4. Transport

4.1 Introduction

4.1.1 This chapter presents a preliminary assessment of the likely significant effects with respect to transportation arising from the Moorside Project.

4.1.2 The assessment is being undertaken in accordance with relevant guidance for undertaking transport impact assessments in the UK which is primarily provided by The Institute of Environmental Assessment (IEA) (Guidelines for the Environmental Assessment of Road Traffic, 1993) (Reference 1).

4.1.3 This chapter should be read in conjunction with the draft Transport Strategy (Reference 2), which sets out NuGen's proposed approach to transportation for the Moorside Project.

4.1.4 This Transport chapter covers all modes of transport including road, rail, marine, together with walking and cycling. The preliminary assessment takes all of these into consideration, regardless of journey purpose (for example commuting trips and leisure trips are both considered).

4.1.5 Other chapters of relevance to this Transport chapter include the following:

- **Chapter 9, Countryside Access and Recreation,** which considers off-road walking and cycling routes as well as recreational marine users;
- **Chapter 10, Socio-economics,** which considers where the workforce will travel to the site from and reside, since this will influence their transportation choices. **Chapter 10** also covers commercial fisheries; and
- **Chapters 6, Air Quality** and **Chapter 5, Noise and Vibration,** which both assess the impact from changes to traffic flows.

4.2 Limitations of the PEIR

General

4.2.1 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. In addition, modelling work is on-going for the Moorside Project. The level of detail available in this chapter of the PEIR therefore reflects this position. The Moorside Site, the Accommodation Sites, the sites for the Highway Improvements and the Railway sites, including the Moorside Project Railway, have all been considered in this chapter.

4.2.2 With respect to the decommissioning of the Moorside Project, potential effects associated with decommissioning are likely to be similar to or less than the effects arising from the construction phase. It is not anticipated that additional receptors would be affected beyond those identified for the construction phase assessment as this assessment has assumed a reasonable

worst case. It is anticipated that the decommissioning works would occupy more limited footprints than those currently assumed for construction of the relevant facilities. Subject to further design and delivery details, and for the purposes of this PEIR, a worst case scenario has been applied, i.e. it has been assumed that the effects would be the same (rather than less) as those identified for the construction phase. Decommissioning is therefore not considered further in the assessment tables below that address the construction and operational phases.

4.2.3 Emergency access and egress situations will be reported on in the Environmental Statement that is submitted as part of the DCO application in 2017, as the approach for emergencies is still being finalised with several possible options being considered in more detail. Further information on these is provided in the draft Transport Strategy.

Technical

4.2.4 The assessments of significance contained within this chapter are made in the absence of quantitative supporting analysis (e.g. highway junction modelling), as this work will continue to be progressed over the remainder of 2016. Therefore the assessments contained in this chapter rely on professional judgment. These judgements may be revised within the Environmental Statement (to be submitted as part of the application for a DCO for the Moorside Project in 2017), following more detailed analysis and refinements in engineering design.

4.2.5 The full extent and location of the marine infrastructure is yet to be finalised and, as such, the impact assessment regarding transport effects related to this infrastructure is still preliminary.

4.2.6 Additional baseline information is still being collated across the modes, particularly rail and marine which will be necessary to inform the detailed impact assessment which will be reported on in 2017.

4.2.7 This chapter has therefore been prepared based on available existing data. To that end, the chapter summarises an approach to assessing the effects of the Moorside Project on users of the transport network, and those sensitive receptors which, given their location in the study area, may experience some level of change that have the potential to result in significant effects.

4.3 Policy and legislative context

4.3.1 National Policy Statements, National Planning Policy Framework and local planning policies have been discussed, in general terms, in **Section 1.2**. The following specific planning policies have been used to inform this assessment on Transport:

- National Policy Statements:
  - Section 5.13 of the Overarching National Policy Statement for Energy EN-1 (DECC, 2011) (Reference 3) is entitled ‘Traffic and Transport’.

Paragraphs 5.13.3 to 5.13.5 of NPS EN-1 outline the following assessment policies relating to traffic and transport:

- If a project is likely to have significant transport implications, the applicant's ES (see Section 4.2) should include a transport assessment, using the NATA/WebTAG methodology stipulated in Department for Transport guidance, or any successor to such methodology. Applicants should consult the Highways Agency and Highways Authorities as appropriate on the assessment and mitigation.
- Where appropriate, the applicant should prepare a travel plan including demand management measures to mitigate transport impacts. The applicant should also provide details of proposed measures to improve access by public transport, walking and cycling, to reduce the need for parking associated with the proposal and to mitigate transport impacts.
- If additional transport infrastructure is proposed, applicants should discuss with network providers the possibility of co-funding by Government for any third-party benefits. Guidance has been issued in England which explains the circumstances where this may be possible, although the Government cannot guarantee in advance that funding will be available for any given uncommitted scheme at any specified time.

- In addition, sections 5.13.6 and 5.13.7 state:
  - A new energy NSIP may give rise to substantial impacts on the surrounding transport infrastructure and the [Secretary of State] should therefore ensure that the applicant has sought to mitigate these impacts, including during the construction phase of the development. Where the proposed mitigation measures are insufficient to reduce the impact on the transport infrastructure to acceptable levels, the [Secretary of State] should consider requirements to mitigate to acceptable levels, the [Secretary of State] should consider requirements to mitigate adverse impacts on transport networks arising from the development, as set out below. Applicants may also be willing to enter into planning obligations for funding infrastructure and otherwise mitigating adverse impacts.
  - Provided that the applicant is willing to enter into planning obligations or requirements can be imposed to mitigate transport impacts identified in the NATA/WebTAG transport assessment, with attribution of costs calculated in accordance with the Department for Transport's guidance, then development consent should not be withheld, and appropriately limited weight should be applied to residual effects on the surrounding transport infrastructure.
- Section 3.15 of National Policy Statement for Nuclear Power Generation EN-6 Volume I (DECC, 2011) (Reference 4) relates to impacts on

significant infrastructure and resources. Paragraphs 3.15.2 and 3.15.3 of NPS EN-6 state:

- Applications should demonstrate that the proposed development would not have an unacceptable adverse impact on significant infrastructure. The [Secretary of State] should take into account any local authority impact report, advice from the relevant Nuclear Regulators and relevant policy in NPSs in assessing impacts on significant infrastructure and resources.

  Additionally, the following points as set out in Volume II of NPS EN-6 (Reference 5) are noted:

- *"C7.137 Many responses noted traffic problems associated with the existing Sellafield site, which responses said creates significant strain on the road network to the site. The A595 was frequently referred to as problematic. It was suggested that there were delays on this route when there was a trial run of the evacuation plan. Other responses made specific suggestions for improvements including a trunk road link to connect the site to the main routes further across the county."*

- *"C.7.138 The Government recognises that a new nuclear power station, both in construction and operation, may have significant impacts on both local and national transport infrastructure. At Sellafield impacts may be exacerbated by the operation of the existing facilities which place a particular strain at certain times of the day. Under the NPS system, transport access arrangements can be included as associated development and therefore submitted to the IPC for consideration along with an application for development consent for a new nuclear power station. Guidance is in Section 5.13 of EN-1. Transport, flooding and emergency planning is discussed under criterion D1"*

  In particular, the Nuclear AoS identified that there may be adverse effects during the construction and decommissioning phases on regional transport networks that may already be under stress, particularly where there are clusters of potentially suitable sites for new nuclear power stations. In considering this issue the policy set out in Section 5.13 of EN-1 (Transport and Traffic impacts) applies.

- HM Government, Northern Ireland Executive, Scottish Government, Welsh Assembly Government (2011). Marine Policy Statement.

  This document is the framework for preparing Marine Plans and taking decisions affecting the marine environment.

- Department for Transport (2014).National Policy Statement for National Networks.

  Sets out the need for, and Government's policies to deliver, development of nationally significant infrastructure projects on the national road and rail networks in England.

- Department for Communities and Local Government (2012). National Planning Policy Framework, Section 4;

  This section outlines the importance of focussing on sustainable travel solutions, with significant developments being accompanied by Transport Assessments.

- Cumbria County Council (2011). 3rd Cumbria Local Transport Plan 2011 – 2026 (Reference 6).

  - This document states the objectives of the local highway authority for transportation until 2026, including ensuring effective connections between people and places, and promoting the use of sustainable travel options.

  - Chapter 4 states *"Significant improvements to the key strategic road routes through Copeland particularly the A595 are vital to the sustained development of the local economy and ensuring there is good connectivity with the rest of the UK by road. We will work with the Department for Transport and nuclear industry to secure these required improvements to the key strategic road routes as well as the Cumbria Coast rail line."*

  - *Chapter 6 states "The demands on the transport infrastructure resulting from Nuclear New Build are likely to be significant. During the construction phase issues around the movement of people, materials and reactor modules will need to be addressed to enable the development, which is seen as crucial to the economic prosperity of West Cumbria"*

- Copeland Borough Council (2013). Copeland Local Plan 2013-2028: Adopted Core Strategy and Development Management Policies

  - The Local Plan stresses the importance of supporting sustainable travel options, with a focus on sustainable travel to out of town employment destinations. Improving accessibility and transport, focussing upon transport improvements that maximise accessibility for all modes of transport but particularly by foot, cycle and public transport are noted. It also supports infrastructure upgrades and provisions such as improvements to the A595 and rail stations within the borough.

  - Policy ER1: Planning for the Nuclear Sector is of particular relevant to the Moorside Project and sets out how Copeland Borough Council will support development associated with nuclear development.

  - Finally, a Parking Strategy document is being developed which will inform acceptable parking standards for application at new developments.

- Allerdale Borough Council (2013) Allerdale Local Plan (Part 1) Pre-Submission Draft May 2013:

- The Local Plan provides guidance on the approach to Nationally Significant Infrastructure Projects for the wider area. In terms of transportation, the plan requires new developments to be required to improve accessibility and movement in the local area by supporting sustainable travel options.
- Policy S13: Energy Coast Innovation Zone states that the Council will work with partners to maximise the economic opportunities identified in the West Cumbria Economic Blueprint by supporting the Energy Coast Innovation Zone through the delivery of supporting infrastructure including roads and transport upgrades.

- Lake District National Park Authority (2010) Core Strategy including Proposals Map:
  - Policy CS12: Major Developments defines a major development as being [of relevance to the Moorside Project]) road schemes or energy supply schemes and infrastructure associated with them. These schemes would be assessed and developers expected to provide mitigation as appropriate.
  - Policy CS14: Sustainable transport solutions sets out principles for sustainable development and supports sustainable travel opportunities such as walking, cycling, public transport and water-borne transport to minimise the impact from private vehicles.

