 Those potential ecological receptors considered for the Corkickle to Mirehouse Railway Site comprise those detailed for the Corkickle Site and the Mirehouse Site.

Spatial and temporal scope

- 6.5.15 The geographical extents of the assessment have been defined above in **Sections 6.4** and **6.5** above and in **Figures 6.1** and **6.2**.
- 6.5.16 The timescale over which the assessment is being undertaken for the Moorside Site starts with the baseline air quality in 2015 and 2016, includes the site preparation and clearance works from 2019; the construction work over the period 2021 to 2026; with the Moorside Power Station becoming deployable in 2025 (unit 1). The forecast operational lifetime of the MPS is a circa 60-year horizon, with decommissioning anticipated to take place at some point after 2085.
- 6.5.17 The baseline air quality monitoring for the Accommodation Sites, as well as the Corkickle to Mirehouse Railway site and the St. Bees Railway site, began in 2015 and continues into 2016.
- 6.5.18 It should be noted that air quality is expected to continue to improve into the future, as a result of continuing UK and EU pollution control initiatives. That is to say, baseline air pollutant concentrations are expected to decrease year on year and, therefore, an assessment of baseline air quality made in 2016 is expected to result in higher pollutant concentrations when compared with an assessment made in, say, 2019. As a result, the air quality effects of the Moorside Project during the operational phase will not be assessed beyond 2026, when all three AP1000© reactors will be generating electricity, since baseline air quality will have improved. This will provide a worst-case assessment, in terms of background air quality levels.
- 6.5.19 As the timescales for the construction and decommissioning phases cover a shorter time period, these phases will be considered separately and will be assessed over the entire time series of the construction period.

Potentially significant effects

- 6.5.20 During the site clearance and construction phases of the Moorside Project, those human and ecological receptors closest to the Moorside Site boundary and the Accommodation Sites boundaries are likely to experience the greatest magnitude of change in air quality and Potentially Significant effects.

³ Although St Bees Head is located in close proximity, it is designated for its geological importance.

- 6.5.21 The sources of these air quality effects on the Moorside Site will be exhaust emissions from non-road mobile machinery (NRMM), marine vessels and fugitive dust emissions from earthmoving and construction operations. Also, during operation of the Moorside Power Station, human receptors within 5 km and ecological receptors within 2 km and 10 km, the latter depending on receptor designation, of the Moorside Site could experience air quality effects from occasional running of up to six standby diesel generators.
- 6.5.22 With regard to the Accommodation Sites, the Corkickle to Mirehouse Railway Site and the St. Bees Railway Site, the main sources of emissions include fugitive dust emissions from earthmoving, construction activities and decommissioning, and emissions from road and rail vehicles during operation.
- 6.5.23 The scale and longevity of construction work required for the Highway Improvements are minor and potential effects are likely to be Not Significant.

6.6 Environmental measures incorporated into the proposed development

- 6.6.1 Specific measures relating to this environmental topic and how these have been targeted to particular receptors which are sensitive to changes in air quality at and around the Moorside Project Sites, are set out in **Table 6.7**. As the air quality mitigation measures that can be applied to reduce effects at receptors are all generic in nature, and are not site or receptor-specific, individual Moorside Project Sites are not considered separately in **Table 6.7**, so as to avoid unnecessary repetition.

Table 6.7 Rationale for incorporation of environmental measures

Potential receptor	Predicted changes and potential effects	Incorporated measure
Common to all sites		
Residential properties, schools, care homes, healthcare facilities and other locations		
Where people may be exposed to changes in air quality	Fugitive dust soiling of surfaces arising from earthworks and other construction activities during dry periods of weather.	Application of dust suppression and control techniques and good site management practices to minimise the generation of fugitive dust emissions. This and other environmental measures will be set out in an outline Construction Environmental Management Plan (CEMP). The CEMP will be secured via a requirement in the DCO for the Moorside Project and will accompany the ES in 2017.

Potential receptor	Predicted changes and potential effects	Incorporated measure
	Changes in air quality caused by exhaust emissions to atmosphere from non-road mobile machinery (NRMM) during earthworks and construction activity.	Use of ultra-low sulphur diesel (ULSD) fuels (secured through the CEMP referred to above) and low emission vehicles and plant which incorporate the most stringent exhaust emission controls ⁴ .
	Changes in air quality caused by exhaust emissions to atmosphere from changes in road traffic flows on the local and regional road networks and rail movements on the Cumbrian Coast railway during earthworks and construction activity.	Implementation of measures (set out within the CEMP) to minimise increases in road traffic movements during the earthworks and construction activities. The CEMP will be secured via a requirement in the DCO for the Moorside Project and will accompany the ES in 2017.
	Changes in air quality caused by exhaust emissions to atmosphere from fixed combustion plant and changes in rail and road traffic flows on the local and regional road networks as a result of operation of all the sites.	Implementation of measures to abate fixed combustion plant emissions and minimise increases in road traffic movements during operation of the sites by maximising the use of public transport.
Protected ecological sites, including those with International, European, National and Local status		
Which are sensitive to dust soiling and to exhaust emissions of nitrogen and sulphur oxides	Fugitive dust soiling of plant and ground surfaces arising from earthworks and other construction activities during dry periods of weather.	Application of dust suppression and control techniques and good site management practices to minimise generation of fugitive dust emissions, as set out in the CEMP referred to above. The CEMP will be secured via a requirement in the DCO for the Moorside Project and will accompany the ES in 2017.
	Changes in air quality caused by exhaust emissions to atmosphere from non-road mobile machinery (NRMM) during earthworks and construction activity.	Use of ultra-low sulphur diesel (ULSD) fuels (secured through the CEMP referred to above) and low emission vehicles and plant which incorporate the most stringent exhaust emission controls ¹ .
	Changes in air quality caused by exhaust emissions to atmosphere from changes in road traffic flows on the local and regional road networks and rail movements on the Cumbrian Coast railway during earthworks and construction activity.	Implementation of measures (via the outline CEMP referred to above) to minimise increases in road traffic movements during the earthworks and construction activities. The CEMP will be secured via a requirement in the DCO for the

⁴ Stage IV of the "Non-Road Mobile Machinery (Emission of Gaseous and Particulate Pollutants) Regulations 1999" (Statutory Instrument No. 1999/1053) and subsequent amendments. The Regulations apply to new engines to be installed in non-road mobile machinery, intended and suited to move, or to be moved on the ground, either on or off the road.
<http://www.dft.gov.uk/vca/enforcement/non-road-mobile-mach.asp>

Potential receptor	Predicted changes and potential effects	Incorporated measure
		Moorside Project and will accompany the ES in 2017.
	Changes in air quality caused by exhaust emissions to atmosphere from fixed combustion plant and changes in rail and road traffic flows on the local and regional road networks as a result of operation of all the sites.	Implementation of measures to abate fixed combustion plant emissions and minimise increases in road traffic movements during operation of the sites by maximising the use of public transport.

6.7 Assessment methodology

Methodology for prediction of effects

Air quality objectives, standards and assessment criteria

6.7.1 Air quality objectives and standards are set by the UK government (Reference 4. Defra), ‘Limit Values’ are set by the European Union (EU) (Reference 9. European Parliament) and assessment criteria have been adopted by the UK Environment Agency (Reference 15. EA). Information on Critical Load Limits for a range of sensitive habitats will also be applicable and considered in the assessment (References 28, 29. APIS, IAQM).

Receptor sensitivity

6.7.2 A summary of the assessment methodology is given in **Table 6.8** below. In terms of air quality receptors (that is, the human population and ecological sites), there is no differentiation of sensitivity. If receptors are present in an area that is subject to a change in ambient air quality as a result of a development that introduces new emission sources of air pollutants, then they are considered to be sensitive.

6.7.3 The very young, the infirm (particularly those suffering from cardio-respiratory ailments) and the elderly are generally more sensitive to air pollution than other people but this sensitivity is taken account of in the setting of Air Quality Objectives (AQO) and Air Quality Standards (AQS).

6.7.4 In relation to the categories of human receptors, it may be argued that residential properties, where people are judged to spend a lot of their time, are more air quality sensitive than, for example, offices, factories and recreational facilities (sports centres and pitches, footpaths). However, when taking short term (15 minutes, 1 hour and 8 hours) air quality standards into account, which would apply at places where people only spend short periods of time, these locations are equally as sensitive.

6.7.5 At an EU level, the 2008 Ambient Air Quality Directive (Reference 9. EU) establishes legally binding limits for concentrations of pollutants such as

particulate matter and nitrogen dioxide, upon which the Air Quality Standards Regulations 2010 (Reference 10. UK Government) have been based. These limit values apply to a number of receptor locations, as discussed in paragraph 6.7.4 above. However, the Air Quality Standards Regulations (see Part 1 of Schedule 1) also define locations where ambient air quality does not have to be assessed, as follows:

“Compliance with limit values directed at the protection of human health does not need to be assessed at the following locations—

(a) any location situated within areas where members of the public do not have access and there is no fixed habitation;

(b) on factory premises or at industrial locations to which all relevant provisions concerning health and safety at work apply;

(c) on the carriageway of roads and on the central reservations of roads except where there is normally pedestrian access to the central reservation.”

6.7.6 The UK government’s technical guidance document on air quality for local air quality management (LAQM TG) (Reference 14. Defra) advises (at paragraph 1.29):

“It is particularly important that Review and Assessments focus on those locations where members of the public are likely to be regularly present and are likely to be exposed for a period of time appropriate to the averaging period of the objective. Authorities should not consider exceedences of the objectives at any location where relevant public exposure would not be realistic”

6.7.7 Assessment of air quality impacts for ecosystems uses Critical Levels and Critical Loads. Critical Levels are a set of concentration thresholds for oxides of nitrogen (NO_x), sulphur dioxide (SO₂) and ammonia (NH₃), set for a specified habitat or location. They represent the gaseous concentration of pollutants in the atmosphere. For nitrogen and acid deposition, Critical Loads are used to differentiate between habitats depending upon their known sensitivity to eutrophication and acidification. Critical Loads are different to Critical Levels, in that they represent a quantitative estimate of pollutant deposited from the air to the ground. Therefore, this differing receptor sensitivity is incorporated into the assessment of effects in terms of percentage increases generated in relation to the set Critical Load limits.

6.7.8 For the Critical Levels, any increase in ambient concentrations of NO_x, SO₂ and NH₃ at ecological sites above the relevant Critical Level values does not in itself constitute a significant effect but, rather, increases the risk of harm occurring.

6.7.9 In relation to Critical Loads, Natural England and the Environment Agency (Reference 31. NE/EA) advise that, if effects due to development are less than 1% of the critical load limits set for a habitat, then these effects can be considered to be insignificant and screened-out of the assessment. However, this does not automatically imply that effects in excess of this 1% threshold

are significant. The significance of any effect will be habitat and habitat-feature specific. A recent IAQM Position Statement (Reference 29. IAQM) advises that:

“It is the position of the IAQM that the use of a criterion of 1% of an assessment level in the context of habitats should be used only to screen out impacts that will have an insignificant effect. It should not be used as a threshold above which damage is implied and is therefore used to conclude that a significant effect is likely. It is instead an indication that there may be potential for a significant effect, but this requires evaluation by a qualified ecologist and with full consideration of the habitat’s circumstances. The criterion also is intended to apply to an individual source and is not intended to be applied to multiple sources ‘in combination’.”

Table 6.8 Summary of assessment methodology

Receptor Identification	Assessment Technique	Magnitude of Change Assessment	Significance of Effect Evaluation
Human receptor - exhaust emissions	<ul style="list-style-type: none"> Quantify source emissions; Dispersion modelling to quantify effect at receptors; Compare effect with AQS. 	EPUK/IAQM procedure	Function of air pollutant concentration change due to development as a percentage of the AQS and the total air pollutant concentration as a percentage of the AQS
Human and ecological receptors - fugitive dust emissions	<ul style="list-style-type: none"> Identify receptors and proximity to earthworks/construction activities in relation to frequency of occurrence of different wind speeds, dry days and directions; Assess number of dust risk days each receptor is exposed to 	Based upon number of dust risk days each receptor is exposed to and distance from earthworks and construction activities	After applying embedded environmental measures, evaluate residual potential for effects
Ecological receptor - NO _x & SO ₂ concentrations	<ul style="list-style-type: none"> Quantify source emissions; Dispersion modelling to quantify effect at receptors; Compare effect with AQS. 	Comparison with Critical Levels	Function of air pollutant concentration change due to development as a percentage of the AQS and the total air pollutant concentration as a percentage of the AQS
Ecological receptor - deposition of Nitrogen & Acidity	<ul style="list-style-type: none"> Quantify source emissions; Dispersion modelling to quantify effect at receptors; Compare effect with Critical Loads for specific habitat. 	<p><1% change - insignificant</p> <p>>1% change - potentially significant</p>	Will be conducted through HRA process.

Magnitudes of change assessment

6.7.10 A scheme for assessing the magnitude of change in ambient air quality concentrations at receptors was first developed by Environmental Protection UK (EPUK) and the Institute of Air Quality Management (IAQM) in 2010 and an updated version was released in 2015 (Reference 17. EPUK/IAQM). This scheme assesses the magnitude of change in ambient air quality as a function of the percentage increase in concentration relative to the relevant air quality standard and also takes into account the total ambient concentration as a percentage of the AQS. This is summarised in Table 6.9 below.

Table 6.9 Assessment of magnitudes of change in air quality

Annual average concentration at receptor in assessment year with development	% Change in concentration relative to AQS			
	>10%	6%-10%	2%-5%	<1%
110% or more of the AQS	Substantial	Substantial	Substantial	Moderate
103% to 109% of the AQS	Substantial	Substantial	Moderate	Moderate
95% to 102% of the AQS	Substantial	Moderate	Moderate	Slight
76% to 94% of the AQS	Moderate	Moderate	Slight	Negligible
75% or less of the AQS	Moderate	Slight	Negligible	Negligible

6.7.11 By way of example, consider a development that will add 5% of the nitrogen dioxide annual average AQS of 40 µg/m³ (2 µg/m³) to existing ambient levels. If the existing background nitrogen dioxide concentration is 25 µg/m³, then the resultant new, 'with development' concentration would be 27 µg/m³ and this would be assessed as a 'negligible' change, being less than 75% of the AQS. However, if the existing background nitrogen dioxide concentration were to be 42 µg/m³ and the total 44 µg/m³, then, being 110% of the AQS, the change would be assessed as 'substantial'.

Significance evaluation methodology

6.7.12 In accordance with the overall significance assessment methodology discussed in Chapter 3 of this report, with the exception of the issue of receptor sensitivity (discussed in paragraphs 6.7.2 to 6.7.9 above), the determination of the significance of an air quality effect at a specific human receptor is a function of the magnitude of change in concentration and the proximity to or exceedance of the AQS. Therefore, on this basis, the significance matrix in Table 6.10 below has been compiled.

Table 6.10 Significance assessment of air quality changes

Annual average concentration at receptor in assessment year with development	Magnitude of change			
	Substantial	Moderate	Slight	Negligible
110% or more of the AQS	Significant	Significant	Significant	Significant
103% to 109% of the AQS	Significant	Significant	Significant	Significant
95% to 102% of the AQS	Significant	Significant	Potentially Significant	Potentially Significant
75% to 94% of the AQS	Potentially Significant	Potentially Significant	Not Significant	Not Significant
<75% of the AQS	Not Significant	Not Significant	Not Significant	Not Significant

6.7.13 The rationale underlying this table is as follows. Where there are exceedances of the AQS forecast in the ‘with development’ case (between 103% and 110% or more of the AQS), it is considered that this will constitute a ‘Significant’ effect. There are, however, other categories of effect that also could involve an exceedance of the AQS and which are termed ‘Potentially Significant’. These include circumstances where ‘Negligible’ and ‘Slight’ magnitudes of change result in air pollutant concentrations that lie between 95% and 102% of the AQS and also where ‘Moderate’ and ‘Substantial’ magnitudes of change result in air pollutant concentrations that lie between 75% to 94% of the AQS.

Methodology for prediction of effects - fugitive dust

6.7.14 For fugitive dust emissions, the significance of potential dust effects is determined by a number of factors, including the sensitivity of the receptor (e.g. residential receptors would typically be considered of greater sensitivity than most commercial receptors) and the magnitude of the change in dust that occurs. Although there are a number of ways in which dust can be quantified, it is difficult to relate the amount of potential dust deposition to significant effects. Instead, it is considered more valid to assess dust receptors on the basis of their relative risk of exposure.

6.7.15 This entails taking into account a number of pertinent factors, including the proximity of a receptor to a potential dust generating activity and its relative position in terms of prevailing wind direction. The nature and duration of an activity, together with other climatic factors, such as site rainfall levels, are also important factors in determining the risk, prior to the incorporation of mitigation measures, which include the quality of the site design and the efficiency and effectiveness of site management. Significant adverse effects are more likely to occur where a high or medium sensitivity receptor is located close to (and downwind) from a dust generating activity for prolonged periods of time and where effective mitigation measures cannot be implemented.

