

West Cumbria Mining Called-In Planning Application

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Cumbrian Metallurgical Coal Project

Shadow Habitats Regulations
Assessment (HRA)

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1 Introduction

Overview

- 1.1 West Cumbria Mining has submitted an application for planning permission to extract from underground, process and export metallurgical (coking) coal at the site of the former Marchon chemical works, which is located to the south of the town of Whitehaven. The proposal involves the development of:
- a new underground metallurgical coal mine and associated development including: the refurbishment of two existing drifts leading to two new underground drifts; coal storage and processing buildings; office and change building; access road; ventilation, power and water infrastructure; security fencing; lighting; outfall to sea; surface water management system and landscaping at the former Marchon site (High Road) Whitehaven;
 - a new coal loading facility and railway sidings linked to the Cumbrian Coast Railway Line with adjoining office / welfare facilities, extension of railway underpass; security fencing; lighting; landscaping; construction of a temporary development compound, and associated permanent access from Mirehouse Road, Pow Beck valley, south of Whitehaven; and
 - a new underground coal conveyor to connect the coal processing buildings with the coal loading facility.
- 1.2 BSG Ecology was appointed as ecological advisor to West Cumbria Mining on this project in December 2015. Following its appointment, BSG Ecology has carried out a range of baseline ecological surveys the results of which have informed subsequent ecological impact assessment.
- 1.3 A planning application was lodged with Cumbria County Council (CCC) on the 31 May 2017, and this included a detailed assessment of the potential ecological impacts arising from the proposed development. The results of this assessment are presented within Chapter 11 of the supporting Environmental Statement (Chapter 11 Ecology, Environmental Statement, West Cumbria Mining 2018).
- 1.4 WYG has been appointed by Cumbria County Council to advise the authority in relation to this planning application. This includes the provision of advice relating to ecology, and the discharging of the council's duties under the Conservation of Habitats and Species Regulations 2017.
- 1.5 WYG has provided a document entitled 'Final Working Draft – HRA Skeleton Structure' (dated 8 December 2017) within which guidance is provided about the scope of a Habitats Regulations Assessment (HRA) that is to be completed in accordance with the requirements of Regulation 63(1) of the Conservation of Habitats and Species Regulations 2017. Reference has been made to this document, although the scope of the proposed works has subsequently changed and so the scope of the assessment has necessarily been amended.
- 1.6 This document provides information that will help Cumbria County Council discharge its duties as the 'competent authority' as defined under Regulation 63(1). It is presented as a shadow Habitats Regulations Assessment.
- 1.7 In support of this report, BSG Ecology has also produced a supplementary document entitled 'Review of adverse effects on terrestrial habitats that may form part of a functional link to the proposed Solway Firth Special Protection Area (pSPA)' (BSG Ecology, 2018), which considers specifically the evidence of whether or not there is a functional link between the Solway Firth pSPA and the proposed development site.

Site description

Terrestrial habitats

- 1.8 A detailed description of the terrestrial habitats within the site is provided in Chapter 11 of the supporting Environmental Statement (Chapter 11 Ecology, section 11.7, Environmental Statement, West Cumbria Mining, 2018).

- 1.9 Habitats within the Main Mine Site comprise a mosaic of poor semi-improved grassland, tall ruderal habitat, dense scrub, bare ground, hard-standing associated with the former Marchon works and a single small pond. Within the areas of poor semi-improved grassland are areas of more species-rich neutral grasslands and some ephemeral-short perennial grassland at the margins of the areas of hard-standing.
- 1.10 Small areas of dense broadleaf tree and scrub habitat are present to the west of the former drift head tunnels and areas of immature broadleaf tree planting and scrub are present along the southern boundary of the main development area.
- 1.11 To the south and west of the Main Mine Site are habitats associated with former landfill sites. This area comprises species-rich damp grassland, species poor-semi-improved grassland, dense scrub and unmanaged hedgerow. A small pond is present in the former landfill area. To the north of the Main Mine Site are further areas of 'brownfield' type habitats associated with the former Marchon works. These habitats are broadly similar to those found within the site.
- 1.12 Habitats in the vicinity of St Bees Head comprise a mosaic of degraded lowland heath, with dense coarse grassland, bracken *Pteridium aquilinum* and tall ruderal vegetation.
- 1.13 The preferred route for the buried conveyor crosses a small access road and two large sheep-grazed fields. After crossing the St Bees Road (B5345) the route crosses an area of broadleaf woodland. Beyond the woodland the route crosses a further area of improved grassland which is intersected by managed and species-poor hedgerow.
- 1.14 The route passes through an area of replanted semi-ancient woodland and beyond this it passes through two further improved pasture grassland fields before reaching the railway line. The conveyor route terminates adjacent to the existing railway.
- 1.15 Habitats associated with the access route into the Rail Loading Facility (RLF) comprise a tarmac track with a narrow margin of poor semi-improved grassland. To the east of the track are small sections of hawthorn dominated hedgerow and open grazing land. A large security gate forms the boundary between the access route and the former Main Band colliery. The colliery site comprises a mosaic of hard-standings, species poor-semi-improved grassland, tall ruderal vegetation, dense bramble scrub and damp ground dominated by rush.
- 1.16 Along the northern boundary of the site is a row of mature conifer and broadleaf trees. The trees mark the edge of the Bell House Gill. Along the southern and south-western boundaries of the former colliery site is a row of mature broadleaf trees comprising sessile oak, silver birch, and alder. Near the north-eastern edge of the wood are three small concrete lined settlement lagoons.
- 1.17 Habitats associated with the land above the areas of proposed on-shore mining comprise a network of mainly arable and intensively grazed pasture fields. Hedgerows are present along the margins of most fields and small areas of broadleaf woodland area also present in places.
- 1.18 Habitats located on the eastern side of the Whitehaven to St Bees railway line, and adjacent to the proposed rail loading facility, comprise a mosaic of improved grazing land, flowing water, semi-improved grassland, tall ruderal vegetation, rush dominated pasture, marsh, unmanaged hedgerows and scattered trees.
- 1.19 Two watercourses are present within this area. The Pow Beck flows in a southerly direction along the eastern edge of the railway embankment. The Scalegill Beck flows approximately 50m to the east of the Pow Beck, eventually joining the Pow Beck. Mature and semi-mature ash, sycamore and alder trees are located alongside the Scalegill Beck.
- 1.20 Stanley Pond is located to the immediate south-east of the small settlement known as Woodend. This is an area of marsh habitat, dominated by common reed.