4.3.2 In addition, the following guidance has informed the assessment:

- Highways England (HE, formerly the Highways Agency) (Various). The Design Manual for Roads and Bridges (DMRB) (Volumes 5, 11 (Reference 7) and 13). DMRB provides a reference manual compiling all relevant standards, advice notes and guidance on other published documents relating to the design, assessment and operation of Highway England's network (motorways and trunk roads). In the absence of other adopted guidance, many local highway authorities adopt DMRB as the default standard. Volume 11 specifically sets out guidance on the environmental assessment of highways projects on the trunk road network.
- Department for Transport (2013). Transport Analysis and Guidance (WebTAG). Outlines guidance and good practice for transport and traffic modelling.
- Institution of Highways and Transportation (IHT) (2007) (Reference 8). Guidelines for Traffic Impact Assessment (archived October 2014, and replaced by Transport Evidence Bases in Plan Making, Department for Transport). Whilst this document has been archived, the new document (Evidence Bases in Plan Making) requires the relevant Local Authority to have its own guidance in place to substitute the previous guidance. Until this has been undertaken for all local authorities relevant to the Moorside Project, NuGen proposes to refer where relevant and appropriate to the 2007 guidelines.

- Department for Transport and Department for Communities and Local Government (2007). Manual for Streets. Guidance on the Design of Residential Streets. Guidance contained within this document, such as visibility sight lines, is also applicable to other development scenarios.
- Chartered Institute of Highways and Transportation (2010). Manual for Streets 2. Guidance on the wider application of the principles of design of residential streets.
- Department for Transport et al. (2014). Street Design for All. Provides an update of national advice and good practice in relation to the design of residential streets.
- Network Rail (various). Route Utilisation Strategies. Northern (2011), Lancashire and Cumbria (2008), Network RUS and Freight RUS. Sets out the longer term vision for improvements across the rail network.
- Network Rail (2013) Strategic Business Plans 2014–19. A Better Railway for a Better Britain. This document sets out Network Rail's aspirations for maintaining, extending and improving the rail assets in England.
- Highways England Annual Safety Reports (various). These reports will support the process of a review and identification of areas on the existing highway networks that are subject to accidents and incidents.
- British Standard (BS) 6349-1-1 2013 Planning and Design for Port Operations. This BS provides recommendations and guidance on general criteria relevant to the planning, design, construction and maintenance of structures and facilities set in the maritime environment.
- BS 6349-2:2010 Maritime works. Code of Practice for Planning and Design for Operations. Code of practice for the design of quay walls, jetties and dolphins.
- PIANC (Permanent International Association of Navigation Congresses) Report WG 34 Seismic Design Guidelines for Port Structures. May be required if subject to confirmation of British Geological Survey, Seismic Hazard.

4.4 Data gathering methodology

Study area

4.4.1 In line with NPS policy, NuGen's draft Transport Strategy (NuGen, 2016) is to utilise rail and sea as the preferred modes of transport for both materials and workers wherever possible, thereby minimising the impact upon the road network. For any residual trips which have to occur on the road network, mitigation measures will be implemented to try and manage and reduce the significant adverse effects associated with this as much as possible.

4.4.2 In addition to this, any adverse impacts upon the rail network or marine users as a result of the construction or operation of MPS will be assessed for significant adverse effects and mitigation suggested as appropriate.

4.4.3 The study area in terms of highways has been refined (from that identified in the Moorside Environmental Impact Assessment Scoping Report, Amec Foster Wheeler 2015 (Reference 9)) to include the following primary corridors, which are routes on the network that are trunk roads or considered most likely to be impacted upon by the Moorside Project due to movements of people and freight, and form a continuous route between two primary destinations, such as the Moorside Site and the Accommodation Sites:

- A66 from Junction 40 with the M6 to Workington for the A596;
- A595 from the A66 south as far as Gosforth;
- A5086 from the A595 to the A66 to the south of Cockermouth to the A595 at Egremont;
- A596 from the Port of Workington southwards to the A595;
- A595 from junction 44 with the M6 to the junction with the A66, west of Cockermouth;
- Mirehouse Road from the A595 to serve the Mirehouse Site;
- A5049 Inkerman Terrace (from the A595) and Coach Road in Whitehaven to serve the Corkickle Site; and
- Vale View from the A595 to serve the Egremont Site.

4.4.4 These routes have been refined in conjunction with Highways England and Cumbria County Council. **Figure 4.1** and **Figure 4.2** denote the study area, displaying these primary routes as well as identifying any secondary routes (see 4.4.6 below) and the Cumbrian Coast Line railway. Given their lengths, these routes will be assessed in sections, not full corridor lengths. However, it should be noted that the boundaries of each of these sections are in the process of being determined and confirmed with statutory consultees.

4.4.5 The sections will be identified based on areas of similar characterisation, and preliminary discussions with statutory consultees that have been undertaken to determine the approach. In addition, preliminary details have begun to be collected on the corridors to inform the sectioning process.

4.4.6 Other local routes are also likely to be affected, such as those that connect to the Accommodation Sites or Additional Sites from these primary routes, which will be defined as secondary routes and will represent routes which are in addition to the primary routes, but may be of a lower route hierarchy (e.g. B roads) and not be continuous. The requirement to assess these routes will be known following a review of the outputs from the highway modelling exercise and the development of routing strategies (being developed by NuGen to manage where movements are concentrated on the highway network) as routings on the network will be clearer.

4.4.7 In summary the A595 will form the primary highway route that will connect the M6 at junction 40 to the Moorside Project Sites via the A66:

- Corkickle Site – Highway access for all movements will be via the A595/A5094 Inkerman Terrace/B5295 Ribton Moorside Improvement Site, and Coach Road. The site access will be located towards the western end of Coach Road.
- Mirehouse Site – Highway access for all movements will be from the A595/Mirehouse Road traffic signal controlled junction. The site access will be from the south side of Mirehouse Road. Additional highway access will be provided via the A595/West Lakes Science Park traffic signal controlled junction.
- Egremont Site – Highway access for all movements will be via the roundabout at A595/Vale View, located south of Egremont. Access to the site will be from the existing Vale View cul de sac, which currently provides access to a small number of private properties.
- Moorside Site – Highway movements will be via the A595/Blackbeck roundabout. Vehicle movements will primarily be from the north. The existing access to the Sellafield Site will become a dedicated access to the Moorside Site.
- A new access will be constructed to provide an alternative public access route to Sellafield (including the Rail Station). Access will be via a new junction from the A595, the exact location of which is yet to be determined.

4.4.8 With regard to the Port of Workington, it would connect to the highway network to support the project via the following:

- From the M6 via the A595/A66/A596 (Stainburn Road/Ramsey Brow/Hall Brow), skirting the east of Workington before crossing the River Derwent to Northside Road, and onwards to the port.
- Access towards the Moorside Project Sites would be via the Northside Bridge and the A597 to the A595/Distington by-pass.

4.4.9 In addition to the above routes secondary movements are likely to be generated associated with:

- local trips to and from the Accommodation Sites accessing nearby services; and
- routing of construction worker coaches to service local resident work force demand.

4.4.10 For rail, the main scope of the assessment will be the Cumbrian Coast Line railway from Carlisle to Barrow-in-Furness. Impacts upon other lines, such as the West Coast Mainline will be assessed appropriately once further information on worker and freight origins is known. Information is being collated with regards to the existing use of the Cumbrian Coast Line railway to establish a baseline to assess change against.

4.4.11 For walking and cycling, regardless of journey purpose, all footways adjacent to the primary corridors (and connecting highway routes from these) between the Moorside Site and the Accommodation Sites will be considered as part of the assessment, as well as any dedicated on-road cycle lanes. Off-road facilities and Public Rights of Way (PRoW) are covered in **Chapter 9**.

4.4.12 For transport effects on marine receptors the assessment will focus on impacts upon shipping lanes and connectivity with the port(s) identified for use. Information is being reviewed with regards to the existing operations at ports across Cumbria and further afield to understand the current use at each, including vessel frequencies, types and handling tonnages. Effects on recreational marine users are also assessed in **Chapter 9**.

Desk study

4.4.13 A number of data sources and documents have been identified which will give a better understanding of transportation across the study area, in addition to the documents listed in **Section 4.3**. The following additional publications and data sources have been reviewed to date:

- TRADs data – traffic flow information relating to the Highways England network. This has been used to supplement traffic flow survey data collected specifically for this project
- Parking Guidelines in Cumbria, Cumbria County Council, 2002. This has been used to understand parking standards applicable for new developments to guide acceptable parking provisions at the Accommodation Sites.

4.4.14 Two traffic models are being used to assess the impact on the highway of development for all Moorside Project Sites. These include:

- West Cumbria Transport Model: Owned and operated by Cumbria County Council, this covers the highway network west of the M6 which encompasses the full study area; and
- Micro-simulation model of the A595: This has been developed by Mott MacDonald and covers a section of the A595 running from the junction with A5094 Inkerman Terrace in the north and Gosforth in the south.

4.4.15 These traffic models will be supplemented by localised junction modelling as required; particularly around the Accommodation Sites' access and egress points and the sites for the Highway Improvements.

4.4.16 The analysis of the outputs from the modelling will inform an understanding of where adverse effects upon the highway network will be experienced in order to guide the identification and location of mitigation.

4.4.17 The highway improvements, which are currently being considered to provide mitigation for the road transportation related impacts of the Moorside Project are located as follows:

- 1. A66/A595 Roundabout, Cockermouth Improvement Site;

- 2. A66 Ramsay Brow, Workington Improvement Site;
- 3. A596 Hall Brow, Workington Improvement Site;
- 4. A595 Parton Junctions Improvement Site;
- 5a. Coach Road/Station Road Improvement Site;
- 5b. Coach Road/B5345 Improvement Site;
- 6. A595/A5094 Inkerman Terrace/B5295 Ribton Moorside, Whitehaven Improvement Site;
- 7. A595/Homewood Road Roundabout, Whitehaven Improvement Site;
- 8. A595/Moor Row Improvement Site;
- 9. A595/The Crescent, Thornhill Improvement Site.

4.4.18 Further information regarding these Highway Improvements is presented in **Chapter 2**. These locations are being reviewed in more detail as the modelling progresses and the list may change as the work is refined.

4.4.19 In conjunction with Cumbria County Council and Highways England, areas along the primary and secondary highway routes have been identified, which are locations along or adjacent to the highway network within which different thresholds for change (to those stated below in 4.5.7 and 4.5.8) will apply in recognition of sensitivities in the area, such as residential clusters. This is explained further in **Section 4.5** with these sensitive areas also shown in **Figure 4.1 and Figure 4.2**.