- 6.7.16 Identification of the sensitivity of potential dust sensitive receptors is taken from Technical Guidance to the NPPF (Reference 18. IAQM) and summarised in **Table 6.11** below. Dust sensitive receptors located within 200 m and 200 m to 500 m of the Moorside Project Sites consist mainly of residential properties; offices; farms; and light industry and would therefore mainly be categorised as being of medium or low sensitivity, as indicated in **Table 6.11**.
- 6.7.17 The operational phase of the Moorside Project is not expected to impact on fugitive dust emissions, whereas, during the site preparation, earthworks and construction phases dust emission may have the potential to cause nuisance. This is true for both the Moorside Site, the Accommodation Sites, the Corkickle to Mirehouse Railway Site and the St. Bees Railway Site although the scale of the work on the Moorside Site is expected to be much larger and therefore impacts may be greater. It is not considered that activity at the sites for the Highway Improvements would give rise to significant dust effects, given the relatively modest scale of construction work involved.

Table 6.11 Examples of dust sensitive receptors

High Sensitivity	Medium Sensitivity	Low Sensitivity
Hospitals and clinics Hi-tech industries Painting and furnishing Food processing	Schools Residential areas and properties Food retailers Greenhouses and nurseries Horticultural land Offices	Farms Light and heavy industry Outdoor storage

- 6.7.18 The methodology adopted for the assessment of the magnitude of change due to potential dust emissions during the site preparation and construction of the Moorside Project adopts a risk-based approach, which is aligned with the latest Government guidance (Reference 19. DCLG). The approach therefore involves consideration of a range of factors including the following:
- The existing baseline conditions, including the prevailing meteorological conditions and the proximity of receptors to the site;
 - The type of site activities that have the potential to lead to dust emissions, including earthworks, construction and trackout (the transfer of mud and dust from construction sites onto the public road network by vehicles); and
 - The dust mitigation measures that can be effectively implemented.
- 6.7.19 The potential for dust emission and dispersal is predominantly influenced by prevailing meteorological conditions. There are various other factors, which must also be considered in order to assess the extent of dust generation and dispersal at a particular site and what, if any effects these will have on any sensitive receptor. These include:
- Wind speed and direction;
 - Rainfall;

- Ground moisture conditions;
- Distance from dust source to the receptor(s); and
- Sheltering features, including topography, purpose-made screening and shrub and tree cover.

6.7.20 The dust risk assessment, therefore, considers the likely percentage of the year when winds above 5 m/s are blowing from the site towards the sensitive receptor during dry days (<0.2 mm rainfall) and the site activity is within a distance of both 200 m and 500 m of the receptor. The percentage of time that a receptor is at risk is calculated on this basis, using real meteorological data.

6.7.21 **Table 6.12** below details how the magnitude of change in dust is assessed, taking into account the imposition of standard dust mitigation and/or controls.

Table 6.12 Scheme for assessing magnitude of change in mitigated dust levels

Activity range from receptors	At risk percentage				
	>10%	5-10%	2-5%	1-2%	<1%
0-200 m	Moderate	Moderate	Slight	Negligible	Negligible
200-500 m	Moderate	Slight	Negligible	Negligible	Negligible

Significance evaluation methodology

6.7.22 The determination of significance of an air quality effect at a specific human receptor is a function of the magnitude of change in concentrations and the receptor sensitivity. **Table 6.13** shows the interaction between sensitivity and magnitude, and how this has been used to determine the significance of any dust effects arising particularly during the earthworks and construction phases of the Moorside Project. The purple shading indicates those effects that are considered significant and where additional, specialist mitigation measures would be necessary.

Table 6.13 Significance assessment of fugitive dust effects

Magnitude	Receptor sensitivity		
	High	Medium	Low
Moderate	Significant	Significant	Potentially Significant
Slight	Potentially Significant	Not Significant	Not Significant
Negligible	Not Significant	Not Significant	Not Significant

6.8 Preliminary assessment of residual effects

Baseline conditions

6.8.1 Using the results of the baseline air quality surveys to date (end of March 2016) at 29 monitoring locations across the study areas, representative of human and ecological receptors likely to be affected by activities taking place in connection with the Moorside Project, **Figure 6.17** summarises the current baseline air quality in the study area for the different monitoring locations. The filled segments of the circles on the map represent the measured air pollutant concentrations (of nitrogen dioxide (NO₂) sulphur dioxide (SO₂) and fine particulate matter (PM₁₀ and PM_{2.5}), expressed as a proportion of the applicable annual average UK Air Quality Standard (AQS)⁵. For example, where a circle is one-quarter filled for NO₂, the air concentration would be 10 µg/m³, 25% of the 40 µg/m³ AQS.

Nitrogen dioxide

6.8.2 The baseline measurements for NO₂ are summarised in **Table 6.14**. Period (1-12 months) average NO₂ concentrations were within the AQS of 40 µg/m³ at all of the 29 receptor locations. The highest concentrations were measured at a busy road junction in Whitehaven (36.3 µg/m³), and at the roundabout in Egremont at the junction of the A595(T) and East Road/ Main Street (35.1 µg/m³). At all other locations, concentrations were less than 75% of the AQS.

⁵ In this case, only 9 months or less of data are available, so the measurements are termed “a period average” rather than an annual average.

Table 6.14 2015/2016 baseline monitoring results - nitrogen dioxide

Site No.	Name	Monitoring Duration (months)*	Period Mean ($\mu\text{g}/\text{m}^3$)	% of Annual AQS	Comments
Moorside Sites					
15	Beckermet	12	7.4	18%	To date, monitored concentrations of nitrogen dioxide at these locations are below 20% of the relevant annual mean AQS. It is important to note that sites 15 and 17, being representative of human receptors, are assessed against an annual mean of $40 \mu\text{g}/\text{m}^3$, whilst sites 20 and 21, being ecological receptors, are assessed against an annual mean of $30 \mu\text{g}/\text{m}^3$.
17	Sellafield	5	7.2	18%	
20	Silver Tarn, Hollas and Harnsey SSSI	5	5.2	17%	
21	Low Church Moss SSSI	8	4.9	16%	
Accommodation Sites					
11	Mirehouse Site	5	7.7	19%	Monitoring locations for three of the Accommodation Sites are located on the sites themselves, whereas sites 12 and 30 are located at residential receptors on the applicable Site boundary. To date, concentrations at the Accommodation Sites, representative of human receptors, are all within 30% of the annual mean AQS. Please note that monitoring at site 12 was moved from the roadside to a residential property (both adjacent to the Corkickle Site) in October 2015. Site 10 has now been decommissioned.
12	Corkickle Site	11	10.2	25%	
30	Egremont Site	5	9.2	23%	
Railway Sites					
24	Corkickle to Mirehouse Railway Site	3	8.0	20%	To date, monitored NO_2 concentrations at these locations have been no more than 20% of the annual mean AQS.
25	St. Bees Railway Site	6	7.4	18%	

Site No.	Name	Monitoring Duration (months)*	Period Mean ($\mu\text{g}/\text{m}^3$)	% of Annual AQS	Comments
31	Corkickle to Mirehouse Railway Site	No results to date.			
Roadside Sites					
1	Central Whitehaven	12	36.3	91%	<p>In Cumbria, as an area of generally good air quality, emissions to air from vehicular transport were expected to result in the highest concentrations of nitrogen dioxide.</p> <p>Having taken this into consideration on selection of the monitoring sites, there are 8 monitoring locations situated alongside the A595(T). The highest results are consistently recorded at these locations, where heavy traffic is not uncommon, and concentrations range from $36.3 \mu\text{g}/\text{m}^3$ (91% of AQS) in Central Whitehaven, to $18.0 \mu\text{g}/\text{m}^3$ (45% of AQS) in Calder Bridge. Results from locations on the A5086 are the next highest, at sites 9 and 18.</p> <p>Other roadside locations comprise those in Winscales, Millom and Thornhill residential, which are situated on quieter roads.</p> <p>Sites 5, 7 and 8 have been decommissioned.</p>
2	South Whitehaven	12	17.9	45%	
3	Egremont	12	35.1	88%	
4	Calder Bridge 1	12	29.1	73%	
5	Winscales	11	10.6	26%	
6	Distington	12	26.4	66%	
7	Millom	11	14.6	37%	
8	Millom residential	11	6.5	16%	
9	Cleator Moor	12	14.9	37%	
14	Blackbeck	12	24.1	60%	
16	Calder Bridge 2	12	18.0	45%	
18	Cleator	12	16.1	40%	
19	Thornhill residential	12	10.3	26%	
22	Thornhill A595	6	25.7	64%	
Railside Sites					

Site No.	Name	Monitoring Duration (months)*	Period Mean ($\mu\text{g}/\text{m}^3$)	% of Annual AQS	Comments
13	Braystones	5	5.7	14%	To date, monitored concentrations of nitrogen dioxide at these locations are below 25% of the relevant annual mean AQS. It is important to note that these locations were chosen because of their close proximity to the railway line and, therefore, to be representative of receptors that may experience an air quality impact as a result of emissions from diesel locomotives, the number and movements of which may increase as a result of the Moorside Project. Sites 23, 26, 27 and 28 have been decommissioned.
23	Harrington	5	10.1	25%	
26	Seascale	4	9.2	23%	
27	Bootle	5	5.8	15%	
28	Millom, The Green	5	5.7	14%	

*Monitoring duration as at March 2016. Monitoring was phased in at different times at different sites, however, at the end of the monitoring period, there will be least 6 months of available data for each site.

Particulate matter (PM₁₀ and PM_{2.5})

- 6.8.3 The baseline measurements for fine particulate matter, on-going at the Beckermets background and A595(T) Thornhill roadside sites, show period average concentrations at the time of writing of PM₁₀ at 21.9 and 25.1 µg/m³ (55% and 63% of the annual AQS) and PM_{2.5} at 11.1 and 10.7 µg/m³ (44% and 43% of the annual AQS), respectively.

Sulphur dioxide

- 6.8.4 The baseline measurements for SO₂ commenced in October 2015 at Low Church Moss SSSI, The Spinney and Beckermets and six months' results are available to date. Thus far, results at all sites are well below the annual average AQS, with concentrations at less than 10% of the standard. Although, strictly speaking, this AQS only applies to ecological receptors, it can be used as an indicator for sites at Beckermets and The Spinney, to show that SO₂ concentrations in the area are low, as was expected prior to the commencement of monitoring.

Dust

- 6.8.5 The baseline measurements for fugitive dust are presented in **Table 6.15**. Period mean results for fugitive dust are evaluated against a nuisance guideline of 100 mg m⁻² day⁻¹, as the suggested level at which complaints may be possible in open country (Reference 30. Vallack and Shillito).

Table 6.15 2015/2016 baseline monitoring results - fugitive dust

Site No.	Name	Monitoring Duration (months)*	Period Mean (mg. m ⁻² d ⁻¹)	% of Annoyance Criterion	Comments
Moorside Sites					
15	Beckermet	No results to date.			Baseline fugitive dust results for the Moorside Site locations are currently below 25% of the annoyance criterion. Dust monitoring at site 15, Beckermet commenced 30 March 2016.
17	Sellafield	5	15.8	16%	
21	Low Church Moss SSSI	7	18.3	18%	
Accommodation Sites					
10	Cleator Moor Site	5	10.5	11%	Baseline results for dust at the Accommodation Sites are well below the annoyance criterion of 100 mg. m ⁻² d ⁻¹ . Site 10 has been decommissioned.
11	Mirehouse Site	5	16.3	16%	
12	Corkickle Site	5	15.5	16%	
30	Egremont Site	5	20.3	20%	
Railway Sites					
24	Corkickle to Mirehouse Railway Site	3	26.0	26%	Results for St. Bees have been significantly higher compared to the Corkickle to Mirehouse Railway Site location. As a consequence, it is proposed that dust samples will be analysed further in the laboratory to identify the elemental composition and potential source. Dust monitoring at site 31 commenced 30 March 2016.
25	St. Bees Railway Site	5	296.8	297%	
31	Corkickle to Mirehouse Railway Site	No results to date.			

Site No.	Name	Monitoring Duration (months)*	Period Mean (mg. m ⁻² d ⁻¹)	% of Annoyance Criterion	Comments
Roadside Sites					
Not applicable					
Rail Sites					
13	Braystones	5	118.0	118%	<p>Baseline results for the Rail Sites are amongst the highest for the fugitive dust monitoring, however period mean results are below 50% of the annoyance criterion at most sites.</p> <p>The results for Braystones were at a similar level to those of the other Rail Sites, however a result of 329 mg. m⁻² d⁻¹ was recorded in January 2016, which has skewed the mean result.</p> <p>Sites 23, 26, 27 and 28 have been decommissioned.</p>
23	Harrington	5	20.5	21%	
26	Seascale	5	34.0	34%	
27	Bootle	5	26.8	27%	
28	Millom, The Green	5	15.7	16%	

Predicted residual effects and their significance

6.8.6 This section of the air quality chapter provides a preliminary assessment of the likely residual air quality effects arising from the construction and operation of the individual elements of the Moorside Project. Where detailed or generic design information is available (such as for the standby diesel generators), a quantitative assessment has been conducted. Where such design detail is not yet available, an assessment has been carried out based upon professional judgement.

Standby diesel generators

6.8.7 An assessment of the air quality impacts arising from operation of the standby diesel generators (DGs) associated with the Moorside Power Station has been undertaken as part of the Draft Combustion Activity Permit Application. Other impacts have been excluded from this particular assessment, such as emissions during the construction phase, as information is not yet available.

6.8.8 The assessment is based on information contained in the Generic design Assessment Decision Document for the AP1000 © (Reference 33. EA), which identifies that there would be two standby diesel generators for each individual reactor, of thermal input rating 12.9 megawatts (MW) each (see also **Section 2.2** of this document).

6.8.9 The sources of emissions considered were the standby diesel generators which provide electrical power in the event of a loss of off-site power (LOOP) (two generators per reactor, six in total) and the (single) auxiliary boiler which provides space heating to ancillary buildings for the MPS. Scenarios for the operation of these sources were developed based on experience with other nuclear power stations.

6.8.10 The atmospheric dispersion of pollutants was calculated using detailed dispersion modelling software (The UK Atmospheric Dispersion Modelling System - ADMS). Dispersion was calculated using ten years of meteorological data; results are presented for the worst year (i.e. the meteorological year that leads to the highest concentration) on a receptor-by-receptor and pollutant-by-pollutant basis. Air concentrations of oxides of nitrogen (NO_x), nitrogen dioxide (NO₂), particulate matter (PM₁₀), carbon monoxide (CO) and sulphur dioxide (SO₂) were calculated over suitable averaging periods, together with nitrogen deposition and acid deposition. Concentrations were compared against relevant air quality standards, environmental assessment levels and Critical Levels. Modelled deposition rates were compared against Critical Loads.

Operation and emission scenarios

6.8.11 There are three potential operating scenarios for the DGs:

- Commissioning - ensures that the DGs are able to operate under the correct working conditions;

- Routine testing - consisting of preservative maintenance as well as testing to confirm the equipment can perform its duty when called upon; and
- LOOP - in the event of a loss of off-site power.

It is conservatively assumed that the boiler will only operate continuously between the months of September to May at its maximum continuous rating.

Summary of conclusions

- 6.8.12 The modelling shows that, under conservative assumptions, there is no risk of the Air Quality Standards being exceeded for PM₁₀, PM_{2.5}, SO₂ or CO at any relevant receptor under any scenario.
- 6.8.13 For the hourly mean NO₂ and the daily mean NO_x air quality standards, the conservative modelling suggests that exceedances are theoretically possible. **Table 6.16** below summarises the number of human and ecological receptors with exceedances under each short-term scenario. However, it is important to note that in reality, the occurrence of these exceedances is extremely unlikely, as is explained in paragraphs 6.8.17 to 6.8.19 below. A more detailed commentary on results for each pollutant follows from paragraph 6.8.15. The locations of human and ecological receptors used in the modelling can be viewed in **Figures 6.4, 6.14 and 6.15**.
- 6.8.14 Regarding deposition onto ecological sites, it is shown that the contribution from the proposed installation is small at all receptors, and where there are exceedances of Critical Loads, these are due to existing sources.

Table 6.16 Exceedances at human and ecological receptors

	Number of receptor points with exceedances	As a percentage of total relevant receptors*	Named receptor groups with exceedances
Human Receptors: Hourly Mean NO₂			
Routine Test Scenario	0	0%	N/A
Commissioning Scenario	7	3%	Sellafield Road Nursery Road
LOOP Scenario	35	17%	Southern Beckermets Central Beckermets Northern Beckermets Blackbeck Haile
Ecological Receptors: Daily Mean NO_x			
Routine Test Scenario	27	31%	Braystones River Ehen CWS Sellafield Disused Railway CWS Sellafield Tarn CWS Low Church Moss SSSI Nursery Wood AW
Commissioning Scenario	37	42%	Nursery Wood AW Haile Great Wood SSSI Low Church Moss SSSI Braystones Coast CWS Sellafield Tarn CWS Sellafield Disused Railway CWS Braystones River Ehen CWS
LOOP Scenario	59	67%	Silver Tarn Hollas and Harnsey Mosses SSSI Nursery Wood AW Black Moss SSSI Haile Great Wood SSSI Low Church Moss SSSI Braystones Coast CWS Sellafield Tarn CWS Sellafield Disused Railway CWS Braystones River Ehen CWS

	Number of receptor points with exceedances	As a percentage of total relevant receptors*	Named receptor groups with exceedances
			Terrace Bank Wood CW Calder Bank Wood AW Priorling Wood AW Robertgate and High Woods AW

*A total of 205 human receptors and 88 ecological receptors have been considered in the assessment. Refer to **Figures 6.2 - 6.5** for receptor locations. It is important to note that the majority of sites are represented by more than one receptor point in the model and therefore the number of receptor points with exceedances will exceed the number of named receptor groups with exceedances.