Marine habitats

- 1.21 A detailed description of the marine habitats within and adjacent to the site is provided in Chapter 17 of the supporting Environmental Statement (Chapter 17 Marine Environment, Section 17.4, Environmental Statement, West Cumbria Mining, 2018).

- 1.22 The sandstone cliffs and rocky shores at St Bees Head provide a wide range of habitats, including horizontal rock platforms, crevices, rock pools and boulder shores with rich marine life in the intertidal and the subtidal fringe. St Bees Head is divided geographically into two Heads, the North Head and the South Head. Between the two Headlands is Fleswick Bay, a shingle beach surrounded by the cliffs of the headland and exposed bedrock and boulders on the low shore. St Bees Bay extends southward from South Head and at the north end of the Bay is Seacote Beach, which comprises a flat sandy beach with a shingle bank on the upper shore.
- 1.23 The Cumbria Coast MCZ is an inshore site which stretches for approximately 27 km along the coast of Cumbria from Whitehaven in the north to the mouth of the Ravenglass estuary in the south and covers an area of approximately 18 km². The majority of the site is intertidal except around St. Bees Head, where the site extends for approximately 1 km seaward of the mean low water springs mark.
- 1.24 St Bees Head supports the best, most extensive and important examples of intertidal rocky shore habitats and communities on the otherwise predominantly sedimentary coastline of north-west England. The site includes extensive intertidal boulder and cobble reefs, locally referred to as 'scars' or 'skears', which support good examples of nationally important honeycomb worm (*Sabellaria alveolata*) reefs.

Development Proposal

- 1.25 A detailed description of the development proposal is presented in Chapter 5 of the Environmental Statement (West Cumbria Mining, 2018). A summary is provided below.
- 1.26 The main elements of the project are:
- Construction and operation of the Main Mine Site (MMS) containing the majority of above ground structures including the processing plant extending to 23 ha;
 - The Underground Conveyor (UC) which is 2.3 km long and 9.2 hectares in extent; this transports the coal from the Main Mine Site to the Rail Loading Facility (RLF);
 - The RLF within the Pow Beck valley north-east of St Bees, lying beside the existing west Cumbrian railway line, including new sidings and coal loading building extending over 7.5 hectares;
 - Construction of new underground cross measure drifts to access coal measures beneath marine and terrestrial environments (MMO licence needed for marine elements);
 - Underground mining activities (MMO licence needed for marine mining element);
 - Installation of temporary surface water silt settlement ponds during the construction phase, to be replaced with permanent drainage including oil and silt traps for the operational phase. Discharge (under Environmental Permit) of excess surface water during the construction, and operational phases. The discharge will continue into the decommissioning and restoration phase, albeit at significantly reduced rates compared to the construction and operational phases
- 1.27 Further details of the key elements of the development, to be known as Woodhouse Colliery, are provided below.

The 'Main Mine Site'

- 1.28 This would be the location of the above ground mine infrastructure. This includes the underground mine access points, buildings for the storage of excavated material from the mine (Run of Mine [ROM]), coal processing facilities, paste plant and product storage, administration buildings and offices, car parks, etc. The main mine site is located on a former industrial site known locally as 'Marchon'. The site was a chemical works which produced detergents. The chemical works closed in 2005 and almost all of the associated structures have been removed. The proposed layout of the Main Mine Site is illustrated on Planning Application Drawing 869/AM/002, and will include areas of landscaping and mixed planting to provide a range of habitats and species.

Access Drifts

- 1.29 Access to the coal measures would in part be gained via the dry upper reaches of the two existing drift tunnels from the main mine site. The existing drift tunnels were developed in the 1950's by the chemical works to access and mine Anhydrite; a mineral used in the production of ingredients for detergents. From the upper sections of the existing drifts, new drifts will be driven to reach the target coal seams. The existing portals into the existing drifts will be refurbished to provide access and egress of mine personnel, equipment, ventilation, supplies and mineral conveyance in and out of the mine to the Main Mine Site.