4.4.20 Additionally for highways, existing pavement and structure condition data is being reviewed to understand the current condition of the highway and associated structures (such as bridges). This information will be used as a baseline to assess further change against.

4.4.21 From a rail and marine perspective, baseline information is being captured based on the current operation of the railway and its stations as well as notable ports to ensure that any impacts, associated with the Moorside Project upon the associated infrastructure for rail and marine, can be appropriated assessed.

Survey work

4.4.22 Two sets of road traffic surveys (June 2015, December 2015) have been undertaken to capture traffic flow and speed information at locations across West Cumbria (the locations of these surveys can be seen in **Figures 4.3** to **4.5**).

4.4.23 The first set of data was focussed mainly on capturing locations along the A595 to inform the micro-simulation model and understand movements along some of the key corridors listed above.

4.4.24 The second set of surveys focussed on routes in and around the Moorside Project Sites in order to capture movements on local roads, as well as fill any

data gaps which were not captured during the June 2015 surveys (the locations of these surveys can be seen in **Figures 4.3** to **4.5**). Whilst inclement weather was experienced around the time of the surveys, the results from the surveys suggest the data collection was not adversely affected and therefore the datasets are considered valid.

4.4.25 No survey work has been undertaken with regards to rail or marine, with none currently identified as being required. Desktop information will be used to inform this work.

Consultation

4.4.26 Further to the details outlined in **Chapter 3** regarding the consultation that has taken place to date, it should be noted that consultation feedback received from the following organisations has been used to inform the scope of the assessment. This consultation has included the responses to the regular meetings and discussions held on the Survey and Monitoring Plans, quarterly update meetings and EIA Scoping Report:

- Highways England (HE);
- Cumbria County Council (CCC);
- Copeland Borough Council (CBC);
- Allerdale Borough Council (ABC);
- Sellafield Ltd;
- Marine Management Organisation (MMO);
- Lake District National Park (LDNP);
- Friends of the Lake District; and
- Cumbria Constabulary.

4.4.27 **Table 4.1** provides details of the main issues which have been raised during these consultations, and a response on how they are being considered in the EIA process.

Table 4.1 Consultation responses received

Issue raised	Consultees	Response
More information on the baseline position for all modes to ensure a robust assessment of the Moorside Project impact against.	CCC, CBC, MMO, ABC, HE, LDNP	The collation of baseline information is on-going across all modes with raw data collection informing the highway position, supplemented (for all modes) by desktop data analysis to inform a baseline position with regards to capacity and current operation. This will be reported on in the ES to be submitted in 2017.
A requirement to understand the full transport demand for the Moorside Project to ensure the assessment of impact is valid.	CCC, CBC, MMO, ABC, HE, LDNP	Work is ongoing to ensure the likely impact of the Moorside Project is adequately assessed. This includes testing a range of scenarios and applying sensitivity tests to capture changes in the impact across the phases of the project. For example, the scenarios consider both the construction and operational phases and assess the impact upon the highway if (as an example) rail is not available as anticipated. This will be reported on in the ES to be submitted in 2017.
Ensuring appropriate mitigation is being considered and that the timing of the mitigation is suitable and complementary to the timescales of the project.	CCC, HE	As part of assessing the impact from the Moorside Project, mitigation is being identified, such as the works identified at sites for the Highway Improvements, which will be required to be implemented prior to the Moorside Project impact occurring. The phasing of the proposed mitigation measures is being carefully considered in the context of the overarching construction schedule for the Moorside Project. This will be reported on in the ES to be submitted in 2017.
Further information needs to be provided on the Transport Strategy and how workers and freight will be transported. This should include how the movements will be managed and how any adverse effects, such as parking around the Accommodation Sites, will be addressed.	CCC, HE, CBC, ABC	A Transport Assessment (TA) and supporting Travel Plan is being produced. This will set out the necessary detailed mitigation measures in detail to address the significant adverse effects arising from the Moorside Project. The TA will include a number of Transport Implementation Strategies, such as for parking, walking & cycling, public transport and rail. These will set out how the Moorside Project will utilise the various modes of

Issue raised	Consultees	Response
		transport for local worker and freight movements, and how the impacts from these movements will be managed and mitigated. For example the walking & cycling or public transport strategies will assess how workers can travel to/from the Accommodation Sites both for work (to connect onto rail or coach shuttle services) and also for leisure trips to access amenities in surrounding urban areas, such as Whitehaven and Egremont. This will be reported on in the ES to be submitted in 2017.

4.5 Scope of the assessment

Potential receptors

4.5.1 A desktop review has been undertaken of potential receptors which fall within a 100 m of the carriageway boundary of the primary routes as identified in **Section 4.4** (in accordance with DMRB Volume 11, Section 3) as well as those secondary routes which directly serve an Accommodate Site, for example Mirehouse Road for the Mirehouse Site. Furthermore, whilst secondary routes have been proposed and described in this PEIR, the final routes will be considered in detail within the ES, once it has been confirmed that the Moorside Project will be required to utilise them.

4.5.2 These include the following types:

- **Receptor 1 – Sensitive Receptors** such as schools, tourist, retail and leisure sites, hospitals, employment sites and residential properties located within 100 m of highway routes in Cumbria to be used to serve the Moorside Project Sites. The locations of these receptors are shown in **Figures 4.6 to 4.12.**
- **Receptor 2 – Network User Receptors** to include drivers, motorcyclists, public transport (users and operators), pedestrians, cyclists, equestrians, marine users (including users of Ports). This covers all network users, regardless of their journey purpose.
- **Receptor 3 – Transport infrastructure** to include the highway network (roads and footways), cycle routes, public rights of way, the rail network and marine.

4.5.3 As noted earlier in **Section 4.4**, the highway network within the Transport Infrastructure receptor group is being assessed in sections rather than as one complete asset in its entirety. This is because it is likely that a range of sensitivity levels might apply across these sections dependent upon their characteristics, location and use. These sections are still to be determined. Similarly, for the Sensitive Receptors and the Network User Receptors, the types of receptors covered (as denoted above) may also vary in their level of sensitivity, with this being determined following establishment of the detailed baseline conditions associated with each.

4.5.4 The location of the sensitive receptors is shown in **Figures 4.6 to 4.12**. Any sensitive receptors, which are located along other highway routes that are not part of the primary corridors will be identified as part of the full assessment of these routes once they become known.

4.5.5 Sensitive receptors around the railway have not been identified or assessed in this chapter as the effects from increased use of the railway will be more appropriate to cover in other chapters of the ES as they will be associated with changes in **Chapter 6 (Air Quality)** and **Chapter 5 (Noise and Vibration),** for example.

Spatial and temporal scope

Spatial scope

4.5.6 The potential impacts upon Sensitive Receptors (such as journey delay, severance, capacity) is considered to be limited to the zone located within a 100 m buffer along the primary routes on the highway network, as these routes are those most likely to be used to deliver construction materials to the Moorside Project Sites. This approach is in accordance with DMRB Volume 11, Section 3. Other local routes, which are also affected by deliveries of materials to the Moorside Project Sites, will also be subjected to this buffer assessment, as they become apparent.

4.5.7 Through consultation with Highways England and Cumbria County Council, as the highway authorities, sensitive areas have been identified on the highway network. These areas which cover the locations where there is a record of political or community concern about the impacts of road traffic in terms of journey delay, pedestrian severance and congestion. These locations are shown in **Figure 4.1 and Figure 4.2**. For these areas, any change to the volume or nature of traffic movement on the route, even if apparently negligible, should be assessed in more detail to identify whether appropriate mitigation is required. This is in addition to the 10% change noted in the IEA guidelines for sensitive areas.

4.5.8 Thresholds for non-sensitive locations for weekday peaks on the network have been agreed, below which the impact is deemed to be negligible and no further assessment is required. The thresholds are:

- any junctions which have less than 15% capacity remaining;
- a 10% or more increase in total traffic flows; and
- an increase in HGV movements, with a criterion figure which is being agreed with Highways England and Cumbria County Council which will vary by location. A bespoke approach will be taken instead of applying the general 30% change in HGV movements (as stipulated by guidance for the Environmental Assessment of Road Traffic), which may not, for example, be appropriate in very lightly trafficked areas.

4.5.9 For rail, appropriate thresholds for change would be discussed with the relevant stakeholders. This will include reviewing outputs from Network Rail and DRS in relation to the use of the Cumbrian Coast Line railway for the Moorside Project. The Network Rail and DRS work will provide an understanding of the baseline position of the rail network against which threshold changes can be agreed.

4.5.10 For marine, a Navigational Risk Assessment will provide further information on the impact of the Moorside Project to enable appropriate thresholds for change to be identified and agreed with the relevant stakeholders. This would be assessed against the baseline understanding to quantify change against and will be included in the ES.

4.5.11 A Marine Off-loading Facility (MOLF) is proposed at the Moorside Site. This is as described in **Chapter 2** of this PEIR.

4.5.12 The Port of Workington is expected to be the main port used to serve the MOLF, supported by the Port of Liverpool. Up to 5 ships per day during peak construction are expected to use the MOLF. For operation the movements of large Abnormal Indivisible Loads (AIL) are not expected to be significant, totalling around one to two movements per year.

4.5.13 Given that the Port of Liverpool is an existing commercial port of considerable scale, the proportion of movements at the port likely to be associated with the Moorside Project will be negligible with no significant effect upon the Port of Liverpool's operations. This port has therefore not been subject to any further assessment.

Temporal Scope

4.5.14 The temporal scope of the assessment will be based around the AM and PM peak movements, with any use of inter-peak periods assessed against the thresholds noted above.

4.5.15 The existing weekday highway peak periods have been identified as:

- AM – 05:00 – 09:00.
- PM – 14:00 – 18:00.

4.5.16 A peak hour for each period will be established and is being sought to be agreed with stakeholders as part of the modelling scenario development, with road-based trips associated with worker movements to/from the Moorside Project, as well as the movement of materials being concentrated outside of the established baseline peak hour for both AM and PM, as much as is practicably possible.

4.5.17 Weekend traffic flows are not subjected to similar peaks, with weekend movements varying across the network, but typically concentrated between 10:00 and 17:00. The weekend peak flows are lower than the weekday peak periods, therefore assessment of weekday flows for possible mitigation will provide a realistic worst case analysis.

4.5.18 The seasonality of flows in the area will be assessed and taken into consideration in order to ensure that flows utilised for the baseline reflect peak demands on the network.

4.5.19 The assessment will cover both the construction and operational phases of the proposed development, with an assessment year to be established based on the intensity of the construction.

4.5.20 As noted in paragraph 4.2.2, potential effects associated with decommissioning are likely to be similar to or less than the effects arising from the construction phase, with the construction phase assessment therefore providing a reasonable worst case for considering decommissioning impacts.