- 6.8.15 Using worst-case assumptions in the modelling assessment, **Table 6.16** shows that the LOOP scenario has the ability to create the most exceedances of hourly mean NO₂ at human receptors and daily mean NO_x at ecological receptors. However, the likelihood of this happening in reality is extremely small, as is explained further in paragraphs 6.8.17 to 6.8.19.

Nitrogen dioxide

Annual mean (long-term)

- 6.8.16 The maximum annual mean NO₂ Predicted Environmental Concentration⁶ (PEC) at any relevant human receptor location is predicted as 4.5 µg m⁻³ or 11.2% of the AQS at the St Bridgets Place of Worship (PW) receptor. The same receptor experiences the greatest change in concentration from background levels, namely 0.4 µg m⁻³. The increase in concentration at all the other modelled receptors can be described as a 'Negligible' impact. Given the small increase, as well as the conservatism of the modelling assumptions, this impact on the St Bridgets Place of Worship (PW) receptor is not considered to be significant.

Hourly mean (short-term)

- 6.8.17 In the Routine Test scenario (the only regularly occurring short-term scenario), the maximum 99.79 percentile 1-hour mean NO₂ PEC at any relevant human receptor location is predicted to be 156.9 µg m⁻³ or 82.5% of the AQS at the Nursery Road 4 receptor. In the Commissioning scenario, the maximum PEC is 282.5 µg m⁻³ or 141.3% of the AQS, again at the Nursery Road 4 receptor. In the LOOP scenario, the maximum PEC is 734.1 µg m⁻³ or 367.1% of the AQS, once more at the Nursery Road 4 receptor.
- 6.8.18 As noted above, this calculation is based on a number of conservative assumptions, so these concentrations are overestimated. In particular, the calculation assumes that the diesel generators are operating during those 18 hours of the year when the weather conditions are those that produce the highest concentrations at the relevant receptors.
- 6.8.19 Considering the Unit 2 Commissioning scenario with 2006 Numerical Weather prediction (NWP) meteorology, if the DGs were to operate all year there would be 27 hours of the year when the NO₂ PEC concentration would be over the limit of 200 µg m⁻³ at the Nursery Road 4 receptor. For Unit 1 Commissioning the equivalent number is 25 hours of the year and, for Unit 3 Commissioning, it is 21 hours of the year. Given that the commissioning phase will last for just 72 hours, of which only 48 hours will have both DGs for the unit operating concurrently, it is extremely unlikely that plant will be operating for 18 of the 27 hours which produce a PEC over 200 µg m⁻³. The hours when the PEC is greater than 200 µg m⁻³ are distributed randomly throughout the year. Since the commissioning tests will take place during a short period of a few

⁶ The PEC is the sum of the predicted contribution from an emissions source to ambient air pollutant concentrations plus the existing baseline concentration at a receptor.

contiguous days, it is therefore extremely unlikely for the commissioning tests to cause more than 18 exceedances per year of the $200 \mu\text{g m}^{-3}$ level.

- 6.8.20 These results are the maxima modelled at any of the receptors from the 10 years of hourly sequential meteorological data. So, there is no realistic possibility that the Commissioning scenario will, in reality, cause an exceedance of the hourly NO_2 Air Quality Objective. Similar arguments apply to the LOOP scenario. It can therefore be concluded that the impacts of the proposed installation, in terms of short-term NO_2 , are Not Significant.

Particulates

- 6.8.21 The maximum annual mean PM_{10} PEC at any relevant human receptor location is predicted as $10.2 \mu\text{g m}^{-3}$ or 25.5% of the AQS at the St Bridgets PW receptor. The contribution from the installation here is just $0.03 \mu\text{g m}^{-3}$. This is also the location with the greatest change in concentration from background levels.
- 6.8.22 The maximum annual mean $\text{PM}_{2.5}$ PEC at any relevant human receptor location is predicted as $6.7 \mu\text{g m}^{-3}$ or 26.9% of the AQS, again at the St Bridgets PW receptor. Again, the contribution from the installation here is $0.03 \mu\text{g m}^{-3}$, and this is the location with the greatest change in concentration from background levels.
- 6.8.23 These impacts are considered to be Not Significant.
- 6.8.24 For the LOOP scenario, the maximum 90.41 percentile 24-hour mean PM_{10} PEC at any relevant human receptor location is predicted as $23.7 \mu\text{g m}^{-3}$ or 47.3% of the AQS at the Glenholme receptor. The contribution from the installation here is just $3.3 \mu\text{g m}^{-3}$. This is also the location with the greatest change in concentration from background levels. For the other short-term scenarios, the concentrations are lower.
- 6.8.25 It can be concluded that the impacts on PM_{10} and $\text{PM}_{2.5}$ concentrations are Not Significant.

Carbon monoxide

- 6.8.26 In the LOOP scenario, the maximum 1 hour mean CO PEC at any relevant human receptor location is predicted as $812 \mu\text{g m}^{-3}$ or 2.7% of the EAL at the Nursery Road 5 receptor. The greatest Process Contribution⁷ (PC) is $484 \mu\text{g m}^{-3}$ at the same receptor. The maximum rolling 8 hour mean CO PEC at any relevant human receptor location is predicted as $897 \mu\text{g m}^{-3}$ or 9.0% of the AQS, at the Nursery Road 5 receptor. The greatest PC is $569 \mu\text{g m}^{-3}$ at the same receptor. For the other short-term scenarios, the concentrations are lower.
- 6.8.27 These results are comfortably within the AQS, even without taking account of the conservatism of the calculations or the very low probability of the LOOP

⁷ The Process Contribution is the contribution to air pollutant concentration at a receptor from an emission source.

scenario occurring. On this evidence, emissions of CO from the installation are likely to have a negligible impact on human health.

Sulphur dioxide

- 6.8.28 The highest concentrations, relative to the respective AQS, are for the LOOP scenario and the 15 minute averaging period. The maximum 99.9 percentile 15 minute mean SO₂ PEC at any relevant human receptor location is predicted as 125.8 µg m⁻³ or 47.3% of the AQS at the Nursery Road 5 receptor. This is comfortably within the AQS, even without taking account of the conservatism of the calculations or the very low frequency of the LOOP scenario occurring. On this evidence, emissions of SO₂ from the installation are likely to have a Negligible impact on human health and are considered Not Significant.

Critical Levels: NOx

- 6.8.29 The maximum annual mean NO_x PEC at any relevant ecological receptor location is predicted as 8.8 µg m⁻³ or 29.4% of the Critical Level at the Low Church Moss 1 receptor. This is comfortably below the critical level of 30 µg m⁻³. At ecological sites other than Low Church Moss, the annual mean NO_x PC is everywhere less than 1 µg m⁻³ and the PEC is everywhere less than 6 µg m⁻³ or 20% of the Critical Level.
- 6.8.30 Under the conservative modelling assumptions, the assessment has indicated that the daily mean NO_x may exceed the Critical Level at locations around the site by substantial margins. This EAL is based on WHO guidance which assumes that O₃ or SO₂ are present at or above their Critical Levels, which is highly unlikely to be the case. In addition, as previously noted, the calculations of daily mean NO_x are based on the pessimistic assumption that the plant is operating during all those hours that give the highest concentrations, so the numbers above are overestimated. In this regard, predicted concentrations at ecological receptors resulting from the installation are expected to result in Not Significant adverse effects at these locations.

Critical Levels: SO₂

- 6.8.31 The maximum annual mean SO₂ PEC at any relevant ecological receptor location is predicted as 3.4 µg m⁻³ or 17.1% of the Critical Level at the Low Church Moss 1 receptor. This is comfortably below the Critical Level of 20 µg m⁻³.
- 6.8.32 At ecological sites other than Low Church Moss, the annual mean SO₂ PC is everywhere less than 0.5 µg m⁻³ and the PEC is everywhere less than 1.7 µg m⁻³ or 8.3% of the Critical Level.

Critical Loads: Nitrogen deposition

- 6.8.33 The maximum long term nutrient nitrogen deposition rate is predicted as 0.37 kg N ha⁻¹ y⁻¹ at the Low Church Moss 1 receptor, which represents 3.7% of the lower critical load of 10 kg N ha⁻¹ y⁻¹. The Critical Load class for Low Church

Moss is “Broadleaved deciduous woodland”. This receptor has the highest PC as a percentage of Critical Load.

- 6.8.34 At ecological sites other than Low Church Moss, the PC is everywhere less than 1% of the relevant Critical Load.
- 6.8.35 In terms of PEC (which in this context means total deposition), the highest value at the modelled receptors is 18.9 kg N ha⁻¹ y⁻¹ at the Lake District High Fells 3 receptor. However the PC here is <0.001 kg N ha⁻¹ y⁻¹. This increment is less than 1% (0.03%) of the lower critical load for nitrogen set to protect the most sensitive habitat and is therefore considered to be Not Significant.

Critical Loads: Acid deposition

- 6.8.36 The highest deposition for both sulphur and nitrogen is at the Church Moss 1 receptor. Using the acid deposition assessment tool on the Air Pollution Information System (APIS) web site, there is no exceedance of the acid critical load at this receptor, and the process contribution to overall acid deposition is small (14% of the Critical Load function). At all designated sites (SSSIs or SACs) other than Low Church Moss, the PC is everywhere less than 1% of the relevant Critical Load.
- 6.8.37 There are some relevant receptors in the vicinity of the Moorside Site where there are exceedances of the Critical Load. For example at the Lake District High Fells 3 receptor. However, the process contribution at these receptors is extremely small (<0.1%) and the exceedance is due to existing emission sources.
- 6.8.38 A summary of the preliminary assessment of the predicted residual effects (taking into account the mitigation measures set out in **Table 6.7** above) is provided, with respect to the types of effects at each of the key receptors or receptor groups at each Moorside Project Site, in **Tables 6.17 to 6.23**. Where insufficient development and/or baseline information is available to undertake a prediction of the magnitude of change, professional judgement has been applied to arrive at an assessment of effects.
- 6.8.39 With regard to receptor sensitivity, this is only defined for fugitive dust emissions, where it is possible to identify differing sensitivities. For other air pollutants, which are the subject of Air Quality Standards (AQS) and Limit Values set by the UK Government and the European Union respectively, the sensitivity of the receptors, whether human beings or ecological sites, is taken account of in the setting of standards and Limit Values. Where this applies in the evaluation tables, the receptor sensitivity column is populated with a hash (#) only.
- 6.8.40 At this stage the evaluation tables only deal with the construction and operational phases of the development at each Moorside Project Site. Furthermore, it should be noted that following their construction, the Accommodation Sites, the Corkickle to Mirehouse Railway Site and the St. Bees Railway Site will be operational for a period of time when the Moorside Site is still under construction. The evaluation tables present a preliminary

assessment of the potential adverse effects arising from the Moorside Project unless explicitly stated to be neutral or beneficial in the rationale.

Development proposed at the Moorside Site

Construction

- 6.8.41 The preliminary assessment of predicted residual effects for air quality during the construction period has been evaluated based on previous air quality assessment experience of similar projects, as well as any site-specific information received to date, including the likely volume of earth to be moved during site preparation and the locations of receptors. Once more detailed information on plant equipment and usage of the MOLF is available, the predicted residual effects associated with each emission source can be refined and will be reported on in the ES in 2017.
- 6.8.42 The effects of emissions from road traffic have been initially assessed using professional judgement based on past experience and the locations of relevant receptors in relation to the likely primary routes to and from the Moorside Site. At the present time, detailed traffic flow data for individual road links in the Moorside project area is not available. When this data becomes available in the future, a more detailed modelling assessment of the effects of road traffic generated air pollutants will be conducted.

Operation

- 6.8.43 Predicted residual effects during the operational period are associated with the use of on-site standby diesel generators (DGs), road traffic and shipping emissions whilst the MOLF is in use. Assessment of the DGs has been undertaken using detailed dispersion modelling as detailed in the above sections on “Operational Combustion Plant Emissions Assessment”. The effects of emissions from road traffic have been initially assessed using professional judgement based on past experience and the locations of relevant receptors in relation to the likely primary road routes to and from the Moorside Site.

Decommissioning

- 6.8.44 Decommissioning has not been specifically assessed within the PEIR, as it remains uncertain at this point which elements would be decommissioned and when. Each of the Accommodation Sites and Additional Sites (including the Railway Sites) may see some element of decommissioning activity undertaken once the construction phase of the Moorside Site itself is complete (demolition or removal of certain features) and the effects of these operations are expected to be no greater than those in the construction phase assessments for these sites. The decommissioning phase of each Moorside Project Site will be assessed in the ES. As discussed at **Section 2.4**, decommissioning of the Moorside Power Station itself will also be included within the ES, but at a high level given that these activities will take place around 60 years after operations commence, and they will be covered by a discrete EIA of the activities at that time.

Table 6.17 Development proposed at the Moorside Site: Summary of predicted residual air quality effects

Receptor and summary of predicted effects	Probability	Sensitivity/value of receptor	Magnitude of change	Significance of effect	Rationale
Construction					
Residential properties in southern part of Beckermat - Sellafeld Road and Kirkbeck Drive					
Fugitive dust emissions from earthmoving and construction activities	Likely	Medium	Moderate	Potentially Significant	This group of properties would be closest to the northern landscaping mounds (west and east) that are necessary to create the landform of the Moorside Site
Exhaust emissions from non-road mobile machinery (NRMM) activity during earthmoving and construction activities	Likely	#	Moderate	Potentially Significant	This group of properties would be closest to the northern landscaping mounds (west and east) that are necessary to create the landform of the Moorside Site. Whilst existing background levels of air pollutants (for example, nitrogen dioxide and fine particulate matter ⁸) are well below the statutory air quality standards (AQS), there could be moderate changes in air quality as a result of activities.
Exhaust emissions from marine vessels using the marine off-loading facility (MOLF)	Likely	#	Negligible to Slight	Not Significant	These receptors are distant (~3 km) from the source of the emissions to atmosphere at the MOLF and dispersion and dilution in the atmosphere would attenuate the effects.
Road traffic exhaust emissions	Likely	#	Negligible	Not Significant	The main road routes that would be used to access and egress the Moorside Site during construction would be located away from Beckermat.

⁸ Fine particulate matter - PM₁₀ & PM_{2.5} - particles emitted from vehicle exhausts that are of diameter less than 10 µm and 2.5 µm, respectively.

Receptor and summary of predicted effects	Probability	Sensitivity/value of receptor	Magnitude of change	Significance of effect	Rationale
Residential properties in the centre of Beckermet - Nursery Road, Morass Road, Station Crescent and Braystones Road					
Fugitive dust emissions from earthmoving and construction activities	Likely	Medium	Slight to Moderate	Not Significant	This group of properties are further removed from the northern extent of the earthworks that are necessary to create the landform of the Moorside Site, in comparison to the receptors referred to above.
Exhaust emissions from non-road mobile machinery (NRMM) activity during earthmoving and construction activities	Likely	#	Slight to Moderate	Potentially Significant	This group of properties are further removed from the northern extent of the earthworks that are necessary to create the landform of the Moorside Site. Whilst existing background levels of air pollutants (for example, nitrogen dioxide and fine particulate matter ⁹) are well below the statutory air quality standards (AQS), there could be Slight to Moderate changes in air quality as a result of activities.
Exhaust emissions from marine vessels using the marine off-loading facility (MOLF)	Likely	#	Negligible	Not Significant	These receptors are distant (~3.2 km) from the source of the emissions to atmosphere at the MOLF and dispersion and dilution in the atmosphere would attenuate the effects.
Road traffic exhaust emissions	Likely	#	Negligible	Not Significant	The main road routes that would be used to access and egress the Moorside Site during construction are located away from Beckermet.
Residential properties in northern Beckermet - Morass Road North, Mill Lane, Lowry Close, Fleming Drive, Beck Rise, Hunter Rise, Bankfield and The Millfields.					
Fugitive dust emissions from earthmoving and construction activities	Likely	Medium	Negligible to Slight	Not Significant	This group of properties in Beckermet is furthest of any away from the northern mounds (west and east) that are necessary to create the landform of the Moorside Site.

⁹ Fine particulate matter - PM₁₀ & PM_{2.5} - particles emitted from vehicle exhausts that are of diameter less than 10 µm and 2.5 µm, respectively.

Receptor and summary of predicted effects	Probability	Sensitivity/value of receptor	Magnitude of change	Significance of effect	Rationale
Exhaust emissions from non-road mobile machinery (NRMM) activity during earthmoving and construction activities	Likely	#	Negligible to Slight	Not Significant	This group of properties in Beckermat is furthest away from the northern extent of the earthworks that are necessary to create the landform of the Moorside Site.
Exhaust emissions from marine vessels using the marine off-loading facility (MOLF)	Likely	#	Negligible	Not Significant	These receptors are distant (~3.2 to 3.5 km) from the source of the emissions to atmosphere at the MOLF and dispersion and dilution in the atmosphere would attenuate the effects.
Road traffic exhaust emissions	Likely	#	Negligible	Not Significant	The main road routes that would be used to access and egress the Moorside Site during construction are located away from Beckermat.
Residential properties in Braystones - Beck Close, Nethertown Road and Egremont Road					
Fugitive dust emissions from earthmoving and construction activities	Likely	Medium	Negligible	Not Significant	The nearest receptors in Braystones are greater than 0.75 km from the boundary of the Moorside Site and dust emissions would be reduced by distance.
Exhaust emissions from non-road mobile machinery (NRMM) activity during earthmoving and construction activities	Likely	#	Slight	Not Significant	The nearest receptors in Braystones are greater than 0.75 km from the boundary of the Moorside Site. Exhaust emissions would be attenuated by distance.
Exhaust emissions from marine vessels using the marine off-loading facility (MOLF)	Likely	#	Slight	Not Significant	The nearest receptors in Braystones lie ~1.9 km from the MOLF and effects would be attenuated by distance.