The onshore mining area

- 1.30 The extent of this area has been determined to safeguard potential sensitive receptors from the effects of any mining subsidence – for example by voluntarily establishing a 'no mine zone' beneath the Cumbria Coast MCZ and the St Bees Head SSSI. The chosen method of working provides extensive flexibility in the layout of the underground workings. Thus, the amount and distribution of settlement at ground level, attributed to the excavations deep beneath, can be readily controlled by varying the mine plan to remove less coal and to achieve, through design, long term stability of the workings. The area proposed to be used for onshore mining is some 187 hectares in extent.

The offshore mining area

- 1.31 The target area for productive offshore mining is bounded by Coal Authority Licence areas shown on Figure 3.1 in Chapter 3 of the Environmental Statement, West Cumbria Mining, 2018. This area is no closer than 1 km from the coast in order to avoid a number of geological faults in this area and to avoid undermining any areas beneath the Marine Conservation Zone (MCZ) boundary. Over the anticipated life of the site, some 50 years of operation, extraction would not extend beyond these boundaries. The extent of the offshore mining area is shown on Figure 3.3 in Chapter 3, Environmental Statement, West Cumbria Mining, 2018.

Conveyor

- 1.32 From the Main Mine Site the processed coal would be transported by a buried conveyor to the RLF. The conveyor would be housed within a sub-surface culvert, installed using a 'cut and cover' technique.

Rail Loading Facility

- 1.33 The RLF is a low rise building constructed alongside and over a new rail sidings to be installed parallel to the existing main line in the Pow Beck Valley.

Operational period / restoration / decommissioning

- 1.34 It is proposed that the mine will be operated for a period of 50 years, within which time metallurgical coal production would peak at up to nearly 2.43 million tonnes per annum. After this period of operation the site would be restored.
- 1.35 At this stage an indicative restoration scheme has been prepared which would be implemented at the end of the 50 year operational period (Chapter 5 Project Description, section 5.6, Environmental Statement, West Cumbria Mining, 2018). The scheme proposes that for the Main Mine Site all buildings and plant, would be removed and the land reinstated to use for ecology and recreation, as illustrated on drawing number 869/AM/042.
- 1.36 The buried conveyor apparatus from Marchon to the Pow Beck valley will be removed, but the concrete encasing structures will remain in situ. The RLF buildings will be removed and the area restored to farmland as it was before the mine started. The sidings will be removed.

- 1.37 It is expected that decommissioning work will take place within the footprint of the development and so no further habitat loss or disturbance is likely outside this area. Potential impacts may arise as a result of pollution: disturbance from noise / vibration is unlikely compared to baseline levels associated with the operational mine site. Decommissioning activities are not likely to result in any further subsidence impacts beyond those identified in the operational phase.

Consultation

- 1.38 WYG has been appointed by Cumbria County Council to advise the authority in relation to this planning application, including the provision of advice relating to the discharging of the council's duties under the Conservation of Habitats and Species Regulations 2017.
- 1.39 WYG has provided a document entitled 'Final Working Draft – HRA Skeleton Structure' (dated 8 December 2017) within which guidance is provided about the scope of a (shadow¹) Habitats Regulations Assessment (HRA) that is to be completed in accordance with the requirements of Regulation 63(1) of the Conservation of Habitats and Species Regulations 2017.
- 1.40 WYG has subsequently provided the document 'West Cumbria Mining – Comments on Shadow HRA v2, 27th March 2018' which sets out further requirements for the scope of the shadow HRA.
- 1.41 A Natural England (NE) Discretionary Advice Service (DAS) meeting was attended by representatives from West Cumbria Mining and BSG Ecology at Natural England's Kendal office on 11 October 2016. A formal response regarding the matters discussed during this meeting was received by West Cumbria Mining on 18 October 2016.
- 1.42 A meeting with Cumbria County Council, WYG ecologists (Penny Ward and Gavin Ward), West Cumbria Mining and Neil Beamsley and Steve Betts from BSG Ecology, took place on Tuesday 6th March 2018, to give WYG the opportunity to provide comments on the ecology documents.
- 1.43 A telephone conference was attended by Neil Beamsley and Steven Betts from BSG Ecology on 14 March 2018. This was also attended by Penny Ward and Gavin Ward from WYG. During this conference, comments made in relation to ecology within the January 2018 Regulation 22 response by WYG were discussed, and agreement reached with regards how the further information requested within the Regulation 22 response could be provided.
- 1.44 Mark Johnston, Senior Marine Advisor, Natural England provided a consultation response dated 23 November 2017 that included the following recommendations:
- 1.45 *'As the West Cumbria Mining land site is close (approximately a mile) from the pSPA boundary it would be expected that a screening assessment (test of likely significant effect) would be undertaken to determine whether the land could be deemed as functionally linked to the pSPA.*
- 1.46 *Functionally-linked land describes areas of land or sea occurring outside of a designated site which nonetheless are considered to be critical to or necessary for the ecological or behavioural functioning of qualifying bird species for which the site has been designated. Thus we would expect the case to be presented in the applicant's supporting information and demonstrated in the HRA that the site is not used for feeding or roosting by significant numbers of any pSPA birds or represents a critical requirement for any pSPA birds i.e. as a roosting or feeding area.*
- 1.47 *Our initial observations after looking at the West Cumbria Mining site is that the likelihood of the site representing an important and significant contribution to the pSPA is small and that the assessment may be undertaken as a desk study without detailed wintering bird survey information. We have detailed our reasoning for determining the likelihood to be low in the points below:*
- *The West Cumbria Mining 'Botanical Survey report Technical Appendix 11.4' did not indicate the presence of habitats which we would expect to be of particular importance to any of the pSPA species - it is largely ex industrial land with rank poor semi improved grassland.*

¹ The HRA is carried out by the decision maker as the competent authority under the Habitats Regulations. The developer is required to submit sufficient scientific evidence to enable the authority to complete the HRA and this evidence is submitted in the form of a 'report to inform' or 'shadow' HRA.