Decommissioning is therefore not considered further in the assessment in this document.

Potentially significant effects

4.5.21 All of the Sensitive Receptors identified above within the 100 m buffer of the Transport Infrastructure, as well as Network User Receptors, are expected to experience some level of effect from increased flow rates along the primary highway corridors.

4.5.22 There are also likely to be impacts, adverse and beneficial, associated with intensified rail use, due to improved access to rail service provisions (such as Mirehouse public station) and additional patronage of services.

4.5.23 All of the effects on road, rail and marine transport receptors are being assessed and appropriate mitigation will be suggested to seek to reduce the magnitude of change and so the overall significance of the residual effects. This is discussed in detail in **Section 4.8** and consideration is also given to whether additional mitigation may be required in **Section 4.11**.

4.5.24 Environmental factors related to transportation, such as changes in noise and vibration and air quality will be considered within their respective chapters in the document (**Chapter 5, Noise and Vibration** and **Chapter 6, Air Quality**).

4.6 Environmental measures incorporated into the proposed development

4.6.1 **Table 4.2** provides a summary of the environmental measures which have been identified for addressing predicted changes and potential effects from the Moorside Project. At this time, these have been developed at a high level to address anticipated issues, with further work being undertaken to produce evidence of the effectiveness of these measures, as well as identifying further measures as appropriate.

Table 4.2 Rationale for incorporation of environmental measures

Potential receptor	Predicted changes and potential effects	Incorporated measure
Common to all of the Moorside Project		
Road (and some rail) receptors		
Sensitive receptors	Severance due to increased usage of highway by vehicles transporting construction materials or workers to, from and between the Moorside Project Sites.	Minimise the requirement for movements by road by: 1. Encouraging direct to site rail transport from point of origin for UK supply chain to reduce HGV movements on the network.

Potential receptor	Predicted changes and potential effects	Incorporated measure
	Congestion effects on the highway network. Fear and intimidation due to increased flows on the highway network. Safety concerns associated with increased traffic flows on the highway network.	2. Using sequencing and consolidation centres to reduce piecemeal loads. 3. Enforcing controls for construction workers by limiting private car access to all Moorside Project Sites to reduce vehicle demand. 4. Intercepting workers travelling to their accommodation at the Corkickle Site, Mirehouse Site and Egremont Site via shuttle coaches from the stations in Carlisle and Penrith or local train connections from Carlisle. 5. Seeking enhancements to key rail hubs between Barrow and Carlisle to encourage greater use of the scheduled service (workers to disembark at Sellafield station for coach shuttle transfer into the Moorside Site). 6. Providing direct bus services from non-rail linked locations where clusters of workers are anticipated e.g. Cockermouth. 7. Using coaches to transport workers from the Egremont Site, with connections by coach/bus from outlying settlements with no rail access. NuGen is developing a set of Transport Implementation Strategies which will seek to manage the timing of movements outside of the peaks when traffic flows are lower and there is more capacity on the network. Localised junction upgrades to provide additional capacity, provisions for pedestrians and improve safety.
Network user receptors	Journey delays and congestion effects due to an increase in traffic on the highway network. Safety concerns associated with increased traffic flows on the highway network. Congestion on side roads awaiting access onto the primary corridors.	Minimise the requirement for movements by road by: 1. Encouraging direct to site rail transport from point of origin for UK supply chain to reduce HGV movements on the network. 2. Using sequencing and consolidation centres to reduce piecemeal loads. 3. Enforcing controls for construction workers by limiting private car access to all the Moorside Project Sites to reduce vehicle demand.

Potential receptor	Predicted changes and potential effects	Incorporated measure
		4. Intercepting workers travelling to their accommodation at the Corkickle Site, Mirehouse Site and Egremont Site via shuttle coaches from the stations in Carlisle and Penrith, or local train connections from Carlisle 5. Seeking enhancements to key rail hubs between Barrow and Carlisle to encourage greater use of the scheduled service (workers to disembark at Sellafield station for coach shuttle transfer into the Moorside Site). 6. Providing direct bus services from non-rail linked locations where clusters of workers are anticipated e.g. Cockermouth. 7. Using coaches to transport workers from the Egremont site, with connections by coach/bus from outlying settlements with no rail access. NuGen is developing a set of Transport Implementation Strategies, which will seek to manage the timing of movements outside of the peaks when traffic flows are lower and there is more capacity on the network. Localised junction upgrades to provide additional capacity, improve accessibility to the primary corridors, provisions for pedestrians and improve safety.
Transport infrastructure	Accelerated deterioration in physical quality of highway network assets and infrastructure.	Minimise the requirement for movements by road by: 1. Encouraging direct to site rail transport from point of origin for UK supply chain to reduce HGV movements on the network. 2. Using sequencing and consolidation centres to reduce piecemeal loads. 3. Enforcing controls for construction workers by limiting private car assess to all Moorside Project Sites to reduce vehicle demand. 4. Intercepting workers travelling to their accommodation at the Corkickle Site, Mirehouse Site and Egremont Site e.g. from local train connections from Carlisle 5. Seeking enhancements to key rail hubs between Barrow and Carlisle to encourage

Potential receptor	Predicted changes and potential effects	Incorporated measure
		greater use of the scheduled service (workers to disembark at Sellafield station for coach shuttle transfer into the Moorside Site). 6. Providing direct bus services from non-rail linked locations where clusters of workers are anticipated e.g. Cockermouth 7. Using coaches to transport workers from the Egremont site, with connections by coach/bus from outlying settlements with no rail access. NuGen is developing a set of Transport Implementation Strategies, which will seek to manage the timing of movements outside of the peaks when traffic flows are lower and there is more capacity on the network.
Development at the Moorside Site only		
Rail Transport receptors		
Network user receptors	Journey delays due to an increased use of the rail network by freight and passengers.	The provision of dedicated charter trains for construction workers to avoid overcrowding on public services. Use of spare train paths for freight to ensure no existing uses are affected. New rail infrastructure (including rail loops) will minimise the effects on journey delay by providing passing points to reduce impacts upon scheduled services.
Marine Transport receptors		
Network user receptors	Disruption to shipping lanes due to marine traffic associated with the Moorside Site.	Shipping movements to be controlled by a Navigation Plan (which will form part of the NuGen Transport Strategy).
Development at the Corkickle Site and Mirehouse Site		
Rail receptors		
Network user receptors	Journey delays due to an increased use of the rail network by passengers utilising services from the Mirehouse Site and the Corkickle Site.	The provision of dedicated charter trains for construction workers to avoid overcrowding on public services. New rail infrastructure (including rail loops) will minimise the effects on journey delay by providing passing points to reduce impacts upon scheduled services.

Potential receptor	Predicted changes and potential effects	Incorporated measure
Corkickle to Mirehouse Railway and St. Bees Railway		
Network user receptors	Journey delays during construction	The construction period will not be protracted and will be concentrated where possible outside of peak times.
Highway Improvements		
Sensitive Users	Route obstruction or severance due to road closures or movement constraints.	Seek to ensure that access is maintained to residential properties where possible and that those affected are provided advanced warning and information on the impact.
Network user receptors	Severance and journey delays due to the construction of the highway improvement schemes and associated diversions or closures on the highway network during construction.	Where possible minimise disruption by maintaining one lane running and containing any road closures outside of the peak periods such as overnight. Seek to provide diversion routes for schemes which require road closures where possible or reduced running to ensure journey delay is minimised.

4.7 Assessment methodology

Methodology for prediction of effects

4.7.1 The level of the transport effects of the Moorside Project (and whether this is significant) is determined through consideration of the *'sensitivity'* of each identified receptor (or range of sensitivities for each receptor group) and the *'magnitude of change'* that would be brought about by the construction, and operation and decommissioning of the Moorside Project.

4.7.2 The methodology for the Transport Impact Assessment is based upon IEA guidelines for the environmental assessment of road traffic, as well as taking into account other relevant guidance such as the Design Manual for Roads and Bridges and DfT WebTAG guidance.

4.7.3 The prediction of effects for the highway network would be based upon a series of sensitivity tests applied within the traffic models (West Cumbria Traffic Model and the A595 micro-simulation model) to understand the change from baseline.

4.7.4 The overarching assessment methodology is developed around a series of sensitivity tests which are being confirmed through stakeholder discussions and shaped by the emerging strategies, which cover key elements such as the locations of the Accommodation Sites. The sensitivity tests identify modal capacity against which an assessment of additional impacts against the agreed

thresholds. This includes road, rail and public transport. Whilst a standard matrix (table) approach is advocated, (following best practice from a range of sources such as DMRB), for each element the significance of the impacts is being reviewed, applying a degree of professional judgement in the interpretation of the magnitude of the change in effects in relation to the sensitivity of the receptors.

4.7.5 The use of rail will be important for removing trips from the highway network, with the impacts upon the rail network assessed accordingly, including changes to passenger services and the provision of additional freight services. Key areas which are being included in the rail assessment are:

- identifying the available capacity of the rail network, for the movement of both passengers and freight, to identify measures to maximise the potential of the rail mode;
- the movement of people between relevant railway stations and the Moorside Site;
- the opportunity to achieve direct rail access to the Moorside Site;
- disruptions to rail services from overnight short closures to accommodate track crossings at a level crossing point to access the proposed MOLF. Currently the railway is closed overnight, meaning that disruption would be minimal if this operating pattern is maintained, with vehicles able to cross the railway whilst it is closed; and
- the possibility of using rail to provide a multi-modal connection with other modes, such as deliveries from ports.

4.7.6 The varying uses of port and MOLF options may require different modes (e.g. construction bulk materials, modular components and AILs would not necessarily utilise the same access mode). Based on this, the assessment of the impacts from the preferred options will be based upon the following:

- identifying the available capacity of the preferred marine access options by load type; and
- the ability for supporting multi-modal connections, such as with rail.

4.7.7 This is being supported through the Navigational Risk Assessment to identify impacts upon shipping lanes and operations to include non-recreational marine users.

Significance evaluation methodology

4.7.8 Overarching guidance for determining the significance of effects is set out in **Chapter 3** of this PEIR document.

4.7.9 For road transportation, the methodology for determining magnitude of change to the baseline and the sensitivity of receptors follows guidance set out by the DMRB (Volume 11 Section 2 Part 5 (HA 205/08 Assessment and Management of Environmental Effects) as well as Guidelines on the Environmental Assessment of Road Traffic, which both provide advice on

determining the magnitude of change against each environmental criteria through the identification of potential thresholds. The assignment of thresholds will be undertaken once further information is available to fully understand the baseline.