Receptor and summary of predicted effects	Probability	Sensitivity/value of receptor	Magnitude of change	Significance of effect	Rationale
Road traffic exhaust emissions	Likely	#	Negligible	Not Significant	Receptors in Braystones are distant from the main road routes used during construction for movements to and from the Moorside Site.
Residential properties in Blackbeck - alongside the A595(T)					
Fugitive dust emissions from earthmoving and construction activities	Likely	Medium	Slight to Moderate	Potentially Significant	Receptors in Blackbeck lie ~300 m from the north-eastern edge of the earthworks that are necessary to create the landform of the Moorside Site.
Exhaust emissions from non-road mobile machinery (NRMM) activity during earthmoving and construction activities	Likely	#	Slight to Moderate	Potentially Significant	Receptors in Blackbeck lie ~300 m from the north-eastern edge of the earthworks that are necessary to create the landform of the Moorside Site. Even with the imposition of low-sulphur fuel and emission control mitigation, the effects could be Potentially Significant.
Exhaust emissions from marine vessels using the marine off-loading facility (MOLF)	Likely	#	Negligible to Slight	Not Significant	Receptors in Blackbeck lie ~3.5 km from the MOLF and this distance would attenuate the effects.
Road traffic exhaust emissions	Likely	#	Negligible to Slight	Not Significant	Receptors in Blackbeck lie alongside and within 200 m of the A595(T) and would be affected by emissions from passing construction traffic.
Residential properties in Calder Bridge - alongside the A595(T)					
Fugitive dust emissions from earthmoving and construction activities	Likely	Medium	Negligible to Slight	Not Significant	Receptors in Calder Bridge lie ~1.2 km from the eastern edge of the Moorside Site and at this distance dust effects that would arise post-mitigation are considered minimal.
Exhaust emissions from non-road mobile machinery (NRMM) activity	Likely	#	Negligible to Slight	Not Significant	Receptors in Calder Bridge lie ~1.2 km from the eastern edge of the Moorside Site and this distance is considered to effectively mitigate any effects.

Receptor and summary of predicted effects	Probability	Sensitivity/value of receptor	Magnitude of change	Significance of effect	Rationale
during earthmoving and construction activities					
Exhaust emissions from marine vessels using the marine off-loading facility (MOLF)	Likely	#	Negligible	Not Significant	Receptors in Calder Bridge lie ~3.5 km from the MOLF and this distance is considered sufficient to attenuate effects.
Road traffic exhaust emissions	Likely	#	Slight to Moderate	Potentially Significant	Receptors in Calder Bridge lie close to the kerbside of the A595(T) and, with moderate baseline concentrations of, for example, nitrogen dioxide from current traffic levels, the effects could be Potentially Significant.
Sella Park House Hotel, The Spinney and two semi-detached houses to north of Sella Park House Hotel					
Fugitive dust emissions from earthmoving and construction activities	Likely	Medium	Negligible to Slight	Not Significant	These receptors lie some 0.9 km from the eastern edge of the Moorside Site and, at this distance, dust effects that would arise taking into account design mitigation are considered to be effectively reduced.
Exhaust emissions from non-road mobile machinery (NRMM) activity during earthmoving and construction activities	Likely	#	Negligible to Slight	Not Significant	These receptors lie some 0.9 km from the eastern edge of the Moorside site and, at this distance, any effects would be effectively mitigated.
Exhaust emissions from marine vessels using the marine off-loading facility (MOLF)	Likely	#	Negligible	Not Significant	These receptors lie ~2.4 km from the MOLF and this distance is considered sufficient to attenuate effects.

Receptor and summary of predicted effects	Probability	Sensitivity/value of receptor	Magnitude of change	Significance of effect	Rationale
Road traffic exhaust emissions	Likely	#	Negligible to Slight	Not Significant	These receptors are not expected to experience additional traffic flows on the current southern Sellafeld Access Road and are sufficiently distant from the A595(T).
Sellafeld Receptors					
Fugitive dust emissions from earthmoving and construction activities	Likely	Medium to High	Slight to Moderate	Potentially Significant	It is possible that there could be dust-sensitive technological processes and buildings within the Sellafeld Site. Given the proximity of the earthmoving and construction activities on the adjacent Moorside Site, it is considered that there could be Potentially Significant effects.
SPA and SAC sites within 10 km of the Moorside Site boundary					
Exhaust emissions from non-road mobile machinery (NRMM) activity during earthmoving and construction activities	Likely	#	Negligible to Slight	Not Significant	The SACs within 10 km of the Moorside Site boundary include the River Ehen, Drigg Coast and Lake District High Fells sites. The closest point in any of these to the Moorside Site is the southern end of the River Ehen SAC at Woodend, just to the south of Cleator, more than 6 km north of the Moorside Site.
Exhaust emissions from marine vessels using the marine off-loading facility (MOLF)	Likely	#	Negligible to Slight	Not Significant	Given the likely scale of emissions from vessels and the distance from both the River Ehen and Drigg Coast SACs, it is considered that effects would be effectively mitigated.
Road traffic exhaust emissions	Likely	#	Negligible to Slight	Not Significant	The River Ehen SAC lies within 200 m of the A5086 in the Cleator and Cleator Moor area and an assessment of effects would need to be conducted if the changes in road traffic flows triggered the need for an assessment. However, given the likely level of increase in development (i.e. Moorside Project) related traffic, it is considered that the effects would be Not Significant.

Receptor and summary of predicted effects	Probability	Sensitivity/value of receptor	Magnitude of change	Significance of effect	Rationale
SSSI, county wildlife sites and ancient woodland within 2 km of the Moorside Site boundary					
Fugitive dust emissions from earthmoving and construction activities	Likely	Medium to High	Negligible to Slight	Not Significant	Low Church Moss SSSI, Braystones River Ehen CWS, Sellafield disused railway Line CWS, Sellafield Tarn CWS, Calder Bank Wood CWS, Braystones Coast CWS and Nursery Wood ancient woodland south-east of Beckermat all lie within the Moorside Site boundary. It is possible that effects upon some of these sites could be Potentially Significant but this is subject to on-going assessment and will be reported in the ES that is submitted in 2017.
Exhaust emissions from non-road mobile machinery (NRMM) activity during earthmoving and construction activities	Likely	#	Negligible to Slight	Not Significant	Low Church Moss SSSI, Braystones River Ehen CWS, Sellafield disused railway Line CWS, Sellafield Tarn CWS, Calder Bank Wood CWS, Braystones Coast CWS and Nursery Wood ancient woodland south-east of Beckermat all lie within the Moorside Site boundary. It is possible that effects upon some of these sites could be Potentially Significant but this is subject to on-going assessment and will be reported in the ES that is submitted in 2017.
Exhaust emissions from marine vessels using the marine off-loading facility (MOLF)	Likely	#	Negligible to Slight	Not Significant	Low Church Moss SSSI, Braystones River Ehen CWS, Sellafield disused railway Line CWS, Sellafield Tarn CWS, and Braystones Coast CWS all lie within the Moorside Site boundary and close to the MOLF. It is possible that effects upon some of these sites could be Potentially Significant but this is subject to on-going assessment and will be reported in the ES that is submitted in 2017.
Road traffic exhaust emissions	Likely	#	Negligible to Slight	Not Significant	Nursery Wood ancient woodland site lies adjacent to the Sellafield northern access road. Priorling Wood CWS lies close to the A595(T) in Calder Bridge and Calder Bank Wood CWS lies close to the current Sellafield southern access route. However, it is not anticipated that increases in road

Receptor and summary of predicted effects	Probability	Sensitivity/value of receptor	Magnitude of change	Significance of effect	Rationale
					traffic movements would be such as to generate discernible effects.
Roadside receptors along the A595(T) to the north and south of the Moorside Site and along the A5086 (Except Calder Bridge and Blackbeck - see above) in New Mill, Thornhill, Egremont, Bigrigg, Whitehaven, Cleator, Cleator Moor					
Road traffic exhaust emissions.	Likely	#	Negligible to Slight	Not Significant	The varying existing baseline air quality levels at receptors within a 400 m corridor centred upon these main roads means that, subject to the amount of the additional traffic generated by the Moorside Project, ' <i>Potentially Significant</i> ' effects could arise in Whitehaven, where air quality levels are >75% of the AQS. However, assessment work is on-going and will be reported in the ES that is submitted in 2017.
Rail-side receptors along the Cumbria Coast rail line to the north and south of the Moorside Site, from the Port of Workington in the north to Barrow-in-Furness in the south					
Fugitive dust blow-off from rail cars conveying aggregates and other friable materials	Likely	Medium	Slight to Moderate	Not Significant	The exact number of rail movements associated with the construction phase is not yet confirmed. However, given that the effects would be periodic, of short duration individually and only over the construction period, they are considered likely to be Not Significant. I
Exhaust emissions from diesel motive units	Likely	#	Negligible to Slight	Not Significant	The exact number of rail movements associated with the construction phase is subject to on-going modelling and this will be reported in the ES that is submitted in 2017.
Operation					
Residential properties in southern part of Beckermet - Sellafeld Road and Kirkbeck Drive					
Exhaust emissions from standby power generation	Likely	#	Negligible to Slight	Not Significant	Once the diesel generators are on-site, they will go through a commissioning phase. It is expected that approximately 72 hours of testing will be required for each DG, consisting

Receptor and summary of predicted effects	Probability	Sensitivity/value of receptor	Magnitude of change	Significance of effect	Rationale
plant - commissioning phase					of 24 hours of individual testing and 48 hours of combination testing. The expectation is that each DG will be tested individually and, as a result, there will only ever be a single DG operating at any moment in time across the three Units in this scenario. Therefore, the probability of significant air quality effects at the majority of receptors is low.
Exhaust emissions from standby power generation plant - routine testing	Likely	#	Negligible to Slight	Not Significant	Under routine operation, these standby diesel generators would operate for only 50 hours per year under weekly testing and the probability of significant air quality effects would be very low. For example, the increment to annual mean nitrogen dioxide (NO ₂) concentrations would be Negligible and Not Significant. Whilst it is theoretically possible for 50 hours' operation to give rise to exceedances of the hourly average NO ₂ AQS, the probability of this occurring is extremely low.
Exhaust emissions from standby power generation plant - abnormal operation	Unlikely	#	Slight to Moderate	Not Significant to Potentially Significant	Under an unlikely loss of off-site power (LOOP) or loss of coolant accident (LOCA), the standby diesel generators could be deployed for up to an absolute maximum duration of 7 days. If this occurred then Potentially Significant effects would happen, although the probability of this occurrence is extremely low. However, assessment work is on-going and will be reported in the ES that is submitted in 2017.
Road traffic exhaust emissions	Likely	#		Not Significant	The exact nature of the future road access to the operational Moorside Site is yet to be confirmed. It is considered unlikely that Sellafield Road would carry significant amounts of traffic. The access strategy to the Moorside Site is currently being developed and this will be reported in the ES that is submitted in 2017.

Receptor and summary of predicted effects	Probability	Sensitivity/value of receptor	Magnitude of change	Significance of effect	Rationale
Exhaust emissions from marine vessels using the marine off-loading facility (MOLF)	Likely	#	Negligible to Slight	Not Significant	These receptors are distant (~3 km) from the source of the emissions to atmosphere at the MOLF and dispersion and dilution in the atmosphere would attenuate the effects. The frequency of vessel movements is expected to be low.
Residential properties in the centre of Beckermet - Nursery Road, Morass Road, Station Crescent and Braystones Road					
Exhaust emissions from standby power generation plant - commissioning phase	Likely	#	Negligible to Slight	Not Significant	Once the diesel generators are on-site, they will go through a commissioning phase. It is expected that approximately 72 hours of testing will be required for each DG, consisting of 24 hours of individual testing and 48 hours of combination testing. The expectation is that each DG will be tested individually and, as a result, there will only ever be a single DG operating at any moment in time across the three Units in this scenario. Therefore, the probability of significant air quality effects at the majority of receptors is low.
Exhaust emissions from standby power generation plant - routine testing	Likely	#	Negligible to Slight	Not Significant	Under routine operation, these standby diesel generators would operate for only 50 hours per year under weekly testing and the probability of significant air quality effects would be very low. For example, the increment to annual mean nitrogen dioxide (NO ₂) concentrations would be Negligible and Not Significant. Whilst it is theoretically possible for 50 hours' operation to give rise to exceedances of the hourly average NO ₂ AQS, the probability of this occurring is extremely low.
Exhaust emissions from standby power generation plant - abnormal operation	Unlikely	#	Slight to Moderate	Not Significant to Potentially Significant	Under an unlikely loss of off-site power (LOOP) or loss of coolant accident (LOCA), the standby diesel generators could be deployed for up to an absolute maximum duration of 7 days. If this occurred then Potentially Significant effects would happen, although the probability of this occurrence is extremely low.

Receptor and summary of predicted effects	Probability	Sensitivity/value of receptor	Magnitude of change	Significance of effect	Rationale
Road traffic exhaust emissions	Likely	#	Negligible to Slight	Not Significant	The exact nature of the future road access to the operational Moorside Site is yet to be confirmed. It is considered unlikely that significant amounts of road traffic would be routed through Beckermet. The access strategy to the Moorside Site is currently being developed and this will be reported in the ES that is submitted in 2017.
Exhaust emissions from marine vessels using the marine off-loading facility (MOLF)	Likely	#	Negligible	Not Significant	These receptors are distant (~3.2 km) from the source of the emissions to atmosphere at the MOLF and dispersion and dilution in the atmosphere would attenuate the effects. The frequency of vessel movements is expected to be low.
Residential properties in northern Beckermet - Morass Road North, Mill Lane, Lowry Close, Fleming Drive, Beck Rise, Hunter Rise, Bankfield and The Millfields					
Exhaust emissions from standby power generation plant - commissioning phase	Likely	#	Negligible to Slight	Not Significant	Once the diesel generators are on-site, they will go through a commissioning phase. It is expected that approximately 72 hours of testing will be required for each DG, consisting of 24 hours of individual testing and 48 hours of combination testing. The expectation is that each DG will be tested individually and, as a result, there will only ever be a single DG operating at any moment in time across the three Units in this scenario. Therefore, the probability of significant air quality effects at the majority of receptors is low.
Exhaust emissions from standby power generation plant - routine testing	Likely	#	Negligible to Slight	Not Significant	Under routine operation, these standby diesel generators would operate for only 50 hours per year under weekly testing and the probability of significant air quality effects would be very low. For example, the increment to annual mean nitrogen dioxide (NO ₂) concentrations would be Negligible and Not Significant. Whilst it is theoretically possible for 50 hours' operation to give rise to exceedances

Receptor and summary of predicted effects	Probability	Sensitivity/value of receptor	Magnitude of change	Significance of effect	Rationale
					of the hourly average NO ₂ AQS, the probability of this occurring is extremely low.
Exhaust emissions from standby power generation plant - abnormal operation	Unlikely	#	Slight to Moderate	Not Significant to Potentially Significant	Under an unlikely loss of off-site power (LOOP) or loss of coolant accident (LOCA), the standby diesel generators could be deployed for up to an absolute maximum duration of 7 days. If this occurred then 'Potentially Significant' effects would happen, although the probability of this occurrence is extremely low.
Road traffic exhaust emissions	Likely	#	Negligible to Slight	Not Significant	The exact nature of the future road access to the operational Moorside Site is yet to be confirmed. It is considered unlikely that significant amounts of road traffic would be routed through Beckermet. The access strategy to the Moorside Site is currently being developed and this will be reported in the ES that is submitted in 2017.
Exhaust emissions from marine vessels using the marine off-loading facility (MOLF)	Likely	#	Negligible	Not Significant	These receptors are distant (~3.2 to 3.5 km) from the source of the emissions to atmosphere at the MOLF and dispersion and dilution in the atmosphere would attenuate the effects. The frequency of vessel movements is expected to be low.
Residential properties in Braystones - Beck Close, Nethertown Road and Egremont Road					
Exhaust emissions from standby power generation plant - commissioning phase	Likely	#	Negligible to Slight	Not Significant	Once the diesel generators are on-site, they will go through a commissioning phase. It is expected that approximately 72 hours of testing will be required for each DG, consisting of 24 hours of individual testing and 48 hours of combination testing. The expectation is that each DG will be tested individually and, as a result, there will only ever be a single DG operating at any moment in time across the three Units in this scenario. Therefore, the probability of