- *The bird species of which the seaward extension boundary is specifically designed to protect are Goosander, Red Throated Diver, Common Scoter. These birds will not be directly utilising or dependent upon land areas.*
 - *South of Maryport, the marine extension of the pSPA stops at the mean low water mark, meaning the intertidal or terrestrial areas of the seaward extension are not included within the pSPA.*
 - *The coastal habitat in the seaward extension area is largely rocky shore (particularly south of Workington) with low levels of usage by waders and geese. This is highlighted by the fact that the WeBs sectors south of the Workington are not counted and online BTO records do not show any surveys between 2015 and 2005 (as far as the online records show).*
 - *Numbers of waders and geese (the species most likely to be dependent upon inland habitat) are concentrated in the existing Solway Flats and Marshes SPA.'*
- 1.48 *'The applicant and competent authority need to determine whether the development site is land functionally-linked to any of the p SPA birds. We would suggest that a desk study/review be undertaken to determine this.'*
- 1.49 *'If there remains significant uncertainty or there appears to be reason to believe the site is important to pSPA birds, then further wintering bird survey information would be required to inform the HRA.'*
- 1.50 *'A desk top study would need to cover the majority of the following:*
- *Existing observations of birds in the site from their consultants, evidenced by the data collected by the consultants;*
 - *Any records from bird clubs or county records;*
 - *Discussions with local experts i.e. WeBs coordinators;*
 - *Analysis of the suitability of the land for p SPA bird species' feeding;*
 - *A proximity study to consider the proximity of the development site to locations known to support p SPA waders or geese; potential for roost site suitability for p SPA birds – for this we would expect*
 - *It should identify the nearest feeding sites, since roost sites are often close to feeding areas.*
 - *See in particular the concern about p SPA gulls above and the suggestion to get hold of the national wintering gull roost surveys. These reports may provide more site specific information of which could be of use to the applicant;*
 - *Any other EIAs done in the area which may look at wintering bird usage.'*
- 1.51 Further correspondence received from John Dixon, Sustainable Development Lead Advisor, Natural England dated 9 March 2018 reports that Natural England 'consider that concerns regarding terrestrial ecology issues (e.g. impacts upon birds) have been addressed'.
- 1.52 The correspondence also included the following:
- 1.53 *'Whilst NE consider that concerns regarding terrestrial ecology issues (e.g. impacts upon birds) have been addressed, concerns regarding the impact of the proposed anhydrite mine water discharge upon the marine environment, particularly upon the Solway Firth pSPA and the Cumbria Coast MCZ, remain.*
- 1.54 *The following information is therefore required:*
- a. *Full details of all potential processes to treat anhydrite mine water taking into account worst case scenario in terms of volume of water and potential pollutants.*
 - b. *Details of Surface Water Management Scheme for surface and storm water during the construction phase of the development.*
 - c. *Modelling of discharge and its impact in the receiving marine environment, detailing changes in salinity levels, water temperature, scouring and sedimentation effects, to ensure they do not fall to levels damaging to marine life and habitats (taking into account point 4).*

- d. Confirmation of size, length and design of proposed outfall pipe.
- e. Contaminants Plan to monitor the chemical composition of the outfall discharge.
- f. Control Plan to ensure discharge can be controlled or stopped if unacceptable contaminant levels are observed.
- g. MCZ Assessment.'

1.55 Natural England (NE) reviewed the sHRA prepared by WCM in April 2018 after it was updated to reflect the removal of the requirement for dewatering of the anhydrite mine. In written advice to WCM dated 25 May 2018, NE stated that, '*Natural England is satisfied that, on the basis of the objective information provided, it can be excluded that the proposed plan or project will have a significant effect on the European designated sites identified within the sHRA and the nationally designated Cumbria Coast MCZ, either individually or in combination with other plans or projects.*'

2 Habitats Regulations Assessment

Legislation

- 2.1 The Conservation of Habitats and Species Regulations 2017, referred to as the 'Habitats Regulations,' transpose the requirements of the European Birds and Habitats Directives² into UK legislation. The Birds Directive aims to protect rare and vulnerable birds and the habitats that they depend upon and this is achieved in part through the classification of Special Protection Areas (SPAs).
- 2.2 The Habitats Directive aims to protect plants, habitats and animals other than birds, and this is achieved in part through the creation of Special Areas of Conservation (SACs). Article 6(1) and (2) of the Habitats Directive require that Member States establish management measures for these areas, to avoid deterioration of their ecological interest. SPAs and SACs include European Marine Sites, which are designated sites below Mean High Water.
- 2.3 The UK is also a contracting party to the Ramsar Convention³, which seeks to protect wetlands of international importance, especially those wetlands utilised as waterfowl habitat. It is UK Government policy (in England this is identified within the National Planning Policy Framework) that all competent authorities should treat Ramsar sites similarly as if they are fully designated European sites.
- 2.4 Collectively, all formally proposed and fully classified or designated SPAs and SACs form a pan-European Union network of protected areas known as Natura 2000. Within this report the term Natura 2000 has been used to include all formally proposed or listed Ramsar sites as well as SPAs and SACs. This term is used interchangeably with the term European sites, which also refers to SACs, SPAs and Ramsar sites