4.7.10 For rail and marine, appropriate thresholds will be considered in the context of significance criteria, which are to be determined and agreed with key stakeholders and will be incorporated into the full assessment to be contained in the ES.

4.7.11 For this preliminary assessment, the following matrix (**Table 4.3**) has been applied:

Table 4.3 Significance evaluation matrix

		Magnitude of change				
		Very high	**High**	**Medium**	**Low**	**Very low**
Sensitivity	**Very high**	**Major** (Significant)	**Major** (Significant)	**Major** (Significant)	**Major** (Significant)	**Moderate** (Potentially Significant)
	High	**Major** (Significant)	**Major** (Significant)	**Major** (Significant)	**Moderate** (Potentially Significant)	**Minor** (Not Significant)
	Medium	**Major** (Significant)	**Major** (Significant)	**Moderate** (Potentially Significant)	**Minor** (Not Significant)	**Negligible** (Not Significant)
	Low	**Major** (Significant)	**Moderate** (Potentially Significant)	**Minor** (Not Significant)	**Negligible** (Not Significant)	**Negligible** (Not Significant)
	Very low	**Moderate** (Potentially Significant)	**Minor** (Not Significant)	**Negligible** (Not Significant)	**Negligible** (Not Significant)	**Negligible** (Not Significant)

Note: Significant effects are those identified as 'Major'. 'Moderate' effects have the potential to be significant, but this depends on the environmental topic and the use of professional judgment.

4.8 Preliminary assessment of residual effects

Baseline conditions

Highways

4.8.1 As previously noted, the main highway routes in the study area have been identified as primary routes, with supporting secondary routes from these also identified.

4.8.2 Baseline traffic flows on the highway network will be assessed through a modelling exercise. As previously explained, two models will be used to understand the existing movements on the highway network and to understand how much spare capacity remains to accommodate further traffic associated with the proposed development.

4.8.3 Both models make use of the traffic survey data which has been collected to develop a baseline scenario with regards to capacity on the highway network and volumes of traffic flows.

4.8.4 The West Cumbria Transport Model, owned and operated by Cumbria County Council, provides a high level overview of most routes in West Cumbria as far east as the M6.

4.8.5 The A595 micro-simulation model focusses on the A595 from Gosforth in the south to the junction with Inkerman Terrace (A5094) in the north at Whitehaven and is reviewing impacts occurring along this stretch. Any junctions further afield which are likely to be affected (for example adjacent to other Moorside Project Sites) are being assessed through localised modelling techniques using software to look at junctions individually. The extent of the micro-simulation model is shown in **Figure 4.13**.

4.8.6 The development of the highway baseline is still in progress with further detail expected to come forward during the remainder of 2016 and will include the following:

- the existing conditions of the highway network (pavement/carriageway condition) and structures (network assets, such as bridges and culverts) located along it are being assessed in conjunction with Cumbria County Council and Highways England to agree a baseline condition for these;
- accident data for the primary routes (in the first instance), which is being reviewed to understand the existing prevalence of these on the network, and highlight locations where mitigation measures may be required to address safety concerns. This information will have an impact upon road users; vehicle users, pedestrians and cyclists; and
- existing journey time delay is being assessed at existing junctions to understand current journey times to compare against future journey times being predicted by the models.

Walking and Cycling

4.8.7 Existing public rights of way and cycle routes, which are in close proximity to the Moorside Project Sites are being captured through a desktop exercise. For the primary routes, pedestrian crossings and existing footways and cycle routes adjacent to the highway are being captured.

4.8.8 These routes are being mapped and the impact upon them is being assessed in line with any increase in flows on the adjacent highways. This includes understanding the ability to cross roads and any pedestrian severance or fear and intimidation issues that the increased flows, due to the development proposals, may cause for pedestrians and cyclists on the network.

4.8.9 The recreational effects in respect of other footpaths or cycle routes, which are not located adjacent to a highway, are being assessed in **Chapter 9, Countryside Access and Recreation**.

Rail

4.8.10 A rail baseline has been determined by Network Rail and DRS, providing clarification on the current status of the Cumbria Coast Line railway in terms of its capacity, condition and future potential for use for the Moorside Project. This information will be used to inform the ES that will be submitted with the DCO application in 2017.

4.8.11 A summary of the headlines from the baseline information gathered with regards to the Cumbrian Coast Line railway is provided below.

4.8.12 The Cumbrian Coastline Line railway runs from Carlisle in the north (where there is a connection with the West Coast Mainline (WCML) as well as other lines which serve the North East of England and Scotland). It generally follows the coastline round to Barrow-in-Furness in the south. From here the Furness Railway provides a connection on to Carnforth (where southbound connections on the WCML are possible).

4.8.13 The route is mainly rural in character, but is punctuated by several significant towns (Carnforth, Grange-over-Sands, Ulverston, Barrow, Whitehaven, Workington, Maryport and Carlisle), along its 110 mile (177 km) length.

4.8.14 It is expected that the majority of the impact upon the Cumbrian Coast Line railway will be focussed between Carlisle and Sellafield, with the sites for the Moorside Project Railway being located north of the Sellafield Site. Workers may also choose to use the scheduled services from the south to reach the Moorside Site (via Sellafield Station). It is also possible that some rail freight may come from the south, although the volumes of rail traffic from the south are expected to be very low, with the vast majority of rail freight coming from a northerly direction of the Moorside Site.

4.8.15 There are 24 stations between Carlisle and Barrow-in-Furness. These are mostly unmanned stations, although Whitehaven and Workington Stations are described as ‘small staffed’. Millom has a ‘discovery centre’ museum which also acts as a ticket and information office. The majority of movements are expected on the northern part of the network, particularly between the Accommodation Sites and the Moorside Site and Sellafield Station. The location of the stations between Carlisle and Sellafield are shown in **Figure 4.14**.

4.8.16 The northern section of the route between Whitehaven and Carlisle currently has an hourly local passenger service between 06:00 and 22:00 (but with a few gaps in places), with most of these extended south to Sellafield, Millom and Barrow. The southern section of route between Barrow-in-Furness and Lancaster has approximately one ‘semi-fast’ service every two hours (most going forward to Manchester Airport) and a local passenger service every two hours, thus providing an approximately hourly combined service (with intervals further reduced in the peak to/from the south). The services are scheduled to

change, at latest, from December 2017 under the specification for the renewed franchise.

4.8.17 Passenger demand on the route is concentrated on the section between Whitehaven and Carlisle, and the southern section of the route between Barrow and Carnforth. In addition there are significant commuter flows at certain times of day between Barrow and Sellafield. However, the essentially rural nature of the route between Barrow and Whitehaven (excluding Sellafield) and the limited number of services, result in low levels of passenger demand.

4.8.18 In terms of freight usage, analysis of historical and current rail freight traffic flows on the Cumbrian Coast Line shows it to be currently working to a fraction of its potential. At its peak in 1989, 50,000 tonnes of freight per week travelled on the line compared to just 5,000 tonnes/week now.

4.8.19 The route between Carlisle and Carnforth is mainly a double track railway, with a single line section between Sellafield and Whitehaven, although (there is an existing passing loop at St. Bees, which offers the ability for trains of up to 218 m in length to pass.

4.8.20 At Parton, coastal erosion and landslips have led to the railway being reduced to a single line, whilst passenger operations at Maryport have been focused on a single platform.

4.8.21 The majority of the line works on an Absolute Block signalling system. This is the simplest and most outdated of signalling systems, where only a single train may be permitted in each track section, because it is operated by outdated mechanical signalling that communicates between adjacent sections using bell codes. As such, line capacity is constrained to the length of time to traverse the section between signal boxes, which if of appreciable distance acts as a major limitation to increasing train frequencies. This signalling also affects the route opening times, with at present no Sunday services in operation.

4.8.22 Two new rail loops are therefore proposed to support the Moorside Project – the Corkickle to Mirehouse Railway and the St. Bees Railway. These two loops will allow trains to pass one another, thereby increasing the capacity of the line. The Corkickle to Mirehouse Railway will enable the proposed charter trains to be loaded and unloaded with workers at the stations located at the Corkickle and Mirehouse Sites without disrupting other services on the line. The St. Bees Railway will provide a longer passing loop facility for trains to pass on the line to permit two way movements on the single track line.

4.8.23 The route also has over thirty level crossings, nineteen of which are operated by Network Rail with the remainder being user-operated level crossings. These level crossings will be impacted upon by increased use of the line.

4.8.24 Line speeds on the route are generally between 30 mph and 60 mph on plain line sections away from stations, with lower speeds (as low as 10 mph) where track curvature is severe (for instance on the approaches to Carlisle Station).

4.8.25 The line is known to be susceptible to disruption due to weather events, notably as the result of coastal flooding and the impact of the flooding on sea

wall defences, ground stability and the transfer of beach material onto the railway formation. This has led to the 'singling' of the track around Parton with an associated 15 mph speed restriction.

4.8.26 Loading gauge restrictions exist on this line as they do on the entire UK rail network. The Cumbrian Coast Line loading gauge is W6A on the majority of the route, meaning standard UK wagons can travel on the line without issue. The maximum length of trains permitted over the route is 403 m.

4.8.27 Capacity on the rail line is determined by '*paths*', which define the maximum number of trains that each section of track can accommodate within a given period of time. Spare paths exist on the line with sufficient availability to accommodate the Moorside Project requirements. This is being actively discussed with Network Rail alongside the requirements of the Moorside Site Railway, the Corkickle to Mirehouse Railway and the St. Bees Railway, which will provide improved opportunity for further spare capacity on the line.

Marine

4.8.28 **Chapters 15** to**17** of this PEIR deal with the environmental baseline from a marine environment perspective. This chapter is concerned with existing transportation services which occur from the Port of Workington, as well as existing sea freight and passenger services that operate in close proximity to the Moorside Site and which may be affected by its development due to the potential disruption of shipping lanes.

4.8.29 Baseline information is still being collated with regards to shipping movements in the vicinity of the Moorside Site (which may be impacted upon by movements associated with the construction phase) and to/from the Port of Workington. This information will be used in the assessment of the significance of the effects on marine transportation receptors from the Moorside Project, notably in terms of the intensified use of shipping lanes and the implications for other users.

4.8.30 Information has been collated with regards to the baseline operation at the Port of Workington in relation to the existing freight handling capacities and facilities. A summary of this is provided below:

- Vessels up to 137.2 metres LOA (length overall) and 20.4 metres beam can be accommodated at the Port.
- The 2016 tidal range varies from 7.3 metres (high neap tide) to 10.4 metres (high spring tide). Based on a tide of 7.3 metres, the maximum vessel draft would be 6.1 metres and on a tide of 10.4 metres, the maximum vessel draft would be 9.2 metres.
- The Port operates an enclosed dock with a single set of dock gates to keep berthed vessels afloat during the low water period. The dock gate entrance can accommodate a maximum vessel beam of 20.04 m.
- The dock gates are opened up to 2.5 hours prior to high water and close up to 2 hours after, dependent on the draft of vessels at berth in the dock.