Receptor and summary of predicted effects	Probability	Sensitivity/value of receptor	Magnitude of change	Significance of effect	Rationale
					significant air quality effects at the majority of receptors is low.
Exhaust emissions from standby power generation plant - routine testing	Likely		Negligible to Slight	Not Significant	Under routine operation, these standby diesel generators would operate for only 50 hours per year under weekly testing and the probability of significant air quality effects would be very low. For example, the increment to annual mean nitrogen dioxide (NO ₂) concentrations would be Negligible and Not Significant. Whilst it is theoretically possible for 50 hours' operation to give rise to exceedances of the hourly average NO ₂ AQS, the probability of this occurring is extremely low.
Exhaust emissions from standby power generation plant - abnormal operation	Unlikely	#	Slight to Moderate	Not Significant to Potentially Significant	Under an unlikely loss of off-site power (LOOP) or loss of coolant accident (LOCA), the standby diesel generators could be deployed for up to an absolute maximum duration of 7 days. The probability of this occurrence is extremely low.
Exhaust emissions from marine vessels using the marine off-loading facility (MOLF)	Likely	#	Slight	Not Significant	The nearest receptors in Braystones lie ~1.9 km from the MOLF and effects would be attenuated by distance.
Road traffic exhaust emissions	Likely	#	Negligible to Slight	Not Significant	The exact nature of the future road access to the operational Moorside Site is yet to be confirmed. It is considered unlikely that significant amounts of road traffic would be routed through Braystones but this will be reported on in the ES that is submitted in 2017.
Residential properties in Blackbeck - alongside the A595(T)					
Exhaust emissions from standby power generation	Likely	#	Negligible to Slight	Not Significant	Once the diesel generators are on-site, they will go through a commissioning phase. It is expected that approximately

Receptor and summary of predicted effects	Probability	Sensitivity/value of receptor	Magnitude of change	Significance of effect	Rationale
plant - commissioning phase					72 hours of testing will be required for each DG, consisting of 24 hours of individual testing and 48 hours of combination testing. The expectation is that each DG will be tested individually and, as a result, there will only ever be a single DG operating at any moment in time across the three Units in this scenario. Therefore, the probability of significant air quality effects at the majority of receptors is low.
Exhaust emissions from standby power generation plant - routine testing	Likely	#	Negligible to Slight	Not Significant	Under routine operation, these standby diesel generators would operate for only 50 hours per year under weekly testing and the probability of significant air quality effects would be very low. For example, the increment to annual mean nitrogen dioxide (NO ₂) concentrations would be Negligible and Not Significant. Whilst it is theoretically possible for 50 hours' operation to give rise to exceedances of the hourly average NO ₂ AQS, the probability of this occurring is extremely low.
Exhaust emissions from standby power generation plant - abnormal operation	Unlikely	#	Slight to Moderate	Not Significant to Potentially Significant	Under an unlikely loss of off-site power (LOOP) or loss of coolant accident (LOCA), the standby diesel generators could be deployed for up to an absolute maximum duration of 7 days. If this occurred then 'Potentially Significant' effects would happen, although the probability of this occurrence is extremely low.
Road traffic exhaust emissions	Likely	#	Slight to Moderate	Not Significant to Potentially Significant	The exact nature of the future road access to the operational Moorside Site is yet to be confirmed. However, Blackbeck receptors lie adjacent to the A595(T) and baseline NO ₂ concentrations are ~60% of the AQS. Depending upon the change in operational traffic flows in relation to the baseline, the effects could be Not Significant or Potentially Significant. This will be reported on in the ES that is submitted in 2017.

Receptor and summary of predicted effects	Probability	Sensitivity/value of receptor	Magnitude of change	Significance of effect	Rationale
Exhaust emissions from marine vessels using the marine off-loading facility (MOLF)	Likely	#	Negligible to Slight	Not Significant	Receptors in Blackbeck lie ~3.5 km from the MOLF and this distance would attenuate the effects such as to be 'Not Significant'. The frequency of vessel movements is expected to be low.
Residential properties in Calder Bridge - alongside the A595(T)					
Exhaust emissions from standby power generation plant - commissioning phase	Likely	#	Negligible to Slight	Not Significant	Once the diesel generators are on-site, they will go through a commissioning phase. It is expected that approximately 72 hours of testing will be required for each DG, consisting of 24 hours of individual testing and 48 hours of combination testing. The expectation is that each DG will be tested individually and, as a result, there will only ever be a single DG operating at any moment in time across the three Units in this scenario. Therefore, the probability of significant air quality effects at the majority of receptors is low.
Exhaust emissions from standby power generation plant - routine testing	Likely	#	Negligible to Slight	Not Significant	Under routine operation, these standby diesel generators would operate for only 50 hours per year under weekly testing and the probability of significant air quality effects would be very low. For example, the increment to annual mean nitrogen dioxide (NO ₂) concentrations would be Negligible and Not Significant. Whilst it is theoretically possible for 50 hours' operation to give rise to exceedances of the hourly average NO ₂ AQS, the probability of this occurring is extremely low.
Exhaust emissions from standby power generation plant - abnormal operation	Unlikely	#	Slight to Moderate	Not Significant to Potentially Significant	Under an unlikely loss of off-site power (LOOP) or loss of coolant accident (LOCA), the standby diesel generators could be deployed for up to an absolute maximum duration of 7 days. If this occurred then 'Potentially Significant' effects would happen, although the probability of this occurrence is extremely low.

Receptor and summary of predicted effects	Probability	Sensitivity/value of receptor	Magnitude of change	Significance of effect	Rationale
Road traffic exhaust emissions	Likely	#	Slight to Moderate	Not Significant to Potentially Significant	The exact nature of the future road access to the operational Moorside Site is yet to be confirmed. However, receptors in Calder Bridge lie adjacent to the A595(T) and baseline NO ₂ concentrations are ~50% to 75% of the AQS. Depending upon the change in operational traffic flows in relation to the baseline, the effects could be Not Significant or Potentially Significant. This will be reported on in the ES that is submitted in 2017.
Exhaust emissions from marine vessels using the marine off-loading facility (MOLF)	Likely	#	Negligible	Not Significant	Receptors in Calder Bridge lie ~3.5 km from the MOLF and this distance is considered sufficient to attenuate effects such that they would be Not Significant. The frequency of vessel movements is expected to be low.
Sella Park House Hotel, The Spinney and two semi-detached houses to north of Sella Park House Hotel					
Exhaust emissions from standby diesel generators - commissioning phase	Likely	#	Negligible to Slight	Not Significant	Once the standby diesel generators are on-site, they will go through a commissioning phase. It is expected that approximately 72 hours of testing will be required for each DG, consisting of 24 hours of individual testing and 48 hours of combination testing. The expectation is that each DG will be tested individually and, as a result, there will only ever be a single DG operating at any moment in time across the three Units in this scenario. Therefore, the probability of significant air quality effects at the majority of receptors is low.
Exhaust emissions from standby diesel generators - routine testing	Likely	#	Negligible to Slight	Not Significant	Under routine operation, these standby diesel generators would operate for only 50 hours per year under weekly testing and the probability of significant air quality effects would be very low. For example, the increment to annual mean nitrogen dioxide (NO ₂) concentrations would be Negligible and Not Significant. Whilst it is theoretically possible for 50 hours' operation to give rise to exceedances

Receptor and summary of predicted effects	Probability	Sensitivity/value of receptor	Magnitude of change	Significance of effect	Rationale
					of the hourly average NO ₂ AQS, the probability of this occurring is extremely low.
Exhaust emissions from standby diesel generators - abnormal operation	Unlikely	#	Slight to Moderate	Not Significant to Potentially Significant	Under an unlikely loss of off-site power incident (LOOP) or loss of coolant accident (LOCA), the standby diesel generators could be deployed for up to an absolute maximum duration of 7 days. If this occurred then Potentially Significant effects would happen, although the probability of this occurrence is extremely low.
Road traffic exhaust emissions	Likely	#	Negligible to Slight	Not Significant	The exact nature of the future road access to the operational Moorside Site is yet to be confirmed. These receptors lie adjacent to the southern Sellafield access road and baseline NO ₂ concentrations are well below 75% of the AQS. It is considered unlikely that there will be notable increases in traffic flow along this road in the Moorside Project operational phase. This will be reported on in the ES that is submitted in 2017.
Exhaust emissions from marine vessels using the marine off-loading facility (MOLF)	Likely	#	Negligible	Not Significant	These receptors lie ~2.4 km from the MOLF and this distance is considered sufficient to attenuate effects such that they would be Not Significant. The frequency of vessel movements is expected to be low.
SPA and SAC sites within 10 km of the Moorside Site boundary					
Exhaust emissions from standby power generation plant - commissioning phase	Likely	#	Negligible to Slight	Not Significant	Once the diesel generators are on-site, they will go through a commissioning phase. It is expected that approximately 72 hours of testing will be required for each DG, consisting of 24 hours of individual testing and 48 hours of combination testing. The expectation is that each DG will be tested individually and, as a result, there will only ever be a single DG operating at any moment in time across the three Units in this scenario. The contribution to annual

Receptor and summary of predicted effects	Probability	Sensitivity/value of receptor	Magnitude of change	Significance of effect	Rationale
					average and daily maximum NO _x concentrations and nitrogen/acid deposition would be negligible.
Exhaust emissions from standby power generation plant - routine testing	Likely	#	Negligible to Slight	Not Significant	Under routine operation, these standby diesel generators would operate for only 50 hours per year under weekly testing and the probability of significant air quality effects would be very low. The SAC within 10 km of the Moorside Site boundary includes the River Ehen, Drigg Coast and Lake District High Fells sites. The closest point in any of these to the Moorside Site is the southern end of the River Ehen SAC at Woodend, just to the south of Cleator, more than 6 km north of the Moorside Site. The contribution to annual average and daily maximum NO _x concentrations and nitrogen/acid deposition would be negligible.
Exhaust emissions from standby power generation plant - abnormal operation	Unlikely	#	Negligible to Slight	Not Significant	Under an unlikely loss of off-site power incident (LOOP) or loss of coolant accident (LOCA), the standby diesel generators could be deployed for up to an absolute maximum duration of 7 days. The probability of this occurrence is extremely low. Again, the contributions to NO _x concentrations and acid/nitrogen deposition would be negligible.
Road traffic exhaust emissions	Likely	#	Negligible to Slight	Not Significant	The exact nature of the future road access to the operational Moorside Site is subject to on-going design and modelling. This will be reported on in the ES that is submitted in 2017.
Exhaust emissions from marine vessels using the marine off-loading facility (MOLF)	Likely	#	Negligible	Not Significant	The closest of these receptors lies ~7 km from the MOLF and this distance is considered sufficient to attenuate effects such that they would be Not Significant. The frequency of vessel movements is expected to be low.

Receptor and summary of predicted effects	Probability	Sensitivity/value of receptor	Magnitude of change	Significance of effect	Rationale
SSSI, county wildlife sites and ancient woodland within 2 km of the Moorside Site boundary					
Exhaust emissions from standby diesel generators - commissioning phase	Likely	#	Negligible to Slight	Not Significant	Once the standby diesel generators are on-site, they will go through a commissioning phase. It is expected that approximately 72 hours of testing will be required for each DG, consisting of 24 hours of individual testing and 48 hours of combination testing. The expectation is that each DG will be tested individually and, as a result, there will only ever be a single DG operating at any moment in time across the three Units in this scenario. The contribution to annual average and daily maximum NOx concentrations and nitrogen/acid deposition would be negligible.
Exhaust emissions from standby diesel generators - routine testing	Likely	#	Negligible to Slight	Not Significant to Potentially Significant	Under routine operation, these standby diesel generators would operate for only 50 hours per year under weekly testing and, therefore, the probability of significant air quality effects would be very low. The contribution to annual average concentrations and nitrogen/acid deposition would be negligible at these receptors. This will be reported on in the ES that is submitted in 2017.
Exhaust emissions from standby diesel generators - abnormal operation	Unlikely	#	Slight to Moderate	Not Significant to Potentially Significant	Under an unlikely loss of off-site power incident (LOOP) or loss of coolant accident (LOCA), the standby diesel generators could be deployed for up to an absolute maximum duration of 7 days. If this occurred then 'Potentially Significant' effects would happen, although the probability of this occurrence is extremely low. Again, the contributions to NOx concentrations and acid/nitrogen deposition will be negligible, but this is subject to on-going assessment. This will be reported on in the ES that is submitted in 2017.

Receptor and summary of predicted effects	Probability	Sensitivity/value of receptor	Magnitude of change	Significance of effect	Rationale
Road traffic exhaust emissions	Likely	#	Negligible to Slight	Not Significant	The exact nature of the future road access to the operational Moorside Site is subject to on-going design and modelling. This will be reported on in the ES that is submitted in 2017.
Exhaust emissions from marine vessels using the marine off-loading facility (MOLF)	Likely	#	Negligible	Not Significant	The closest receptors lie within 1 km of the MOLF. However, the frequency of vessel movements is considered to give rise to effects that would be 'Not Significant'.
Roadside receptors along the A595(T) to the north and south of the Moorside site and along the A5086 (Except Calder Bridge and Blackbeck - see above) in New Mill, Thornhill, Egremont, Bigrigg, Whitehaven, Cleator, Cleator Moor					
Road traffic exhaust emissions	Likely	#	Negligible to Slight	Not Significant	The varying existing baseline air quality levels at receptors within a 400 m corridor centred upon these main roads means that, subject to the amount of the additional traffic generated by the Moorside Project, Potentially Significant effects could arise in Whitehaven, where air quality levels are >75% of the AQS. However, assessment work is on-going. This will be reported on in the ES that is submitted in 2017.
Rail-side receptors along the Cumbria Coast rail line to the north and south of the Moorside Site, from the Port of Workington in the north to Barrow-in-Furness in the south					
Exhaust emissions from diesel motive units	Likely	#	Negligible to Slight	Not Significant	The exact number of rail movements associated with the operation phase is not yet confirmed. This will be reported on in the ES that is submitted in 2017.
Roadside receptors along the A595(T) to the north and south of the Moorside site and along the A5086 (Except Calder Bridge and Blackbeck - see above) in New Mill, Thornhill, Egremont, Bigrigg, Whitehaven, Cleator, Cleator Moor					
Road traffic exhaust emissions	Likely	#	Negligible to Slight	Not Significant	The varying existing baseline air quality levels at receptors within a 400 m corridor centred upon these main roads

Receptor and summary of predicted effects	Probability	Sensitivity/value of receptor	Magnitude of change	Significance of effect	Rationale
					means that, subject to the amount of the additional traffic generated by the Moorside Project, Potentially Significant effects could arise in Whitehaven, where air quality levels are >75% of the AQS. However, assessment work is on-going. This will be reported on in the ES that is submitted in 2017.
Exhaust emissions from marine vessels using the marine off-loading facility (MOLF)	Likely	#	Negligible	Not Significant	The closest receptors would be those in Braystones (Lantern Moss and Tarnside Caravan Parks and properties on Braystones Beach adjacent to the rail line. However, these would be sufficiently distant (~1 km) from vessel operations for emissions to disperse. In addition, the number of vessel movements is not considered to be sufficient to generate discernible air quality effects.

No receptor sensitivity assigned - already accounted for in setting of air quality standards & Limit Values.

Development at the Accommodation and Additional Sites

Construction

6.8.45 The preliminary assessment of predicted residual effects for air quality during the construction period has been evaluated based on previous air quality assessment experience of similar projects, as well as any site specific information received to date, including the use of each site, the scope of work and the locations of receptors. Once more detailed information on plant equipment and working areas is available, the predicted residual effects associated with each emission source can be refined. The effects of emissions from road traffic have been initially assessed using professional judgement based on past experience and the locations of relevant receptors in relation to the likely primary routes to and from the Accommodation Sites. At the present time traffic data is not available, however it is expected that this will be received in April 2016, with which traffic modelling will be undertaken if appropriate. Predicted residual effects would be updated at that time, if required.

Operation

6.8.46 The predicted residual effects during the operational period are associated with road traffic emissions, as well as emissions from heating plant associated with the Accommodation Sites, and emissions from diesel locomotives at the Corkickle to Mirehouse Railway Site and the St. Bees Railway Site. These effects have been initially assessed using professional judgement based on past experience and the locations of relevant receptors in relation to the areas within the red line boundary. Assessment of other sites, i.e., Port of Workington and fresh water supplies, will be included in the ES in 2017.

6.8.47 **Table 6.18** contains the relevant assessments.