Habitats Regulations Assessment Process

- 2.5 The requirements of the Habitats Regulations with regard to the implications of plans or projects are set out within Regulation 63. The step-based approach implicit within this regulation is referred to as a 'Habitats Regulations Assessment', which is the term that has been used throughout this report.
- 2.6 It is incumbent on any public body (referred to as a competent authority within the Habitats Regulations) to carry out a Habitats Regulations Assessment where they are proposing to carry out a project, implement a plan or authorise another party to carry out a plan or project. Competent authorities are required to record the process undertaken, ensuring that there will be no adverse effects on the integrity of any Natura 2000 site as a result of a plan or project whether alone or in combination with other plans or projects.
- 2.7 The Habitats Regulations are applicable to the proposal to extract, process and export of metallurgic coal at the site of the former Marchon chemical works by the provisions of Regulation 63. In order to ensure that the proposed development is compliant with the requirements of the Habitats Regulations, Cumbria County Council (CCC) appointed WYG to advise the council on the information that is required to inform the Habitats Regulations Assessment.

² Council Directive on the conservation of natural habitats and of wild fauna and flora of 21st May 1992 (92/43/EEC) and Council Directive on the conservation of wild birds of 2nd April 1979 (70/409/EEC) consolidated by the Birds Directive 2009 (2009/147/EC).

³ Convention on wetlands of international importance especially as waterfowl habitat, Ramsar, Iran, 2/2/71 as amended by the Paris protocol of 3/12/92 and the Regina amendments adopted at the extraordinary conference of contracting parties at Regina, Saskatchewan, Canada 28/5 – 3/6/87, most commonly referred to as the 'Ramsar Convention.'

Assessment Stages

2.8 The European Commission has developed guidance in relation to Articles 6(3) and 6(4) of the Habitats Directive⁴, and this recommends a four stage approach to addressing the requirements of these Articles (Table 1). Taking into account this guidance the assessment methodology set out below has been adopted to meet the requirements of the Habitats Directive.

Stage 1 – Screening

2.9 This stage identifies the likely effects of the proposed development on the qualifying features (species and habitats) of any Natura 2000 site, either alone or in combination with other plans or projects. Specifically this stage considers whether these effects are likely to be significant with regard to the conservation objectives of the Natura 2000 site. The development will require 'appropriate assessment' (Stage 2) if it is considered that it is likely to have a significant effect on a Natura 2000 site i.e. where any aspect of it risks an effect on any Natura 2000 site which is significant, i.e. which undermines the site's conservation objectives.

2.10 Stage 1 can be sub-divided as follows:

- Stage 1A: The identification of those European sites that are relevant to the assessment, which may include sites located within the project area but may also include sites located in neighbouring authority areas. This process also includes the analysis of information relating to the European sites, in particular the reasons for their designation (qualifying features), factors affecting their integrity and trends affecting them.
- Stage 1B: The identification of underlying trends, i.e. external influences such as climate change, which could affect the integrity of a European site.
- Stage 1C: The analysis of the proposed development to determine whether it is likely to have a significant effect on any European site. This part of the process also includes the examination of options and alternatives that avoid or reduce the identified effects.
- Stage 1D: The identification of other plans and projects that, when considered in-combination with the proposed development, are likely to result in a significant effect on any European site.

Stage 2 – Appropriate Assessment

2.11 If it is considered that a plan or project is likely to have a significant effect on a European site (as explained above), the requirements of Stage 2 are triggered. This stage considers the effects of the proposed development on the integrity of a European site, alone or in combination with other plans or projects. The assessment should consider the implications for the European site in view of the site's conservation objectives. If adverse effects are identified or may arise, this assessment should also consider measures to mitigate the identified effects. This assessment may not have lacunae and must contain complete, precise and definitive findings capable of removing all reasonable scientific doubt as to the effects of the proposed works on the protected area concerned. All aspects of the project which can, by themselves or in combination with other plans or projects, affect the conservation objectives of that area must be identified in the light of the best scientific knowledge available in the field.

2.12 Consent may then only be granted for the project (without resort to Stages 3 and 4) if the competent authority is convinced of the absence of adverse effects of the project (whether alone or in combination with other plans or projects) on the integrity of all European sites. If mitigation is not possible and adverse effects on a European site's integrity remain or there is a risk that they remain, then the process must proceed to Stage 3.

⁴ European Commission (2001). Assessment of plans and projects significantly effecting Natura 2000 site. Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC. Published November 2001.