- The quay frontage is 772.8 m, with a 2.6 ha total area.
- There are 7 berths at the port as well as a roll on/roll off (ro-ro) berth, all of which are rail connected.
- There are seven warehouses at the Port, which vary in size from 647 m^3 to 1,696 m^3, with a collective area of 6,763 m^3.
- In 2014/15, the port handled a total (in and out) of 265,311 tonnes of materials, with just over 90% of those movements being inward. The main inward tonnages were for timber, wood pulp, cement and gypsum. The main outward tonnages were for recycled materials and bulk liquids.
- There are 7 berths at the port as well as a roll on/roll off (ro-ro) berth, all of which are rail connected:
- AILs are able to be handled by the Port using specific high capacity equipment or with suitable third-party plant equipment.

4.8.31 This information, together with further discussions with the Port of Workington is being used to finalise the baseline for marine activities and operations at the port, against which change can be assessed.

4.8.32 The impact upon recreational marine users is covered in **Chapter 9, Countryside Access and Recreation**.

Predicted residual effects and their significance

4.8.33 The evaluation tables present a preliminary assessment of the potential likely significant adverse effects arising from the Moorside Project (unless explicitly stated to be neutral or beneficial in the rationale).

4.8.34 Each individual site has been assessed in relation to its own construction and operation phase, rather than on the basis of any project wide phasing.

4.8.35 **Tables 4.4 - 4.7** are based on a preliminary assessment of the predicted residual effects using information available to date and are subject to change in the final ES.

Table 4.4 Development at the Moorside Site: Summary of predicted residual effects

Receptor and summary of predicted effects	Probability	Sensitivity/ value of receptor	Magnitude of change	Significance of effect	Rationale
Construction					
Receptor 1 (Sensitive receptors)					
Severance due to increased usage of highway routes by vehicles transporting construction materials or workers to, from and between the Moorside Project sites.	Likely	Medium	Medium	Moderate (Potentially Significant)	Routing of vehicles, operational times and consolidation will seek to minimise vehicle numbers and avoid where possible established communities and on this basis a medium magnitude of change has been predicted at this stage. However, the final outcome is subject to the confirmation of the road traffic demand during each phase and the effectiveness of the incorporated mitigation derived from the modelling, together with the timing of its implementation.
Congestion effects on the highway network.	Likely	Medium	Medium	Moderate (Potentially Significant)	The use of the highway network will be minimised as a result of the Transport Strategy, and this, combined with the proposals to undertake the Highway Improvements at key locations along the route, has resulted in predicted medium magnitude of change.
Fear and intimidation due to increased flows on the highway network.	Likely	Medium	Medium	Moderate (Potentially Significant)	Routing of vehicles, operational times and consolidation will seek to minimise vehicle numbers and avoid where possible established communities and on this basis a medium magnitude of change has been predicted at this stage. However, the final outcome is subject to the confirmation of the road traffic demand during each phase and the effectiveness of the incorporated mitigation derived from the modelling, together with the timing of its implementation.

Receptor and summary of predicted effects	Probability	Sensitivity/ value of receptor	Magnitude of change	Significance of effect	Rationale
Safety concerns associated with increased traffic flows on the highway network.	Likely	Medium	Low	Minor (Not significant	The use of the highway network will be minimised as a result of the Transport Strategy, and this, combined with the proposals to undertake the Highway Improvements at key locations along the route, means that impacts will be mitigated where practical. This will ensure the magnitude of change is managed and kept as low as possible. This has resulted in a predicted low magnitude of change.
Receptor 2 (Network Users)					
Journey delays due to an increase in traffic on the highway network.	Likely	Medium	Medium	Moderate (Potentially Significant)	The use of the highway network will be minimised as a result of the Transport Strategy, and this, combined with the proposals to undertake the Highway Improvements at key locations along the route, means that impacts will be mitigated where practical. This will ensure the magnitude of change is managed and kept as low as possible. This has resulted in a predicted medium magnitude of change.
Journey delays due to an increased use of the rail network by freight and passengers.	Likely	Low	Low	Negligible (Not Significant)	It is understood that there will be sufficient pathways and capacity on the rail network to accommodate the additional movements required and therefore the magnitude of change is predicted to be low.
Safety concerns associated with increased traffic flows on the highway network.	Likely	Medium	Low	Minor (Not Significant)	The use of the highway network will be minimised as a result of the Transport Strategy, and this, combined with the proposals to undertake the Highway Improvements at key locations along the route, means that impacts will be mitigated where practical. This will ensure the magnitude of change is managed and kept as low as

Receptor and summary of predicted effects	Probability	Sensitivity/ value of receptor	Magnitude of change	Significance of effect	Rationale
					possible. This has resulted in a predicted low magnitude of change.
Congestion effects on the highway network.	Likely	Medium	Medium	Moderate (Potentially Significant)	The use of the highway network will be minimised as a result of the Transport Strategy, and this, combined with the proposals to undertake the Highway Improvements at key locations along the route, means that impacts will be mitigated where practical. This will ensure the magnitude of change is managed and kept as low as possible. This has resulted in a predicted medium magnitude of change.
Disruption to shipping lanes and commercial fishing vessels due to marine traffic associated with the Moorside Site.	Unlikely	Low	Low	Negligible (Not Significant)	It is expected that the required shipping movements will operate with minimum disruption to existing marine activities. Shipping movements are expected to be no higher than up to 5 daily movements in the peak of construction, and hence the magnitude of change is predicted to be low.
Disruption to operations at the Port of Workington due to movements associated with the development of the Moorside Site.	Likely	Medium	Medium	Moderate (Potentially Significant)	Movements through the Port of Workington would be planned around existing operations. Shipping movements are expected to be no higher than up to 5 daily movements in the peak of construction.
Receptor 3 (Transport Infrastructure)					
Accelerated deterioration in physical quality of highway network assets and infrastructure.	Likely	Very low	Low	Negligible (Not Significant)	The use of the highway network will be minimised. The highway assets are expected to be in a condition such that no major interventions will be required during construction activity. This should ensure the magnitude of change is managed and kept low.

Receptor and summary of predicted effects	Probability	Sensitivity/ value of receptor	Magnitude of change	Significance of effect	Rationale
Accelerated deterioration in physical quality of rail network assets and infrastructure.	Likely	Very low	Low	Negligible (Not Significant)	The rail assets are expected to be in a condition such that no major interventions will be required during construction activity. This should ensure the magnitude of change is managed and kept low.
Operation					
Receptor 1 (Sensitive receptors)					
Severance due to increased usage of highway routes by vehicle movements to and from the Moorside site.	Likely	Medium	Medium	Moderate (Potentially Significant)	Operational shift times and management of outages will seek to minimise vehicle numbers, and hence a medium magnitude is predicted. However, this will be re-assessed in the ES once further data has been acquired, including with respect to the traffic demand, and the modelling updated.
Congestion effects on the highway network.	Likely	Medium	Medium	Moderate (Potentially Significant)	Operational shift times and management of outages will seek to minimise vehicle numbers, together with highway mitigation schemes where practical and hence a medium magnitude is predicted. However, this will be re-assessed in the ES once further data has been acquired, including with respect to the traffic demand, and the modelling updated.
Fear and intimidation due to increased flows on the highway network.	Likely	Medium	Medium	Moderate (Potentially Significant)	Operational shift times and management of outages will seek to minimise vehicle numbers and hence a medium magnitude is predicted. However, this will be re-assessed in the ES once further data has been acquired, including with respect to the traffic demand, and the modelling updated.

Receptor and summary of predicted effects	Probability	Sensitivity/ value of receptor	Magnitude of change	Significance of effect	Rationale
Safety concerns associated with increased traffic flows on the highway network.	Likely	Medium	Medium	Moderate (Potentially Significant)	Operational shift times and management of outages will seek to minimise vehicle numbers and hence a medium magnitude is predicted. However, this will be re-assessed in the ES once further data has been acquired, including with respect to the traffic demand, and the modelling updated.
Receptor 2 (Network Users)					
Journey delays due to an increase in traffic on the highway network.	Likely	Medium	Medium	Moderate (Potentially Significant)	Operational shift times and management of outages will seek to minimise vehicle numbers, together with highway mitigation schemes where practical. This should ensure the magnitude of change is managed and minimised.
Journey delays due to an increased use of the rail network by freight and passengers.	Likely	Medium	Medium	Moderate (Potentially Significant)	It is expected that there will be sufficient pathways and capacity on the rail network to accommodate the additional movements required. This should ensure the magnitude of change is managed and minimised.
Safety concerns associated with increased traffic flows on the highway network.	Likely	Medium	Medium	Moderate (Potentially Significant)	Operational shift times and management of outages will seek to minimise vehicle numbers. This should ensure the magnitude of change is managed and minimised.
Congestion effects on the highway network.	Likely	Medium	Low	Minor (Not Significant)	Operational shift times and management of outages will seek to minimise vehicle numbers. Mitigation and legacy improvements which are destined for the construction period will provide betterment to users. This will ensure the magnitude of change is managed and kept low.

Receptor and summary of predicted effects	Probability	Sensitivity/ value of receptor	Magnitude of change	Significance of effect	Rationale
Disruption to shipping lanes and commercial fishing vessels due to marine traffic associated with the Moorside Site.	Unlikely	Low	Low	Negligible (Not Significant)	Use of shipping during Moorside operation will be negligible, and hence and has resulted in predicted low magnitude of change.
Disruption to operations at the Port of Workington due the movements associated with on-going servicing of the Moorside Site.	Likely	Low	Low	Minor (Not Significant)	Use of shipping during Moorside operation will be negligible and hence and has resulted in predicted low magnitude of change.
Receptor 3 (Transport Infrastructure)					
Accelerated deterioration in physical quality of highway network assets and infrastructure due to on-going use for servicing Moorside.	Likely	Low	Low	Negligible (Not Significant)	Increase in traffic movements will be low, and confined largely to private cars. The use of the highway network will be minimised. This should ensure the magnitude of change is managed and kept low.
Accelerated deterioration in physical quality of rail network assets and infrastructure due to on-going use for servicing Moorside.	Likely	Low	Low	Negligible (Not Significant)	Freight and passenger movements will be low. This should ensure the magnitude of change is managed and kept low.