Table 6.18 Corkickle Development: Summary of predicted residual air quality effects

Receptor and summary of predicted effects	Probability	Sensitivity/value of receptor	Magnitude of change	Significance of effect	Rationale
Construction					
Residential receptors in Esk Avenue, Calder Avenue, Pow Avenue, Irt Avenue and Ehen Avenue					
Fugitive dust emissions from earthmoving and construction activities	Likely	Medium	Slight to Moderate	Potentially Significant	These receptors lie within 100 m of the eastern extent of the Corkickle Site and within 200 m of the centre of the Corkickle Site. With incorporated mitigation, there could still be the potential for Significant effects to occur. This will be reported on in the ES that is submitted in 2017.
Exhaust emissions from non-road mobile machinery (NRMM) activity during earthmoving and construction activities	Likely	#	Negligible to Slight	Not Significant	Although the exact extent of the plant and equipment to be deployed on the Corkickle Site is in the process of being confirmed, it is considered unlikely that this could be sufficient to generate Significant effects.
Road traffic exhaust emissions	Likely	#	Negligible	Not Significant	Road traffic accessing the Corkickle Site during construction would travel along Coach Road and the A595(T), relatively remote from these receptors.
Residential receptors in Station Road & The Gardens and St Begh's Church and school					
Fugitive dust emissions from earthmoving and construction activities	Likely	Medium	Slight to Moderate	Potentially Significant	These receptors lie immediately to the north-east, within 100 /200 m of the Corkickle Site boundary. Although a range of environmental measures are proposed to minimise the effects, these still have the potential to be Significant, subject to detailed assessment of the development proposals, and other factors such as weather conditions. This will be reported on in the ES that is submitted in 2017.
Exhaust emissions from non-road mobile	Likely	#	Negligible to Slight	Not Significant	Although the exact extent of the plant and equipment to be deployed on the Corkickle Site is in the process of being

Receptor and summary of predicted effects	Probability	Sensitivity/value of receptor	Magnitude of change	Significance of effect	Rationale
machinery (NRMM) activity during earthmoving and construction activities					confirmed, it is considered unlikely that this could be sufficient to generate Significant effects.
Road traffic exhaust emissions	Likely	#	Negligible to Slight	Not Significant	Road traffic accessing the Corkickle Site during construction would travel along Coach Road, relatively close to these receptors, and the A595(T).
Residential receptors in Meadow View					
Fugitive dust emissions from earthmoving and construction activities	Likely	Medium	Slight to Moderate	Potentially Significant	These receptors lie immediately to the west, within 100 m of the Corkickle Site boundary. Although a range of environmental measures are proposed to minimise the effects, these still have the potential to be Significant, subject to detailed assessment of the development proposals, and other factors such as weather conditions. This will be reported on in the ES that is submitted in 2017.
Exhaust emissions from non-road mobile machinery (NRMM) activity during earthmoving and construction activities	Likely	#	Negligible to Slight	Not Significant	Although the exact extent of the plant and equipment to be deployed on the Corkickle Site is in the process of being confirmed, it is considered unlikely that this could be sufficient to generate Significant effects.
Road traffic exhaust emissions	Likely	#	Negligible to Slight	Not Significant	Road traffic accessing the Corkickle Site during construction would travel along Coach Road, relatively remote from these receptors, and the A595(T).
Residential receptors and a primary school in Monkway Brow					
Fugitive dust emissions from earthmoving and construction activities	Likely	Medium	Slight to Moderate	Potentially Significant	These receptors lie immediately to the west, within 200 m of the Corkickle Site boundary. Although a range of environmental measures are proposed to minimise the effects, these still have the potential to be Significant,

Receptor and summary of predicted effects	Probability	Sensitivity/value of receptor	Magnitude of change	Significance of effect	Rationale
					subject to detailed assessment of the development proposals, and other factors such as weather conditions. This will be reported on in the ES that is submitted in 2017.
Exhaust emissions from non-road mobile machinery (NRMM) activity during earthmoving and construction activities	Likely	#	Negligible to Slight	Not Significant	Although the exact extent of the plant and equipment to be deployed on the site is in the process of being confirmed, it is considered unlikely that this could be sufficient to generate Significant effects.
Road traffic exhaust emissions	Likely	#	Negligible to Slight	Not Significant	Road traffic accessing the Corkickle Site during construction would travel along Coach Road, relatively remote from these receptors, and the A595(T).
Residential receptors - 1 & 2 Steel House and Ellisons Place					
Fugitive dust emissions from earthmoving and construction activities	Likely	Medium	Slight to Moderate	Potentially Significant	These receptors lie immediately to the north and west, within 100 and 200 m of the Corkickle Site boundary. Although a range of environmental measures are proposed to minimise the effects, these still have the potential to be Significant, subject to detailed assessment of the development proposals, and other factors such as weather conditions. This will be reported on in the ES that is submitted in 2017.
Exhaust emissions from non-road mobile machinery (NRMM) activity during earthmoving and construction activities	Likely	#	Negligible to Slight	Not Significant	Although the exact extent of the plant and equipment to be deployed on the site is in the process of being confirmed, it is considered unlikely that this could be sufficient to generate Significant effects.
Road traffic exhaust emissions	Likely	#	Negligible to Slight	Not Significant	Road traffic accessing the Corkickle Site during construction would travel along Coach Road, relatively close to these receptors, and the A595(T).

Receptor and summary of predicted effects	Probability	Sensitivity/value of receptor	Magnitude of change	Significance of effect	Rationale
Operation					
All above receptors					
Road traffic exhaust emissions	Likely	#	Negligible to Slight	Not Significant	The accommodation site is located close to Corkickle railway station and this is the intended preferred mode of transport for workers to and from the Moorside Site. Road vehicle movements associated with worker travel to and from the accommodation site are in the process of being identified. This will be reported on in the ES that is submitted in 2017.
Heating plant emissions	Likely	#	Negligible to Slight	Not Significant	The nature of the heating systems is in the process of being confirmed. If a site-based combustion process is used, properly-designed and sited flue stacks will minimise local air quality effects. This will be reported on in the ES that is submitted in 2017.

Table 6.19 Mirehouse Development: Summary of predicted residual air quality effects

Receptor and summary of predicted effects	Probability	Sensitivity/value of receptor	Magnitude of change	Significance of effect	Rationale
Construction					
West Cumbria Hospital					
Fugitive dust emissions from earthmoving and construction activities	Likely	High	Slight to Moderate	Potentially Significant	This receptor lies to the north-east, within 200 m, of the eastern portion of the Mirehouse Site boundary. Although a range of environmental measures are proposed to minimise the effects, these still have the potential to be Significant, subject to detailed assessment of the development proposals, and other factors such as weather conditions. This will be reported on in the ES that is submitted in 2017.
Exhaust emissions from non-road mobile machinery (NRMM) activity during earthmoving and construction activities	Likely	#	Negligible to Slight	Not Significant	Although the exact extent of the plant and equipment to be deployed on the site is in the process of being confirmed, it is considered unlikely that this could be sufficient to generate Significant effects.
Road traffic exhaust emissions	Likely	#	Negligible to Slight	Not Significant	Road traffic would access the eastern portion of the Mirehouse Site from the A595(T) and therefore any air quality effects would be Not Significant.
Residential receptors - Cardewlee and houses in Rutland Avenue					
Fugitive dust emissions from earthmoving and construction activities	Likely	Medium	Slight to Moderate	Potentially Significant	These receptors lie immediately to the west and north-west, within 100 and 200 m, of the eastern portion of the Mirehouse Site boundary. Although a range of environmental measures are proposed to minimise the effects, these still have the potential to be Significant, subject to detailed assessment of the development proposals, and other factors such as weather conditions. This will be reported on in the ES that is submitted in 2017.

Receptor and summary of predicted effects	Probability	Sensitivity/value of receptor	Magnitude of change	Significance of effect	Rationale
Exhaust emissions from non-road mobile machinery (NRMM) activity during earthmoving and construction activities	Likely	#	Negligible to Slight	Not Significant	Although the exact extent of the plant and equipment to be deployed on the Mirehouse Site is in the process of being confirmed, it is considered unlikely that this could be sufficient to generate Significant effects.
Road traffic exhaust emissions	Likely	#	Negligible to Slight	Not Significant	Road traffic would access the eastern portion of the Mirehouse Site from the A595(T) and there would be no Significant air quality effects.
Residential receptors in Mirehouse Road, Yewbarrow Close, Kirkstone Road, Gable Road, Chapel Close, Dent Road, Bow Fell Road, Link Road, Stanley View, Melbreak Close, Skiddaw Road and Borrowdale Road					
Fugitive dust emissions from earthmoving and construction activities	Likely	Medium	Slight to Moderate	Potentially Significant	These receptors lie immediately to the north, within 100 and 200 m, along the western portion of the Mirehouse Site boundary. Although a range of environmental measures are proposed to minimise the effects, these still have the potential to be Significant, subject to detailed assessment of the development proposals, and other factors such as weather conditions. This will be reported on in the ES that is submitted in 2017.
Exhaust emissions from non-road mobile machinery (NRMM) activity during earthmoving and construction activities	Likely	#	Negligible to Slight	Not Significant	Although the exact extent of the plant and equipment to be deployed on the Mirehouse Site is in the process of being confirmed, it is considered unlikely that this could be sufficient to generate Significant effects.
Road traffic exhaust emissions	Likely	#	Negligible to Slight	Not Significant	Road traffic would access the western portion of the Mirehouse Site from the A595(T) and Mirehouse Road and it is considered that therefore any air quality effects would be Not Significant.

Receptor and summary of predicted effects	Probability	Sensitivity/value of receptor	Magnitude of change	Significance of effect	Rationale
Bank House and The Cottage					
Fugitive dust emissions from earthmoving and construction activities	Likely	Medium	Slight to Moderate	Potentially Significant	These receptors lie immediately to the north, within 100 and 200 m, of the western portion of the Mirehouse Site boundary. Although a range of environmental measures are proposed to minimise the effects, these still have the potential to be Significant, subject to detailed assessment of the development proposals, and other factors such as weather conditions. This will be reported on in the ES that is submitted in 2017.
Exhaust emissions from non-road mobile machinery (NRMM) activity during earthmoving and construction activities	Likely	#	Negligible to Slight	Not Significant	Although the exact extent of the plant and equipment to be deployed on the Mirehouse Site is in the process of being confirmed, it is considered unlikely that this could be sufficient to generate Significant effects.
Road traffic exhaust emissions	Likely	#	Negligible to Slight	Not Significant	Road traffic would access the western portion of the Mirehouse Site from the A595(T) and Mirehouse Road and it is considered that therefore any air quality effects would be Not Significant.
Low Hall					
Fugitive dust emissions from earthmoving and construction activities	Likely	Medium	Slight to Moderate	Potentially Significant	This receptor lies within the western portion of the Mirehouse Site, although a range of environmental measures are proposed to minimise the effects, these still have the potential to be Significant, subject to detailed assessment of the development proposals, and other factors such as weather conditions. This will be reported on in the ES that is submitted in 2017.

Receptor and summary of predicted effects	Probability	Sensitivity/value of receptor	Magnitude of change	Significance of effect	Rationale
Exhaust emissions from non-road mobile machinery (NRMM) activity during earthmoving and construction activities	Likely	#	Negligible to Slight	Not Significant	Although the exact extent of the plant and equipment to be deployed on the Mirehouse Site is in the process of being confirmed, it is considered unlikely that this could be sufficient to generate Significant effects.
Road traffic exhaust emissions	Likely	#	Negligible	Not Significant	This receptor is remote from the A595(T) and Mirehouse Road.
Lake View					
Fugitive dust emissions from earthmoving and construction activities	Likely	Medium	Slight to Moderate	Potentially Significant	This receptor lies 200 m south-west of the western portion of the Mirehouse Site. Although a range of environmental measures are proposed to minimise the effects, these still have the potential to be Significant, subject to detailed assessment of the development proposals, and other factors such as weather conditions. This will be reported on in the ES that is submitted in 2017.
Exhaust emissions from non-road mobile machinery (NRMM) activity during earthmoving and construction activities	Likely	#	Negligible to Slight	Not Significant	Although the exact extent of the plant and equipment to be deployed on the Mirehouse Site is in the process of being confirmed, it is considered unlikely that this could be sufficient to generate Significant effects.
Road traffic exhaust emissions	Likely	#	Negligible	Not Significant	This receptor is remote from the A595(T) and Mirehouse Road.

Receptor and summary of predicted effects	Probability	Sensitivity/value of receptor	Magnitude of change	Significance of effect	Rationale
High Low Hall, Home Meadow and Lane End					
Fugitive dust emissions from earthmoving and construction activities	Likely	Medium	Slight to Moderate	Potentially Significant	These receptors lie to the east of the eastern portion of the Mirehouse Site, within 100 m and 200 m of the site boundary. Although a range of environmental measures are proposed to minimise the effects, these still have the potential to be Significant, subject to detailed assessment of the development proposals, and other factors such as weather conditions. This will be reported on in the ES that is submitted in 2017.
Exhaust emissions from non-road mobile machinery (NRMM) activity during earthmoving and construction activities	Likely	#	Negligible to Slight	Not Significant	Although the exact extent of the plant and equipment to be deployed on the Mirehouse Site is in the process of being confirmed, it is considered unlikely that this could be sufficient to generate Significant effects.
Road traffic exhaust emissions	Likely	#	Negligible	Not Significant	These receptors are remote from the A595(T) and Mirehouse Road.
Receptors close to new rail station - The Cottage, properties in Stanley View and Melbreak Close					
Fugitive dust emissions from earthmoving and construction activities	Likely	Medium	Slight to Moderate	Potentially Significant	Although a range of environmental measures are proposed to minimise the effects, these still have the potential to be Significant, subject to detailed assessment of the development proposals, and other factors such as weather conditions. This will be reported on in the ES that is submitted in 2017.
Exhaust emissions from non-road mobile machinery (NRMM) activity during earthmoving and construction activities	Likely	#	Negligible to Slight	Not Significant	Although the exact extent of the plant and equipment to be deployed on the Mirehouse Site is in the process of being confirmed, it is considered unlikely that this could be sufficient to generate Significant effects.

Receptor and summary of predicted effects	Probability	Sensitivity/value of receptor	Magnitude of change	Significance of effect	Rationale
Operation					
All above receptors					
Road traffic exhaust emissions	Likely	#	Negligible to Slight	Not Significant	The Mirehouse Site is located close to the proposed Mirehouse railway station and this is the intended preferred mode of transport for workers to and from the Moorside Site. Road vehicle movements associated with worker travel to and from the Mirehouse Site are in the process of being identified. This will be reported on in the ES that is submitted in 2017.
Heating plant emissions	Likely	#	Negligible to Slight	Not Significant	The nature of the heating systems has yet to be confirmed. If a site-based combustion process is used, properly-designed and sited flue stacks will minimise local air quality effects. This will be reported on in the ES that is submitted in 2017.
Receptors close to new rail station - The Cottage, properties in Stanley View and Melbreak Close					
Diesel rail power unit emissions	Likely	#	Negligible to Slight	Not Significant	Emissions from idling and departing power units could be noticeable at properties within 100 metres of the station but are unlikely to have Significant effects upon air quality.

Table 6.20 Egremont Development: Summary of predicted air quality residual effects

Receptor and summary of predicted effects	Probability	Sensitivity/value of receptor	Magnitude of change	Significance of effect	Rationale
Construction					
Residential receptors in Dent Road, Thorny Road, The Knoll, High Road, Wodow Road and The Crescent					
Fugitive dust emissions from earthmoving and construction activities	Likely	Medium	Slight to Moderate	Potentially Significant	These receptors lie within 200 m of the southern edge of the Egremont Site. Although a range of environmental measures are proposed to minimise the effects, these still have the potential to be Significant, subject to detailed assessment of the development proposals, and other factors such as weather conditions. This will be reported on in the ES that is submitted in 2017.
Exhaust emissions from non-road mobile machinery (NRMM) activity during earthmoving and construction activities	Likely	#	Negligible to Slight	Not Significant	Although the exact extent of the plant and equipment to be deployed on the Egremont Site is in the process of being confirmed, it is considered unlikely that this could be sufficient to generate Significant effects.
Road traffic exhaust emissions	Likely	#	Negligible to Moderate	Potentially Significant	Receptors in High Road and Thorntrees Drive lie immediately to the west of the A595(T), which will be the main road route for construction traffic. However, the main site access point is to the north, off Vale View in Egremont. Baseline air quality levels are ~86% of the AQS. This will be reported on in the ES that is submitted in 2017.
Residential receptors on the north side of Vale View					
Fugitive dust emissions from earthmoving and construction activities	Likely	Medium	Slight to Moderate	Potentially Significant	These receptors lie within 200 m of the northern edge of the Egremont Site. Although a range of environmental measures are proposed to minimise the effects, these still have the potential to be Significant, subject to detailed assessment of the development proposals, and other

Receptor and summary of predicted effects	Probability	Sensitivity/value of receptor	Magnitude of change	Significance of effect	Rationale
					factors such as weather conditions. This will be reported on in the ES that is submitted in 2017.
Exhaust emissions from non-road mobile machinery (NRMM) activity during earthmoving and construction activities	Likely	#	Negligible to Slight	Not Significant	Although the exact extent of the plant and equipment to be deployed on the Egremont Site is in the process of being confirmed, it is considered unlikely that this could be sufficient to generate Significant effects.
Road traffic exhaust emissions	Likely	#	Negligible to Moderate	Potentially Significant	Baseline air quality levels are ~86% of the AQS, but construction traffic would not drive past the houses in Vale View. This will be reported on in the ES that is submitted in 2017.
Residential receptors in Scurgil to the east of the A595(T)					
Fugitive dust emissions from earthmoving and construction activities	Likely	Medium	Slight to Moderate	Potentially Significant	These receptors lie within 200 m of the eastern edge of the Egremont Site. Although a range of environmental measures are proposed to minimise the effects, these still have the potential to be Significant, subject to detailed assessment of the development proposals, and other factors such as weather conditions. This will be reported on in the ES that is submitted in 2017.
Exhaust emissions from non-road mobile machinery (NRMM) activity during earthmoving and construction activities	Likely	#	Negligible to Slight	Not Significant	Although the exact extent of the plant and equipment to be deployed on the Egremont Site is in the process of being confirmed, it is considered unlikely that this could be sufficient to generate Significant effects.
Road traffic exhaust emissions	Likely	#	Negligible to Slight	Not Significant	With the separation distances between these receptors and the A595(T) roundabout, it is considered that effects would be Not Significant.