Stage 3 – Assessment of alternative solutions

- 2.13 If the risk of adverse impacts cannot be ruled out (e.g. it is not possible to fully mitigate the impacts), this stage requires examination of alternative ways of achieving the objectives of the plan or project that avoid or reduce adverse impacts on the integrity of a Natura 2000 site. Consent could only be potentially granted where there is no alternative solution and where the further Stage 4 is addressed.

Stage 4 – Assessment where no alternative solutions exist and where adverse impacts remain

- 2.14 This stage requires and assesses compensatory measures but only where it is first deemed that the project or plan must proceed for Imperative Reasons of Overriding Public Interest (IROPI).
- 2.15 Within these various stages the Habitats Directive promotes the adoption of a hierarchy of avoidance followed by mitigation and ultimately compensation. Consequently the first step is to ensure that the proposed development avoids negative impacts on European sites. If potential negative impacts are identified and avoidance is not feasible, then mitigation measures need to be applied such that no adverse effect on the integrity of any European site arises.
- 2.16 If impacts cannot be fully mitigated then the plan or project should be rejected or taken forward to Stages 3 and 4.

Table 1: Stages in the Habitats Regulations Assessment process

Stage	Description	Legislative Context
Stage 1: Screening	Assessment of whether a plan or project, either alone or in combination with other plans or projects, is likely to have a significant effect on any Nature 2000 site's qualifying features (habitats and species) / conservation objectives.	Article 6(3) of the Habitats Directive Regulation 63 of the Habitats Regulations
	Stage 1A: The identification of any European site that is relevant to the assessment.	
	Stage 1B: The identification of underlying trends.	
	Stage 1C: The analysis of the proposed development to determine whether it is likely to have a significant effect on any European site.	
	Stage 1D: The identification of other plans and projects that, when considered in-combination with the development proposals, risk a significant effect on any European site.	
Stage 2: Appropriate Assessment	<p>Consider the impacts of the development proposals to determine whether or not it is possible to conclude with certainty that the development will not result in any adverse effect on the integrity of any European site, either alone or in combination with other plans or projects and with reference to the site's conservation objectives. Consider measures to mitigate the identified impacts. Prepare an Appropriate Assessment Report for consultation with key stakeholders including Natural England.</p> <p>Consent may be granted for the project if it is possible to conclude with certainty that the development will not result in any adverse effect on the integrity of any European site, either alone or in combination with other plans or projects.</p>	

Stage	Description	Legislative Context
Stage 3: Assessment of alternative solutions	Assess whether there is any alternative solution to the project i.e. one that better respects European sites. If no such alternative solution exists, the process continues to Stage 4. If there is an alternative solution then the project fails.	Article 6(4) of the Habitats Directive Regulation 64 of the Habitats Regulations
Stage 4: Assessment of IROPI and compensatory measures	Assessing whether a plan or project can be justified as needed for 'imperative reasons of overriding public interest' (IROPI) or permitted on the grounds of human health, public safety or primary beneficial consequences for the environment; and whether adequate compensatory measures can be secured.	Article 6(4) of the Habitats Directive Regulation 64 of the Habitats Regulations

2.17 Table 1 summarises the detail and legislative context for the four HRA stages. In subsequent sections further detail is provided about the method that has been adopted when completing Stages 1 and 2.

Case Law

2.18 A recent HRA judgment released from the Court of Justice of the European Union (People Over Wind and Sweetman, 12 April 2018, C-323/17)) has provided clarification as to when avoidance or reduction (i.e. mitigation) measures can be considered within the HRA process. The headline for the case is:

2.19 *"In the light of all the foregoing considerations, the answer to the question referred is that Article 6(3) of the Habitats Directive must be interpreted as meaning that, in order to determine whether it is necessary to carry out, subsequently, an appropriate assessment of the implications, for a site concerned, of a plan or project, it is not appropriate, at the screening stage, to take account of the measures intended to avoid or reduce the harmful effects of the plan or project on that site".*

2.20 This case means that CCC cannot rely on avoidance or reduction measures that allow a conclusion of 'no likely significant effect' to be reached: instead it is necessary to accept that there is a 'likely significant effect' in the absence of these measures, and move to the next stage, i.e. appropriate assessment, at which point such mitigation measures can be considered.

2.21 Following this decision the Planning Inspectorate has published PINS NOTE 05/2018. This advises that *'the implication of the CJEU judgment is that competent authorities cannot take account of any integrated or additional avoidance or reduction measures when considering at the HRA screening stage whether the plan or project is likely to have an adverse effect on a European Site.'*

2.22 The advice goes further and states that: *'If a measure is being introduced to avoid or reduce an effect on a European site then it can be viewed as mitigation.'* *'[This] can also include 'embedded mitigation' such as a commitment within a development proposal to employing standard methods to prevent run-off from vehicles contaminating watercourses'.*

2.23 The shadow HRA takes into account this judgment. The shadow HRA also takes into account a further judgment in the CJEU case of Holohan & Ors. v An Bord Pleanála, 7 November 2018, C - 461/17. In summary this judgment provides further clarification about the scope of an assessment, requiring that all habitats and species associated with a European site must be considered (irrespective of whether or not they are qualifying features) if impacts on those habitats and species are liable to affect the conservation objectives of the site or if the development will impact on features that are necessary to the conservation of the site's qualifying features.