Table 4.5 Development at the Accommodation Sites: Summary of predicted residual effects

Receptor and summary of predicted effects	Probability	Sensitivity/value of receptor	Magnitude of change	Significance of effect	Rationale
Construction					
Receptor 1 (Sensitive receptors)					
Severance due to increased usage of highway routes by vehicle movements to and from the sites for construction.	Likely	Medium	Medium	Moderate (Potentially Significant)	All three Accommodation Sites will be reliant on highway access during their construction. The use of the highway network will be minimised. The highway improvements will provide an improved network to address concerns with regards to severance. Whilst the scale of development differs at each Accommodation Site, the magnitude of change is predicted to be the same at this stage.
Congestion effects on the highway network.	Likely	Medium	Medium	Moderate (Potentially Significant)	All three Accommodation Sites will be reliant on highway access during their construction. The use of the highway network will be minimised by consolidating movements where practical. The highway improvements will provide an improved network with additional capacity to directly address congestion or delay. Whilst the scale of development differs at each Site, the magnitude of change is predicted to be the same at this stage.
Fear and intimidation due to increased flows on the highway network.	Likely	Medium	Medium	Moderate (Potentially Significant)	All three Accommodation Sites will be reliant on highway access during their construction. The use of the highway network will be minimised by consolidating movements where practical. The highway improvements will seek to facilitate pedestrian and cyclist movements to reduce severance and associated fear and intimidation. Whilst the scale of development differs at each Site, the magnitude of change is predicted to be the same at this stage.

Receptor and summary of predicted effects	Probability	Sensitivity/value of receptor	Magnitude of change	Significance of effect	Rationale
Safety concerns associated with increased traffic flows on the highway network.	Likely	Medium	Medium	Moderate (Potentially Significant)	All three Accommodation Sites will be reliant on highway access during their construction. The use of the highway network will be minimised by the proposals to undertake the Highway Improvements at key locations which will include addressing existing safety concerns. Whilst the scale of development differs at each Site, the magnitude of change is predicted to be the same at this stage.
Receptor 2 (Network Users)					
Journey delays due to an increase in traffic on the highway network.	Likely	Low	Low	Negligible (not significant)	Times of access to the highway network will be controlled and managed. All three Accommodation Sites will be reliant on highway access during their construction. The use of the highway network will be minimised and the proposals to undertake the Highway Improvements at key locations will provide additional capacity to reduce journey delay and congestion. Whilst the scale of development differs at each Site, the magnitude of change is predicted to be the same at this stage.
Safety concerns associated with increased traffic flows on the highway network.	Likely	Medium	Medium	Moderate (Potentially Significant)	All three Accommodation Sites will be reliant on highway access during their construction. The use of the highway network will be minimised by the proposals to undertake the Highway Improvements at key locations which will include addressing existing safety concerns. Whilst the scale of development differs at each Site, the magnitude of change is predicted to be the same at this stage.
Congestion effects on the highway network.	Likely	Medium	Medium	Moderate (Potentially Significant)	All three Accommodation Sites will be reliant on highway access during their construction. The use of the highway network will be minimised by consolidating movements where practical. The highway improvements will provide an improved

Receptor and summary of predicted effects	Probability	Sensitivity/value of receptor	Magnitude of change	Significance of effect	Rationale
					network with additional capacity to directly address congestion or delay. Whilst the scale of development differs at each Site, the magnitude of change is predicted to be the same at this stage.
Journey delays due to an increase in traffic on the highway network.	Likely	Medium	Medium	Moderate (Potentially Significant)	Times of access to the highway network will be controlled and managed. All three Accommodation Sites will be reliant on highway access during their construction. The use of the highway network will be minimised and the proposals to undertake the Highway Improvements at key locations will provide additional capacity to reduce journey delay and congestion. Whilst the scale of development differs at each Site, the magnitude of change is predicted to be the same at this stage.
Journey delays due to an increased use of the rail network by freight and passengers. **(Mirehouse and Corkickle Sites only)**	Likely	Medium	Low	Minor (Not Significant)	During the construction of the Mirehouse Site and the Corkickle Site, rail is unlikely to be available from the beginning meaning there will be a lower magnitude of change associated with the rail network.
Receptor 3 (Transport Infrastructure)					
Accelerated deterioration in physical quality of highway network assets and infrastructure.	Unlikely	Low	Low	Moderate (Potentially Significant)	The use of the highway network will be minimised. The highway assets are expected to be in a condition such that no major interventions will be required during construction activity. This should ensure the magnitude of change is managed and kept low and has resulted in predicted low magnitude of change.
Accelerated deterioration in physical quality of rail	Unlikely	Low	Low	Negligible (Not Significant)	Freight and passenger movements will be negligible due it the reliance on highway access during construction. This should

Receptor and summary of predicted effects	Probability	Sensitivity/value of receptor	Magnitude of change	Significance of effect	Rationale
network assets and infrastructure. **(Mirehouse and Corkickle Sites only)**					ensure the magnitude of change is managed and kept low and has resulted in predicted low magnitude of change.
Operation					
Receptor 1 (Sensitive receptors)					
Severance due to increased usage of highway routes by vehicle movements to and from the sites by construction workers.	Likely	Medium	Low	Minor (Not Significant)	Construction workers will be transported to the Moorside Site by private coach or rail. Non-work car trips will be controlled to off-peak periods. This should ensure the magnitude of change is managed and kept low.
Congestion effects on the highway network.	Likely	Medium	Low	Minor (Not Significant)	Construction workers will be transported to the Moorside Site by private coach or rail. Non-work car trips will be controlled to off-peak periods. This should ensure the magnitude of change is managed and kept low and has resulted in predicted low magnitude of change.
Fear and intimidation due to increased flows on the highway network.	Likely	Medium	Low	Minor (Not Significant)	Construction workers will be transported to the Moorside Site by private coach or rail. Non-work car trips will be controlled to off-peak periods. This should ensure the magnitude of change is managed and kept low and has resulted in predicted low magnitude of change.
Safety concerns associated with increased traffic flows on the highway network.	Likely	Medium	Low	Minor (Not Significant)	Construction workers will be transported to the Moorside Site by private coach or rail. Non-work car trips will be controlled to off-peak periods. This should ensure the magnitude of change is managed and kept low and has resulted in predicted low magnitude of change.

Receptor and summary of predicted effects	Probability	Sensitivity/value of receptor	Magnitude of change	Significance of effect	Rationale
Receptor 2 (Network Users)					
Journey delays due to an increase in traffic on the highway network.	Likely	Medium	Very Low	Minor (Not Significant)	Construction workers will be transported to the Moorside Site by private coach or rail. Non-work car trips will be controlled to off-peak periods. This should ensure the magnitude of change is managed and kept low and has resulted in predicted low magnitude of change.
Safety concerns associated with increased traffic flows on the highway network.	Likely	Medium	Very Low	Minor (Not Significant)	Construction workers will be transported to the Moorside Site by private coach or rail. Non-work car trips will be controlled to off-peak periods. This should ensure the magnitude of change is managed and kept low and has resulted in predicted low magnitude of change.
Congestion effects on the highway network.	Likely	Medium	Very Low	Minor (Not Significant)	Construction workers will be transported to the Moorside Site by private coach or rail. Non-work car trips will be controlled to off-peak periods. This should ensure the magnitude of change is managed and kept low and has resulted in predicted low magnitude of change.
Journey delays due to an increase in traffic on the highway network.	Likely	Medium	Very Low	Minor (Not Significant)	Construction workers will be transported to the Moorside Site by private coach or rail. Non-work car trips will be controlled to off-peak periods. This should ensure the magnitude of change is managed and kept low and has resulted in predicted low magnitude of change.
Journey delays due to an increased use of the rail network by freight and passengers.	Likely	Low	Low	Negligible (Not significant)	It is expected that there will be sufficient pathways and capacity on the rail network to accommodate the additional movements required. This should ensure the magnitude of change is managed and kept low and has resulted in predicted low magnitude of change.

Receptor and summary of predicted effects	Probability	Sensitivity/value of receptor	Magnitude of change	Significance of effect	Rationale
Receptor 3 (Transport Infrastructure)					
Accelerated deterioration in physical quality of highway network assets and infrastructure.	Likely	Medium	Low	Moderate (Potentially Significant)	The highway assets are expected to be in a condition such that no major interventions will be required during operation activity. The use of the highway network will be minimised. This should ensure the magnitude of change is managed and kept low and has resulted in predicted low magnitude of change.
Accelerated deterioration in physical quality of rail network assets and infrastructure.	Unlikely	Low	Low	Negligible (Not significant)	It is expected that there will be sufficient pathways and capacity on the rail network to accommodate the additional movements required. This should ensure the magnitude of change is managed and kept low and has resulted in predicted low magnitude of change.

Table 4.6 Development at the Corkickle to Mirehouse Railway and St. Bees Railway Sites: Summary of predicted residual effects

Receptor and summary of predicted effects	Probability	Sensitivity/ value of receptor	Magnitude of change	Significance of effect	Rationale
Construction					
Receptor 1 (Sensitive receptors)					
Construction traffic on the highway network in the vicinity of and routes to/from the two sites.	Low	Low	Very Low	Negligible (Not significant)	Rail works will largely be accessed from the rail network with minimal road based support (likely to be one or two vehicles).
Receptor 2 (Network Users)					
Journey delay for rail services due to construction of rail loops.	Likely	Medium	Medium	Moderate (Potentially Significant)	Possible service disruption to accommodate safe working.
Receptor 3 (Transport Infrastructure)					
Accelerated deterioration in physical quality of rail network assets and infrastructure due to more intensive use during construction.	Likely	Low	Low	Negligible (Not significant)	The construction period for the Corkickle to Mirehouse Railway and St. Bees Railway will not be protracted and therefore an accelerated deterioration of the network assets is predicted to be of low magnitude.
Operation					
Receptor 1 (Sensitive receptors)					
No transport specific impacts are anticipated for Sensitive Receptors.					

Receptor and summary of predicted effects	Probability	Sensitivity/ value of receptor	Magnitude of change	Significance of effect	Rationale
Receptor 2 (Network Users)					
Enhanced service frequencies or durations due to passing loops.	Likely	Low	Very Low	Negligible (Not significant)	Passing loops will provide additional network resilience during operation and therefore the magnitude of change would be very low, with resultant negligible effects.
Receptor 3 (Transport Infrastructure)					
Accelerated deterioration in physical quality of rail network assets and infrastructure due to more intensive use during operation.	Likely	Low	Low	Negligible (Not significant)	Passing loops will provide additional network resilience during operation and therefore the magnitude of change would be low, with resultant negligible effects.