Receptor and summary of predicted effects	Probability	Sensitivity/value of receptor	Magnitude of change	Significance of effect	Rationale
Parkhead Inn					
Fugitive dust emissions from earthmoving and construction activities	Likely	Medium	Slight to Moderate	Potentially Significant	This receptor lies within 200 m of the eastern edge of the Egremont Site, to the east of the A595(T). Although a range of environmental measures are proposed to minimise the effects, these still have the potential to be Significant, subject to detailed assessment of the development proposals, and other factors such as weather conditions. This will be reported on in the ES that is submitted in 2017.
Exhaust emissions from non-road mobile machinery (NRMM) activity during earthmoving and construction activities	Likely	#	Negligible to Slight	Not Significant	Although the exact extent of the plant and equipment to be deployed on the Egremont Site is in the process of being confirmed, it is considered unlikely that this could be sufficient to generate Significant effects.
Road traffic exhaust emissions	Likely	#	Negligible to Slight	Not Significant	This receptor lies less than 100 m to the east of the A595(T) and baseline air quality levels are less than 75% of the AQS. Traffic flow increases are unlikely to generate a significant effect, as these are considered sufficiently low not to increase the nitrogen dioxide concentrations to above 75% of the AQS.
Operation					
All above receptors					
Road traffic exhaust emissions	Likely	#	Negligible to Slight	Not Significant	The preferred mode of transport for workers to and from the Moorside Site from this accommodation area will be by coach. Road vehicle movements associated with worker travel to and from the Egremont Site are in the process of being identified. This will be reported on in the ES that is submitted in 2017.

Receptor and summary of predicted effects	Probability	Sensitivity/value of receptor	Magnitude of change	Significance of effect	Rationale
Heating plant emissions	Likely	#	Negligible to Slight	Not Significant	The nature of the heating systems has yet to be confirmed. If a site-based combustion process is used, properly-designed and sited flue stacks will minimise local air quality effects. This will be reported on in the ES that is submitted in 2017.

No receptor sensitivity assigned - already accounted for in setting of air quality standards & Limit Values.

Table 6.21 Corkickle to Mirehouse Railway: Summary of predicted air quality residual effects

Receptor and summary of predicted effects	Probability	Sensitivity/value of receptor	Magnitude of change	Significance of effect	Rationale
Construction					
Residential receptors in southern part of Esk Avenue, Snebro Road and Scafell Close					
Fugitive dust emissions from earthmoving and construction activities	Likely	Medium	Slight to Moderate	Potentially Significant	These receptors lie within 200 m (and a few within 100 m) of the eastern edge of the Corkickle to Mirehouse Railway Site. Although a range of environmental measures are proposed to minimise the effects, these still have the potential to be Significant, subject to detailed assessment of the development proposals, and other factors such as weather conditions. This will be reported on in the ES that is submitted in 2017.
Exhaust emissions from non-road mobile machinery (NRMM) activity during earthmoving and construction activities	Likely	#	Negligible to Slight	Not Significant	Although the exact extent of the plant and equipment to be deployed is in the process of being confirmed, it is considered unlikely that this could be sufficient to generate Significant effects, given the limited scope and extent of the works.
Road traffic exhaust emissions	Likely	#	Negligible to Slight	Not Significant	The extent of road traffic movements associated with the construction phase of the Railway is in the process of being confirmed. This will be reported on in the ES that is submitted in 2017.
Residential receptors in Whinlater Road, Grisedale Close, Bowfell Road and Stanley View					
Fugitive dust emissions from earthmoving and construction activities	Likely	Medium	Slight to Moderate	Potentially Significant	These receptors lie within 200 m (and a few within 100 m) of the eastern edge of the Corkickle to Mirehouse Railway Site. Although a range of environmental measures are proposed to minimise the effects, these still have the potential to be Significant, subject to detailed assessment of the development proposals, and other factors such as

Receptor and summary of predicted effects	Probability	Sensitivity/value of receptor	Magnitude of change	Significance of effect	Rationale
					weather conditions. This will be reported on in the ES that is submitted in 2017.
Exhaust emissions from non-road mobile machinery (NRMM) activity during earthmoving and construction activities	Likely	#	Negligible to Slight	Not Significant	Although the exact extent of the plant and equipment to be deployed on the site is in the process of being confirmed, it is considered unlikely that this could be sufficient to generate Significant effects, given the limited scope and extent of the works.
Road traffic exhaust emissions	Likely	#	Negligible to Slight	Not Significant	The extent of road traffic movements associated with the construction phase of the Railway is in the process of being confirmed. This will be reported on in the ES that is submitted in 2017.
Residential receptors in Burnmoor Avenue, Uldale Road, Croasdale Avenue, Seathwaite Avenue, Newlands Avenue, Wasdale Close, Latrigg Road, The Oval, Meadow Road, Melbreak Close and The Cottage					
Fugitive dust emissions from earthmoving and construction activities	Likely	Medium	Slight to Moderate	Potentially Significant	These receptors lie within 200 metres (and a few within 100 metres) of the western edge of the Corkickle to Mirehouse Railway Site. Although a range of environmental measures are proposed to minimise the effects, these still have the potential to be Significant, subject to detailed assessment of the development proposals, and other factors such as weather conditions. This will be reported on in the ES that is submitted in 2017.
Exhaust emissions from non-road mobile machinery (NRMM) activity during earthmoving and construction activities	Likely	#	Negligible to Slight	Not Significant	Although the exact extent of the plant and equipment to be deployed is in the process of being confirmed, it is considered unlikely that this could be sufficient to generate Significant effects, given the limited scope and extent of the works.
Road traffic exhaust emissions	Likely	#	Negligible to Slight	Not Significant	The extent of road traffic movements associated with the construction phase of the Railway is in the process of being

Receptor and summary of predicted effects	Probability	Sensitivity/value of receptor	Magnitude of change	Significance of effect	Rationale
					confirmed. This will be reported on in the ES that is submitted in 2017.
Valley Primary School and Nursery					
Fugitive dust emissions from earthmoving and construction activities	Likely	Medium	Slight to Moderate	Potentially Significant	This receptor lies within 100 m of the eastern edge of the Corkickle to Mirehouse Railway Site. Although a range of environmental measures are proposed to minimise the effects, these still have the potential to be Significant, subject to detailed assessment of the development proposals, and other factors such as weather conditions. This will be reported on in the ES that is submitted in 2017.
Exhaust emissions from non-road mobile machinery (NRMM) activity during earthmoving and construction activities	Likely	#	Negligible to Slight	Not Significant	Although the exact extent of the plant and equipment to be deployed on the site is in the process of being confirmed, it is considered unlikely that this could be sufficient to generate Significant effects, given the limited scope and extent of the works.
Road traffic exhaust emissions	Likely	#	Negligible to Slight	Not Significant	The extent of road traffic movements associated with the construction phase of the Railway is in the process of being confirmed. This will be reported on in the ES that is submitted in 2017.
Operation					
All the above receptors					
Exhaust emissions from additional diesel rail power units on the rail line	Likely	#	Negligible to Slight	Not Significant	These receptors are relatively close to the railway line, and a full assessment of likely effects will be reported in the ES to be submitted in 2017, when the exact increases in rail movements will be known.

Table 6.22 St. Bees Railway : Summary of predicted residual effects

Receptor and summary of predicted effects	Probability	Sensitivity/value of receptor	Magnitude of change	Significance of effect	Rationale
Construction					
Platform 9, houses in Station Road and on northern part of Main Street					
Fugitive dust emissions from earthmoving and construction activities	Likely	Medium	Slight	Not Significant	These receptors lie within 30 m of the centre of the St. Bees Railway Site. However, the scope and extent of the works are relatively limited and therefore it is considered that the effects would be Not Significant.
Exhaust emissions from non-road mobile machinery (NRMM) activity during earthmoving and construction activities	Likely	#	Negligible to Slight	Not Significant	Although the exact extent of the plant and equipment to be deployed is in the process of being confirmed, it is considered unlikely that this could be sufficient to generate Significant effects, given the limited scope and extent of the works.
Road traffic exhaust emissions	Likely	#	Negligible to Slight	Not Significant	The extent of road traffic movements associated with the construction phase of the Railway is in the process of being confirmed. This will be reported on in the ES that is submitted in 2017.
Residential receptors in Seacroft Drive					
Fugitive dust emissions from earthmoving and construction activities	Likely	Medium	Slight	Not Significant	These receptors lie within 30 to 140 m of the centre of the St. Bees Railway Site. However, the scope and extent of the works are relatively limited and therefore it is considered that they would be Not Significant.
Exhaust emissions from non-road mobile machinery (NRMM) activity during earthmoving and construction activities	Likely	#	Negligible to Slight	Not Significant	Although the exact extent of the plant and equipment to be deployed is in the process of being confirmed, it is considered unlikely that this could be sufficient to generate Significant effects, given the limited scope and extent of the works.

Receptor and summary of predicted effects	Probability	Sensitivity/value of receptor	Magnitude of change	Significance of effect	Rationale
Road traffic exhaust emissions	Likely	#	Negligible to Slight	Not Significant	The extent of road traffic movements associated with the construction phase of the Railway is in the process of being confirmed. This will be reported on in the ES that is submitted in 2017.
Beckside					
Fugitive dust emissions from earthmoving and construction activities	Likely	Medium	Slight to Moderate	Not Significant	This receptor lies within 20 m of the centre of the St. Bees Railway Site. However, the scope and extent of the works are relatively limited and therefore it is considered that they would be Not Significant.
Exhaust emissions from non-road mobile machinery (NRMM) activity during earthmoving and construction activities	Likely	#	Negligible to Slight	Not Significant	Although the exact extent of the plant and equipment to be deployed is in the process of being confirmed, it is considered unlikely that this could be sufficient to generate Significant effects, given the limited scope and extent of the works.
Road traffic exhaust emissions	Likely	#	Negligible to Slight	Not Significant	The extent of road traffic movements associated with the construction phase of the Railway is in the process of being confirmed. This will be reported on in the ES that is submitted in 2017.
Operation					
All the above receptors					
Exhaust emissions from additional diesel rail power units on the rail line	Likely	#	Negligible to Slight	Not Significant	This will be reported in the ES to be submitted in 2017 when the extent of additional rail traffic movements are known.

Table 6.23 Highway Improvements: Summary of predicted residual effects**

Receptor and summary of predicted effects	Probability	Sensitivity/ value of receptor	Magnitude of change	Significance of effect	Rationale
A66 Ramsay Brow Improvement					
Construction					
Residential receptors on the south side of the A66					
Fugitive dust emissions from earthmoving and construction activities	Likely	Medium	Negligible to Slight	Not Significant	These receptors are located on the roadside. The environmental measures outlined in Table 6.1 are anticipated to minimise the effects, to the extent that these will be Not Significant.
Exhaust emissions from non-road mobile machinery (NRMM) activity during earthmoving and construction activities	Likely	#	Negligible to Slight	Not Significant	Although the exact extent of the plant and equipment to be deployed is in the process of being confirmed, it is considered unlikely that this could be sufficient to generate Significant effects, given the limited scope and extent of the works.
Road traffic exhaust emissions	Likely	#	Negligible to Slight	Not Significant	Road traffic movements associated with the construction of this scheme have yet to be determined. However, given that the scale of work is minor, it is considered that any effects would be Not Significant. This will be reported on in the ES that is submitted in 2017.
Operation					
Residential receptors on the south side of the A66					
Road traffic exhaust emissions	Likely	#	Negligible to Slight	Not Significant	Road traffic movements associated with the operation of this scheme have yet to be determined. However, given that the road scheme intends to improve traffic flows, it is considered

Receptor and summary of predicted effects	Probability	Sensitivity/ value of receptor	Magnitude of change	Significance of effect	Rationale
					that any effects would be Not Significant. This will be reported on in the ES that is submitted in 2017.
A596 Hall Brow Improvement					
Construction					
Residential properties along the western edge of the A596					
Fugitive dust emissions from earthmoving and construction activities	Likely	Medium	Negligible to Slight	Not Significant	These receptors are located on the roadside. The environmental measures outlined in Table 6.1 are anticipated to minimise the effects, to the extent that these will be Not Significant.
Exhaust emissions from non-road mobile machinery (NRMM) activity during earthmoving and construction activities	Likely	#	Negligible to Slight	Not Significant	Although the exact extent of the plant and equipment to be deployed is in the process of being confirmed, it is considered unlikely that this could be sufficient to generate Significant effects, given the limited scope and extent of the works.
Road traffic exhaust emissions	Likely	#	Negligible to Slight	Not Significant	Road traffic movements associated with the construction of this scheme have yet to be determined. However, given that the scale of work is minor, it is considered that any effects would be Not Significant. This will be reported on in the ES that is submitted in 2017.
Operation					
Residential properties along the western edge of the A596					
Road traffic exhaust emissions	Likely	#	Negligible to Slight	Not Significant	Road traffic movements associated with the operation of this scheme have yet to be determined. However, given that the road scheme intends to improve traffic flows, it is considered

Receptor and summary of predicted effects	Probability	Sensitivity/ value of receptor	Magnitude of change	Significance of effect	Rationale
					that any effects would be Not Significant. This will be reported on in the ES that is submitted in 2017.
A595 Parton Junctions Improvement					
Construction					
Residential receptors in Seven Acres and Briscoe Crescent					
Fugitive dust emissions from earthmoving and construction activities	Likely	Medium	Negligible to Slight	Not Significant	These receptors are located on the roadside. The environmental measures outlined in Table 6.1 are anticipated to minimise the effects, to the extent that these will be Not Significant.
Exhaust emissions from non-road mobile machinery (NRMM) activity during earthmoving and construction activities	Likely	#	Negligible to Slight	Not Significant	Although the exact extent of the plant and equipment to be deployed is in the process of being confirmed, it is considered unlikely that this could be sufficient to generate Significant effects, given the limited scope and extent of the works.
Road traffic exhaust emissions	Likely	#	Negligible to Slight	Not Significant	Road traffic movements associated with the construction of this scheme have yet to be determined. However, given that the scale of work is minor, it is considered that any effects would be Not Significant. This will be reported on in the ES that is submitted in 2017.
Operation					
Residential receptors in Seven Acres and Briscoe Crescent					
Road traffic exhaust emissions	Likely	#	Negligible to Slight	Not Significant	Road traffic movements associated with the operation of this facility have yet to be determined. However, given that the road scheme intends to improve traffic flows, it is considered

Receptor and summary of predicted effects	Probability	Sensitivity/ value of receptor	Magnitude of change	Significance of effect	Rationale
					that any effects would be Not Significant. This will be reported on in the ES that is submitted in 2017.
Coach Road/Station Road Improvement					
Construction					
Residential receptors in Coach Road and Station Road					
Fugitive dust emissions from earthmoving and construction activities	Likely	Medium	Negligible to Slight	Not Significant	These receptors are located on the roadside. The environmental measures outlined in Table 6.1 are anticipated to minimise the effects, to the extent that these will be Not Significant.
Exhaust emissions from non-road mobile machinery (NRMM) activity during earthmoving and construction activities	Likely	#	Negligible to Slight	Not Significant	Although the exact extent of the plant and equipment to be deployed is in the process of being confirmed, it is considered unlikely that this could be sufficient to generate Significant effects, given the limited scope and extent of the works.
Road traffic exhaust emissions	Likely	#	Negligible to Slight	Not Significant	Road traffic movements associated with the construction of this scheme have yet to be determined. However, given that the scale of work is minor, it is considered that any effects would be Not Significant. This will be reported on in the ES that is submitted in 2017.
Operation					
Residential receptors in Coach Road and Station Road					
Road traffic exhaust emissions	Likely	#	Negligible to Slight	Not Significant	Road traffic movements associated with the operation of this scheme have yet to be determined. However, given that the road scheme intends to improve traffic flows, it is considered

Receptor and summary of predicted effects	Probability	Sensitivity/ value of receptor	Magnitude of change	Significance of effect	Rationale
					that any effects would be Not Significant. This will be reported on in the ES that is submitted in 2017.
Coach Road/B5435 Improvement					
Construction					
Residential receptors in Ellison Place					
Fugitive dust emissions from earthmoving and construction activities	Likely	Medium	Negligible to Slight	Not Significant	These receptors are located on the roadside. The environmental measures outlined in Table 6.1 are anticipated to minimise the effects, to the extent that these will be Not Significant.
Exhaust emissions from non-road mobile machinery (NRMM) activity during earthmoving and construction activities	Likely	#	Negligible to Slight	Not Significant	Although the exact extent of the plant and equipment to be deployed is in the process of being confirmed, it is considered unlikely that this could be sufficient to generate Significant effects, given the limited scope and extent of the works.
Road traffic exhaust emissions	Likely	#	Negligible to Slight	Not Significant	Road traffic movements associated with the construction of this scheme have yet to be determined. However, given that the scale of work is minor, it is considered that any effects would be Not Significant. This will be reported on in the ES that is submitted in 2017.
Operation					
Residential receptors in Ellison Place					
Road traffic exhaust emissions	Likely	#	Negligible to Slight	Not Significant	Road traffic movements associated with the operation of this scheme have yet to be determined. However, given that the road scheme intends to improve traffic flows, it is considered