3 Scope of the Assessment

- 3.1 As previously noted WYG has provided guidance about the scope of a Habitats Regulations Assessment (HRA) that is to be completed in accordance with the requirements of Regulation 63(1) of the Conservation of Habitats and Species Regulations 2017). This guidance is summarised in the following sections using the terminology adopted by WYG.
- 3.2 There are no standard criteria for determining the spatial scope of an HRA and so the decision to include or exclude European sites from an assessment needs to be supported by application of the source-pathway-receptor model, which highlights whether there is any potential pathway that connects development to any European sites. In this case the spatial scope of the assessment is informed by identifying the impacts that could potentially arise as a result of the development, assessing the spatial and temporal scope of those impacts and understanding the effects on sensitive receptors that might arise.
- 3.3 A 25 km zone of influence has been adopted in line with guidance provided by WYG (WYG, 2017). This is considered to be highly precautionary but encompasses all sites that could potentially be affected by those impact mechanisms that are most wide-ranging.
- 3.4 The construction phase of the proposed development will commence with a separate remediation phase (ahead of and not overlapping the main construction works). In the remediation phase, discrete areas of the site will be remediated with each area being covered with a proprietary system to prevent rainwater ingress. The areas that are not being remediated will be left untouched during the remediation works. By protecting the remediated areas from rainfall, there will therefore be no pathway for contaminants to get to the sea as they will be retained within the site (more details are presented in Chapter 5 Project Description, paragraph 5.3.11, West Cumbria Mining 2018; Chapter 12 Hydrology & Hydrogeology, Appendix 12.7 Flood Risk Assessment and Drainage Strategy, Environmental Statement, West Cumbria Mining, 2018, section 6.1.4.1). Furthermore, this means that, at the time the construction works start, there will be no contaminated soils remaining on the site meaning that discharges of surface waters to the sea can be undertaken with relatively straightforward treatment (see Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, Flood Risk Assessment and Drainage Strategy, Environmental Statement, West Cumbria Mining, 2018, section 6.1.4.2). This is all explained in more detail below.

Scope of the Assessment

- 3.5 In the sections below a number of abbreviations have been used as follows:

- MMS = Main Mine Site
- UC = Underground Conveyor
- RLF = Rail Loading Facility
- UM = Underground Mining
- SWD = Surface water drainage

Potential impact mechanisms

- 3.6 WYG has identified a range of potential impacts on Natura 2000 sites that may result from the construction phase of the proposed development:
- Direct loss of or damage to terrestrial habitat – MMS/RLF/UC;
 - Disturbance of marine or terrestrial qualifying species (visual/noise/vibration) – MMS/RLF/UC/UM – N.B risk of subsidence considered separately;
 - Direct loss of or damage to marine habitat or disturbance to marine species from scouring and/or sedimentation from any discharges via the existing Saltom Bay outfall pipe – MMS;
 - Direct loss of or damage to marine habitat or disturbance to marine species from scouring and/or sedimentation from any discharges via Pow Beck catchment;

- Deterioration of marine water quality as a result of sediment-laden surface water run-off via existing Saltom Bay outfall pipe;
- Deterioration of marine water quality as a result of disturbance of contaminated land and mobilisation of pollutants during construction (including remediation works) (including changes in pH, temperature, salinity, and dissolved oxygen) discharged via existing Saltom Bay outfall pipe;
- Deterioration of marine water quality as a result of sediment-laden surface water run-off via Pow Beck catchment;
- Deterioration of marine water quality as a result of mobilisation of pollutants during construction (including changes in pH, temperature, salinity, and dissolved oxygen) discharged via Pow Beck catchment;
- Dust and other airborne contamination of marine and terrestrial habitats – MMS/RLF/UC;
- Subsidence under the terrestrial environment as a result of sub-surface mining activities - UM; and,
- Subsidence under the marine environment as a result of sub-surface mining activities – UM.

3.7 Potential Impacts on Natura 2000 sites resulting from the operational phase of the proposed development:

- Direct loss of or damage to terrestrial habitat – MMS/RLF/UC;
- Disturbance of marine or terrestrial qualifying species (visual/noise/vibration) – MMS/RLF/UC/SWD/UM;
- Direct loss of or damage to marine habitat or disturbance to marine species from scouring and/or sedimentation from any discharges via the existing Saltom Bay outfall pipe – MMS;
- Direct loss of or damage to marine habitat or disturbance to marine species from scouring and/or sedimentation from any discharges via Pow Beck catchment;
- Deterioration of marine water quality as a result of sediment-laden surface water run-off via existing Saltom Bay outfall pipe;
- Deterioration of marine water quality as a result of mobilisation of pollutants (including changes in pH, temperature, salinity, and dissolved oxygen) discharged via existing Saltom Bay outfall pipe;
- Deterioration of marine water quality as a result of sediment-laden surface water run-off via Pow Beck catchment;
- Deterioration of marine water quality as a result of mobilisation of pollutants (including changes in pH, temperature, salinity, and dissolved oxygen) discharged via Pow Beck catchment;
- Dust and other airborne contamination of marine and terrestrial habitats – MMS/RLF;
- Subsidence under terrestrial environment as a result of sub-surface mining activities - UM; and,
- Subsidence under the marine environment as a result of sub-surface mining activities – UM.