Table 4.7 The 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
Construction					
Receptor 1 (Sensitive receptors)					
Construction traffic on the highway network at and in the vicinity of the sites for the Highway Improvements.	Likely	Medium	Medium	Moderate (Potentially Significant)	The number of construction vehicles and deliveries associated with the sites for the Highway Improvements will generally be limited due to the nature of the works proposed and will be concentrated into concise construction periods, which will be assessed and reported on in the ES.
Receptor 2 (Network Users)					
Journey delay for highway users due to construction at the sites for the Highway Improvements.	Likely	Medium	Medium	Moderate (Potentially Significant)	Possible congestion and disruption to accommodate safe working can be expected during peak times, although good site management will be implemented to minimise any unnecessary delays which will be assessed and reported on in the ES.
Receptor 3 (Transport Infrastructure)					
Accelerated deterioration in physical quality of highway network and infrastructure due to more intensive use during construction.	Likely	Low	Very Low	Negligible (Not significant)	The construction period for each Highway Improvement development is not expected to be protracted and will have a very low magnitude of change on the wider network infrastructures as a result of the works.

Receptor and summary of predicted effects	Probability	Sensitivity/ value of receptor	Magnitude of change	Significance of effect	Rationale
Operation					
Receptor 1 (Sensitive receptors)					
Increased flows through the Highway Improvement Sites	Likely	Medium	Low	Minor (Not Significant)	The Highway Improvements are intended to improve traffic flow and capacity at the sites for the Highway Improvements during operation, and is expected to have a low magnitude of change on the wider network infrastructures as a result of the works.

4.8.36 In addition to the consideration of adverse effects, it is anticipated that the proposals for rail infrastructure improvement works at the Corkickle to Mirehouse and St. Bees Railways Sites will result in beneficial effects during the operation period.

4.8.37 The objective of the proposed highway improvement works is to, once completed, provide beneficial effects during the construction periods of the various Moorside Sites, together with a legacy benefit post-construction.

4.9 Whole Moorside Project Assessment

4.9.1 An assessment of the Moorside Project as a whole will be included in the ES. For the purposes of this PEIR, due to the limitations set out above, the PEIR has looked at the development at the Moorside Site, the Accommodation Sites, the Corkickle to Mirehouse Railway and St. Bees Rail Sites, and the sites for the Highways Improvements together and considered whether there would be any additional, '*accumulated effects*' on specific environmental receptors..

4.9.2 With respect to transport, the maximum Zone of Influence (ZoI) is considered to be 100 m from the Transport Infrastructure. **Figures 4.6 to 4.12** show the location of the key transport receptors relative to the Moorside Project. Since some of these receptors will be affected by the development of all of the Moorside Project Sites, whilst other receptors will be affected by one of more of the developments, depending on where they are located, or which sections of road they use, a preliminary high level of the effects of the Moorside Project as a whole has been carried out.

4.9.3 Impacts on the highway network will be associated with both the construction and operational phases and be linked to the movement of workers and freight by road. As part of the overall incorporated mitigation proposals, peak movements on the road network will be avoided as much as is practically possible through the determining of shift patterns.

4.9.4 Worker movements by road will also be minimised, with the Mirehouse Site and the Corkickle Site being rail connected to allow workers to travel to the Moorside Site by rail, instead of by road. Workers from the Egremont Site will travel to the Moorside Site by coach, so consolidating the number of movements. Workers who do not reside at the Accommodation Sites will be required to travel to one of these sites to connect with the rail and coach services or use private coach services from local pick up points. Their travel to and from these Accommodation Sites will be managed, with limited to no provisions for private cars, thereby reducing the potential impact upon the highway network. Instead local shuttle services, walking and cycling will be encouraged.

4.9.5 For freight movements, wherever possible, this will be transported to the Moorside Site by rail or sea (via the MOLF) reducing the impact upon the highway network. Any freight movements on the highway network will be required to be undertaken outside of the peak network times.

4.9.6 The quantities of movements for workers and freight is being determined and several scenarios for this being are assessed further through the transport modelling exercise, in order to understand the likely impact upon the highway network from the Moorside Project as a whole.

4.9.7 **Tables 4.8 and 4.9** consider each of these receptors and provide a summary of the predicted effects of the Moorside Project as a whole. The details presented in the tables are based on a preliminary assessment of the predicted residual effects using information available to date and is subject to refinement in the final ES, which will accompany the DCO submission in 2017.

Table 4.8 Summary of predicted residual transport effects – whole project development, construction phase

Receptors	Significance of effects in relation to development at the:							
	Moorside Site	Corkickle Site	Mirehouse Site	Egremont Site	Corkickle to Mirehouse Railway Site	St. Bees Railway Site	Highway Improvement Sites	Whole Moorside Project
Sensitive Receptors	Potentially Significant	Potentially Significant	Potentially Significant	Potentially Significant	No Effects	No Effects	Potentially Significant	Potentially Significant
Network Users	Potentially Significant	Potentially Significant	Potentially Significant	Potentially Significant	Potentially Significant	Potentially Significant	Potentially Significant	Potentially Significant
Transport Infrastructure								
Highways infrastructure (including walking & cycling, buses)	Potentially Significant	Potentially Significant	Potentially Significant	Potentially Significant	Not Significant	Not Significant	Not Significant	Potentially Significant
Rail infrastructure	Potentially Significant	Potentially Significant	Potentially Significant	No Effects	Potentially Significant	Potentially Significant	N/a	Potentially Significant
Marine infrastructure	Potentially Significant	No Effects	No Effects	No Effects	No Effects	No Effects	N/a	Potentially Significant

Table 4.9 Summary of predicted residual transport effects – whole project operation phase

Receptors	Significance of effects in relation to development at the following sites:							
	Moorside Site	Corkickle Site	Mirehouse Site	Egremont Site	Corkickle to Mirehouse Railway Site	St. Bees Railway Site	Highway Improvement Sites	Whole Moorside Project
Sensitive Receptors	Potentially Significant	Potentially Significant	Potentially Significant	Potentially Significant	No effects	No effects	Not Significant	Potentially Significant
Network Users	Potentially Significant	Potentially Significant	Potentially Significant	Potentially Significant	Potentially Significant	Potentially Significant	Potentially Beneficial effects*	Potentially Significant
Transport Infrastructure								
Highways infrastructure (including walking & cycling, buses)	Potentially Significant	Potentially Significant	Potentially Significant	Potentially Significant	Not Significant	Not Significant	Potentially Beneficial effects*	Potentially Significant
Rail infrastructure	Potentially Significant	Potentially Significant	Potentially Significant	No effects	Potentially Significant	Potentially Significant	N/a	Potentially Significant
Marine infrastructure	Potentially Significant	No effects	No effects	No effects	No effects	No effects	N/a	Potentially Significant

* There will be significantly lower trip generation during the Moorside Power Station's operational phase than during the construction phase. As a consequence of the legacy benefit of transport mitigation measures still being in place (for example the Highway Improvements), there are likely to be beneficial effects to network users and receptors, although at this stage it is not possible to determine the level of significance.

4.10 Preliminary assessment of cumulative effects with other developments

4.10.1 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.

4.10.2 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 transport effects, it is considered appropriate at this stage to not consider the following projects on the basis that they are not likely to have a notable impact upon the transportation infrastructure within the Zone of Influence of the Moorside Project Sites or that information on their likely impact is not available to assess:

- 6. Walney Extension Offshore Wind Farm;
- 7. Upgrade of BAe Systems' Barrow Site;
- 8. Biopharmaceutical Manufacturing Facility, Ulverston;
- 9. Heysham New Nuclear Power Station; and
- 10. West Cumbria Tidal Lagoon.

4.10.3 The majority of these sites are located south of the Moorside Site and expected to be accessed via alternative routes to those being used for the Moorside Project and therefore no cumulative impact is expected in relation to transport.

4.10.4 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 transport ZoIs.

4.10.5 Of the remaining developments considered in **Table 3.9**, these are briefly discussed in the context of their likely interaction with respect to transport in the sub-sections below. Each of these sites, together with any of those listed above that emerge as requiring further consideration, will be assessed in detail in the ES in 2017 as further information emerges and a full cumulative assessment of all relative sites can be undertaken.

Sellafield Site Decommissioning (Sellafield Ltd/Nuclear Decommissioning Authority)

4.10.6 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 an increase in traffic associated with the works.

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

4.10.7 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. This will involve the transportation of construction materials along the power line corridor to support the construction of the connection. The nature of this route will mean that there is likely to be reliance upon the same local highway network as the Moorside Project.

4.10.8 It is therefore anticipated that there would be potentially significant cumulative transport effects generated during the construction phase of the Moorside Project from use of the highway network, including journey delay and pedestrian severance.

Whitehaven Coking Coal Project (West Cumbria Mining)

4.10.9 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 Accommodation Site, that has the capacity to have potentially significant cumulative road and rail transportation effects with the Moorside Project.

4.10.10 The location of the site is likely to lead to an increase in traffic on the highway network associated with the transport of materials to and from the site. This will need to be assessed alongside the impacts from the Moorside Project.

4.10.11 In addition, the use of the Cumbrian Coast Line railway will need to be assessed in line with the Moorside Project impact.

Low Level Waste Repository, Drigg (LLWR Ltd)

4.10.12 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.

4.10.13 In addition, this development will be utilising the Cumbrian Coast Railway and as such the cumulative impacts will be assessed for rail.

West Cumbria Water Supply Pipeline (United Utilities)

4.10.14 This will involve the transportation of construction materials along the pipeline route to support the construction of the connection and this could have implications for the primary routes of the Moorside Project and lead to potentially significant effects in terms of road transportation.

4.11 Consideration of additional mitigation

4.11.1 At this stage, all of the mitigation measures, which are anticipated will be required, are incorporated into the development proposals and are considered in the assessment of effects outlined in **Section 4.9**. However, if it emerges during the preparation of the Environmental Statement that additional, non-incorporated measures, need to be considered, the relevant details will be presented in the ES.

4.12 References

1. Institute of Environmental Assessment (1993). Guidelines for the Environmental Assessment of Road Traffic.
2. NuGen (2016). Transport Strategy (Draft).
3. DECC (2011). Overarching National Policy Statement for Energy EN-1
4. DECC (2011). National Policy Statement for Nuclear Power Generation EN-6, Volume I
5. DECC (2011). National Policy Statement for Nuclear Power Generation EN-6, Volume II
6. Cumbria County Council (2011). 3rd Cumbria Local Transport Plan 2011 – 2026
7. DMRB (Volume 11 Section 2 Part 5 (HA 205/08 Assessment and Management of Environmental Effects).
8. Institution of Highways and Transportation (2007). Guidelines for Traffic Impact Assessment.
9. AMEC Foster Wheeler (2015). Moorside Environmental Impact Assessment Scoping Report: Chapter 4.