Receptor and summary of predicted effects	Probability	Sensitivity/ value of receptor	Magnitude of change	Significance of effect	Rationale
					that any effects would be Not Significant. . This will be reported on in the ES that is submitted in 2017.
A595/A5094 Inkerman Terrace/B5295 Ribton Moorside Improvement					
Construction					
Residential receptors on the A595, the A5094 and in Hensingham Road					
Fugitive dust emissions from earthmoving and construction activities	Likely	Medium	Negligible to Slight	Not Significant	These receptors are located on the roadside. The environmental measures outlined in Table 6.1 are anticipated to minimise the effects, to the extent that these will be Not Significant.
Exhaust emissions from non-road mobile machinery (NRMM) activity during earthmoving and construction activities	Likely	#	Negligible to Slight	Not Significant	Although the exact extent of the plant and equipment to be deployed is in the process of being confirmed, it is considered unlikely that this could be sufficient to generate Significant effects, given the limited scope and extent of the works.
Road traffic exhaust emissions	Likely	#	Negligible to Slight	Not Significant	Road traffic movements associated with the construction of this scheme have yet to be determined. However, given that the scale of work is minor, it is considered that any effects would be Not Significant. This will be reported on in the ES that is submitted in 2017.
Operation					
Residential receptors on the A595, the A5094 and in Hensingham Road					
Road traffic exhaust emissions	Likely	#	Negligible to Slight	Not Significant	Road traffic movements associated with the operation of this scheme have yet to be determined. However, given that the road scheme intends to improve traffic flows, it is considered

Receptor and summary of predicted effects	Probability	Sensitivity/ value of receptor	Magnitude of change	Significance of effect	Rationale
					that any effects would be Not Significant. This will be reported on in the ES that is submitted in 2017.
A595/B5295 Homewood Road Roundabout Improvement					
Construction					
Residential receptors in Suffolk Close					
Fugitive dust emissions from earthmoving and construction activities	Likely	Medium	Negligible to Slight	Not Significant	These receptors are located on the roadside. The environmental measures outlined in Table 6.1 are anticipated to minimise the effects, to the extent that these will be Not Significant.
Exhaust emissions from non-road mobile machinery (NRMM) activity during earthmoving and construction activities	Likely	#	Negligible to Slight	Not Significant	Although the exact extent of the plant and equipment to be deployed is in the process of being confirmed, it is considered unlikely that this could be sufficient to generate Significant effects, given the limited scope and extent of the works.
Road traffic exhaust emissions	Likely	#	Negligible to Slight	Not Significant	Road traffic movements associated with the construction of this scheme have yet to be determined. However, given that the scale of work is minor, it is considered that any effects would be Not Significant. This will be reported on in the ES that is submitted in 2017.
Operation					
Residential receptors in Suffolk Close					
Road traffic exhaust emissions	Likely	#	Negligible to Slight	Not Significant	Road traffic movements associated with the operation of this scheme have yet to be determined. However, given that the road scheme intends to improve traffic flows, it is considered

Receptor and summary of predicted effects	Probability	Sensitivity/ value of receptor	Magnitude of change	Significance of effect	Rationale
					that any effects would be Not Significant. This will be reported on in the ES that is submitted in 2017.
A595/Moor Row Improvement					
Construction					
Residential receptors on the A595 including Scalegill Hall and Beech House					
Fugitive dust emissions from earthmoving and construction activities	Likely	Medium	Negligible to Slight	Not Significant	These receptors are located on the roadside. The environmental measures outlined in Table 6.1 are anticipated to minimise the effects, to the extent that these will be Not Significant.
Exhaust emissions from non-road mobile machinery (NRMM) activity during earthmoving and construction activities	Likely	#	Negligible to Slight	Not Significant	Although the exact extent of the plant and equipment to be deployed is in the process of being confirmed, it is considered unlikely that this could be sufficient to generate Significant effects, given the limited scope and extent of the works.
Road traffic exhaust emissions	Likely	#	Negligible to Slight	Not Significant	Road traffic movements associated with the construction of this scheme have yet to be determined. However, given that the scale of work is minor, it is considered that any effects would be Not Significant. This will be reported on in the ES that is submitted in 2017.
Operation					
Residential receptors on the A595 including Scalegill Hall and Beech House					
Road traffic exhaust emissions	Likely	#	Negligible to Slight	Not Significant	Road traffic movements associated with the operation of this scheme have yet to be determined. However, given that the road scheme intends to improve traffic flows, it is considered

Receptor and summary of predicted effects	Probability	Sensitivity/ value of receptor	Magnitude of change	Significance of effect	Rationale
					that any effects would be Not Significant. This will be reported on in the ES that is submitted in 2017.
A595/The Crescent Thornhill Improvement					
Construction					
Residential receptors on High Road					
Fugitive dust emissions from earthmoving and construction activities	Likely	Medium	Negligible to Slight	Not Significant	These receptors are located on the roadside. The environmental measures outlined in Table 6.1 are anticipated to minimise the effects, to the extent that these will be Not Significant.
Exhaust emissions from non-road mobile machinery (NRMM) activity during earthmoving and construction activities	Likely	#	Negligible to Slight	Not Significant	Although the exact extent of the plant and equipment to be deployed is in the process of being confirmed, it is considered unlikely that this could be sufficient to generate Significant effects, given the limited scope and extent of the works.
Road traffic exhaust emissions	Likely	#	Negligible to Slight	Not Significant	Road traffic movements associated with the construction of this scheme have yet to be determined. However, given that the scale of work is minor, it is considered that any effects would be Not Significant. This will be reported on in the ES that is submitted in 2017.
Operation					
Residential receptors on High Road					
Road traffic exhaust emissions	Likely	#	Negligible to Slight	Not Significant	Road traffic movements associated with the operation of this scheme have yet to be determined. However, given that the road scheme intends to improve traffic flows, it is considered

Receptor and summary of predicted effects	Probability	Sensitivity/ value of receptor	Magnitude of change	Significance of effect	Rationale
					that any effects would be Not Significant. This will be reported on in the ES that is submitted in 2017.

No receptor sensitivity assigned - already accounted for in setting of air quality standards & Limit Values.

**The road improvement scheme proposed for the A66/A595 roundabout has been omitted from the residual effects analysis, since there are no receptors in close proximity to this location.

6.9 Preliminary assessment of the Moorside Project as a whole

- 6.9.1 An assessment of the Moorside Project as a whole will be included in the ES. For the purposes of this PEIR, a preliminary assessment of the Moorside Site, Accommodation Sites, the Corkicle to Mirehouse Railway Site, the St. Bees Railway Site and the Highway Improvements *together* has been undertaken. The assessment has looked at whether there would be any additional, "*accumulated effects*" on specific environmental receptors. The ES will include all other sites that comprise the Additional Sites in this assessment once the data becomes available.
- 6.9.2 In terms of the spatial scope of the assessment of accumulated effects, the principles have been set out in **Section 3.4** and summarised in **Table 3.8**. With respect to air quality, the Zones of Influence (Zol) around each Moorside Project Site vary, with the Moorside Site being subject to a number of different Zols (see **Figures 6.1 & 6.2**) because of the nature and scale of the development. For example, emissions to atmosphere from activities on the Moorside Site during site preparation and clearance, construction and operation have a Zol extending to 5 km from the Moorside Site boundary, but for ecological receptors when the Moorside Site is in operation the Zol extends out to 10 km for sites with a European designation, but only 2 km for locally-designated sites and sites of special scientific interest (SSSI). For road traffic air quality effects, DMRB guidance states a distance of 200 m from the road centreline for both human and ecological receptors.
- 6.9.3 The following paragraphs contain a preliminary high-level accumulated effects assessment of the air quality effects arising from the whole Moorside Project, taking into account the preliminary residual effects assessments for the individual project elements contained in **Tables 6.17 to 6.23** above. Whilst the potential for whole project effects to arise has been identified, at this preliminary stage it has not been possible to determine the magnitude of change and it is therefore not possible to rule out the potential for these effects to be significant. Consequently such effects are described as being '*potentially significant*', although the use of the term '*potentially significant*' should not be taken to imply that significant effects are considered likely to occur. The rationale for these conclusions is provided in the following paragraphs and a summary of this analysis is set out in **Table 6.24** below. Full detailed assessments will be carried out subsequently and reported in the ES that is due to be submitted in 2017.
- 6.9.4 Firstly, it is evident that whole Moorside Project effects will only be significant during the construction phase. During operation of the Moorside Power Station, the only potential for whole project effects to arise is when exhaust emissions from operation of the standby diesel generators could generate effects at receptors, which are also subject to effects from vehicle exhaust emissions from employees and visitors accessing the Moorside Power Station. The probability of these effects occurring in combination is extremely remote, for the following reasons:

- Under normal operation of the Moorside Power Station, the standby diesel generators only operate when they are routinely tested for 1 hour every three months. There would also be a once per annum 24-hour run period for each standby diesel generator. That equates to 28 hours of operation for each generator or a combined total operation of 168 hours per annum;
- Peak hour road traffic flows would only occur 2 or 3 times per day, depending upon shift patterns; and
- The numbers of receptors that would be affected are limited and will depend critically upon the wind direction prevailing at the time of standby diesel generator operation simultaneously with peak hour road traffic.

6.9.5 In relation to the assessment of the Moorside Project effects as a whole during the construction phase, it is firstly the case that, as far as emissions to atmosphere from activity on the individual sites themselves are concerned (namely, fugitive dust and exhaust emissions from construction vehicles and plant operating on the sites), there will be no significant effects from the following site combinations, because of simple physical separation:

- The Moorside Site, the Mirehouse Site and the Corkickle Site; and
- The Moorside Site, the St. Bees Railway Site and the Corkickle to Mirehouse Railway Site.

6.9.6 However, there could be whole project effects from fugitive dust and construction plant emissions upon identified receptors (see **Figures 6.8, 6.9, and 6.13**) near to the Corkickle Site; the Corkickle to Mirehouse Railway Site; the Mirehouse Site, together with the Coach Road/B5435 Improvement Site and the Coach Road/Station Road Improvement Site.

6.9.7 Also throughout the construction phase accumulated effects are likely as a result of increased road traffic flows on the local roads and the A595(T). This would affect those identified receptors in the vicinity of roads serving all of the Moorside Project Sites. In addition, receptors identified alongside the Cumbria Coast railway line will experience accumulated effects as a result of increased rail traffic movements associated with construction of all the Moorside Project Sites.

Table 6.24 Summary of predicted residual air quality effects - whole project, construction phase fugitive dust and construction plant exhaust emissions

Receptors	Whole Project accumulated effects/Significance of effects*							
	Moorside Site	Corkickle Site	Mirehouse Site	Egremont Site	Corkickle to Mirehouse Railway Site	Station Road/Coach Road Junction Improvement Site	Coach Road/B5435 Road Junction Improvement Site	Whole Moorside Project
Receptors within 5 km of the Moorside Site	Potentially Significant	No effects	No effects	Potentially Significant	No effects	No effects	No effects	Potentially Significant
Receptors within 500 m of the Corkickle Site	No effects	Potentially Significant	No effects	No effects	Potentially Significant	Potentially Significant	Potentially Significant	Potentially Significant
Receptors within 500 m of the Mirehouse Site	No effects	No effects	Potentially Significant	No effects	Potentially Significant	No effects	No effects	Potentially Significant
Receptors within 500 m of the Corkickle to Mirehouse Railway Site and the northern and southern ends.	No effects	Potentially Significant	Potentially Significant	No effects	Potentially Significant	Potentially Significant	Potentially Significant	Potentially Significant
Receptors within 200 m of the Station Road/ Coach Road Site	No effects	Potentially Significant	No effects	No effects	Potentially Significant	Potentially Significant	Potentially Significant	Potentially Significant
Receptors within 200 m of the Coach Road/B5435 Site	No effects	Potentially Significant	No effects	No effects	Potentially Significant	Potentially Significant	Potentially Significant	Potentially Significant

* The preliminary effects summarised under each Moorside Project Site by receptor are subject to change for individual receptors and groups of receptors as more project design information becomes available and will be reported in the ES that is to be submitted in 2017.

6.10 Preliminary assessment of cumulative effects with other developments

Scope of the assessment

- 6.10.1 As outlined in **Section 3.4**, an exercise has been undertaken to determine which other (non-Moorside) developments should be considered in the context of their ability to result in cumulative adverse environmental effects with the Moorside Project.
- 6.10.2 Of the other developments described in **Section 3.4**, listed in **Table 3.4** and considered in the context of **Table 3.9** in terms of air quality effects, it is considered appropriate at this stage not to consider the following projects on the basis that they are located outwith the Zones of Influence of the Moorside Project Sites:
- 5. West Cumbria Water Supply Pipeline (United Utilities);
 - 6. Walney Extension Wind Farm (Dong Energy);
 - 7. Barrow-in-Furness Site (BAE Systems);
 - 8. Ulverston Biopharmaceutical Manufacturing Facility (GSK);
 - 9. Heysham New Nuclear Power Station (EDF Energy); and
 - 10. Tidal Lagoon West Cumbria (Tidal Lagoon Power).
- 6.10.3 However, it should be noted that the situation with respect to the above sites will be kept under review during the preparation of the EIA, pending the availability of information from the respective developers regarding their own air quality Zols.
- 6.10.4 Of the remaining other developments considered in **Table 3.9**, these are briefly discussed in the context of their likely interaction with respect to air quality in the sub-sections below.

1. Sellafield Site Decommissioning (Sellafield Ltd/Nuclear Decommissioning Authority)

- 6.10.5 The Sellafield Site Decommissioning project has the potential to interact with the Moorside Project, particularly with respect to the Moorside Site itself. This would notably occur during the construction phase of the Moorside Site, when potentially significant cumulative effects could occur with respect to fugitive dust from earthworks and exhaust emissions from road traffic.

2. North West Coast Connections (NWCC), West Cumbria (National Grid)

- 6.10.6 The North West Coast Connections Project is intimately related to the Moorside Project, since it would provide the connection to the UK national electricity grid for the power generated and therefore the local works would partially take place within the boundary of the Moorside Site.

- 6.10.7 It is therefore anticipated that there would be potentially significant cumulative air quality effects generated during the construction phase of the Moorside Project, notably with respect to fugitive dust emissions; and road traffic emissions to atmosphere.

3. Whitehaven Coking Coal Project (West Cumbria Mining)

- 6.10.8 Given that the timescales for the construction of the West Cumbria Mining Project precede the construction of the Moorside Project, it is considered that it is the operational phase of the former, and notably the operation of the proposed railhead, which would be located on the south-western part of the Mirehouse Site, that has the capacity to have potentially significant cumulative air quality effects with the Moorside Project. Specifically, the type of effects would relate to fugitive dust emissions from the coal loading operations, together with emissions from rail traffic movements associated with the coal transportation. It is also understood that waste rock material from the mining and coal processing is to be transported from the proposed Marchon minehead site by road and this proposed operation could potentially lead to potentially significant cumulative effects in terms of road traffic emissions.

4. Low Level Waste Repository, Drigg (LLWR Ltd)

- 6.10.9 The extensions to the low level waste repository at Drigg would also have the potential to generate additional road traffic on the A595 (T) at the same time as the Moorside Project is under construction and during at least half of its operational years, which could be potentially significant.

6.11 Consideration of additional mitigation

- 6.11.1 At the present time, the process of identifying those receptors at which the designed-in mitigation measures may be insufficient to reduce the air quality effects to an insignificant level is still ongoing. It will be reported on in the ES that is submitted in 2017. However, some typical additional effects mitigation measures that can be implemented to further reduce effects at specific receptors are indicated below. It is possible that it will not just be air quality that is a critical effect: noise and vibration may also be critical, as proximity of receptors to the source of effects will likely be the main issue. In that case, a combined, integrated set of additional mitigation measures will be put forward for consideration.

Construction phase effects

Fugitive dust

- Application of increased localised dust suppression regimes for specific receptors during certain phases of construction:
 - increased watering;

- reduced vehicle speeds in specific areas;
- hard-surfacing and regular cleaning/compaction of haul roads, sealing of surfaces;
- Hydro-seeding and/or sealing of localised stockpile surfaces;
- provision of barriers (such as “green walls”); and
- cessation of working in exceptionally dry periods and/or under certain wind directions and conditions).

Construction plant exhaust emissions

- Use of ultra-low sulphur diesel (ULSD) to reduce emissions of SO₂ and particulates;
- Use of construction plant and vehicles that are powered by diesel engines compliant with Stage 4 exhaust emission controls (to reduce emissions of NO_x and particulates)¹⁰; and
- Use of alternative-fuelled plant and vehicles (LPG/CNG/electric-powered) at specific locations close to receptors to reduce air quality effects;

Construction phase road traffic exhaust emissions

- Ensuring road-going fleet is fully compliant with Euro 6/VI emission standards;
- Routing and scheduling of deliveries and exports to avoid sensitive receptors and times of day (e.g., “school run” times);
- Creation of localised road diversions to protect sensitive receptors; and
- Use of electric and hybrid vehicles, where possible.

Operation phase effects

6.11.2 Once in operation, effects upon air quality at sensitive receptors generated by the Moorside Project will be limited to routine testing of diesel-fuelled standby generation plant and vehicle exhaust emissions from employee and service contractor movements. It is considered unlikely that these would give rise to significant air quality effects.

¹⁰ Stage 4 emission control legislation will apply to all large plant on sale from 1 January 2014 and stage V from 2019/20. However, average life of large plant items in the UK fleet is ~11 years, so at the time of the Moorside project construction phase, there could still be some Stage III plant in the UK fleet.

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