3.8 Impacts during the decommissioning phase are expected to be similar to those listed for the operational phase with the exception of subsidence, which will only happen during the operational phase of the development.

3.9 It should be noted that the impact mechanisms listed above have been identified with reference to a previous proposal that involved the dewatering of the existing anhydrite mine and the use of the mine infrastructure to gain access to the metallurgical coal reserves. This is no longer being proposed and the current scheme will involve the use of short sections of the existing drifts and then newly constructed drifts to gain access to the coal seams (Chapter 5 Project Description, Environmental Statement, Section 5.1.3, West Cumbria Mining, 2018).. The sections of the existing drifts that will be used are dry and so will not require dewatering. When constructing new drifts, the tunnelling will involve grouting ahead to seal any faults that might allow water to enter the drifts. Consequently dewatering of the mine will not be required (Chapter 5, Environmental Statement, paragraph 5.3.13, West Cumbria Mining, 2018).

- 3.10 Once they have been worked, the resultant voids will be filled using the mining overburden, which will be transformed into a paste type material, blended with cement (or similar) and water, and then pumped into the mined void spaces, where it will set to a hardness similar to concrete (Chapter 5 Project Description – Appendix D Paste Plant Process, West Cumbria Mining, 2018). It is predicted that this will significantly increase stability and reduce the potential for measurable subsidence⁵ (Chapter 5 Project Description, Appendix B, Subsidence Briefing Note, West Cumbria Mining, 2018).
- 3.11 Seismicity effects⁶ have been considered in a separate document (Chapter 5 Project Description – Appendix G, West Cumbria Mining, 2018). It is concluded that the mining method that will be employed will be low impact in terms of seismicity and consequently the magnitude of any potential seismicity will be negligible. However, as seismicity and subsidence are interlinked effects, the potential risk of associated seismicity arising from subsidence under the terrestrial and marine environments is considered in this HRA.

⁵ Subsidence is lateral or vertical ground movement caused by the sinking, shifting or collapsing of mines.

⁶ Seismicity effects in this context relates to earth tremors that may be triggered as a result of mining activity.

4 Stage 1A: Identification of relevant European sites

Natura 2000 Sites

- 4.1 WYG, acting as ecological advisors to Cumbria County Council as the competent authority, has previously identified the following Natura 2000 sites that are located within 25 km of the proposed development site, and this guidance has been adopted within this assessment (WYG, 2017: distances refer to the closest part of the European site - the locations of these sites are shown on Figure 1 in Section 11):
- Solway Firth Proposed Special Protection Area (pSPA) – 1.16 km to the north-west of the main mine site;
 - River Ehen Special Area of Conservation (SAC) – 3.00 km east of the main mine site;
 - River Derwent and Bassenthwaite Lake SAC – 10.03 km north-east of the main mine site;
 - Lake District High Fells SAC – 10.18 km east of the main mine site;
 - Drigg Coast SAC – 14.45 km south-east of the main mine site;
 - Morecambe Bay and Duddon Estuary Special Protection Area (SPA) – 17.07 km south-east of the main mine site;
 - Morecambe Bay SAC – 18.7 km south-east of the main mine site; and
 - Wast Water SAC – 18.8 km south-east of the main mine site.
- 4.2 With the exception of the Morecambe Bay SAC and the Wast Water SAC (see below), these sites have been scoped into the assessment for the following reasons:
- The designated sites support interest features that are mobile and wide-ranging and which may therefore utilise habitats outside the designated site boundary but within the zone of influence of the proposed development (for example migratory fish and SPA birds).
 - The designated sites support interest features that may be affected by pollutants arising from the proposed development (in particular through discharge to the marine environment and through airborne pollutants).
- 4.3 Morecambe Bay is designated a SAC because it supports important examples of the following Annex I habitats (qualifying features) that are a primary reason for selection of this site:
- Estuaries Mudflats and sandflats not covered by seawater at low tide;
 - Large shallow inlets and bays;
 - Perennial vegetation of stony banks;
 - Salicornia and other annuals colonizing mud and sand;
 - Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*);
 - "Shifting dunes along the shoreline with *Ammophila arenaria* ("white dunes")";
 - "Fixed coastal dunes with herbaceous vegetation ("grey dunes")"; and
 - Humid dune slacks.
- 4.4 The site also support important examples of the following habitats, which are present as a qualifying feature but are not a primary reason for selection of this site:
- Sandbanks which are slightly covered by sea water all the time;
 - Coastal lagoons;
 - Reefs;
 - Embryonic shifting dunes;
 - Atlantic decalcified fixed dunes (*Calluno-Ulicetea*); and

- Dunes with *Salix repens* ssp. *argentea* (*Salicion arenariae*).

4.5 The SAC also supports a population of the following Annex II species that is a primary reason for selection of this site:

- great crested newt *Triturus cristatus*.

4.6 Following a review of the assessments that have been completed by other technical specialists, the Morecambe Bay SAC has been scoped out of the assessment as there is no mechanism whereby this site could be impacted by the proposed development. As the qualifying features of the SAC are 18.7 km south-east of the main mine site at their closest point, the SAC is sufficiently distant that air quality, noise, vibration and, subsidence are all unlikely to affect the qualifying features. Discharges to sea are also unlikely to affect the qualifying features (Chapter 17, Section 17.27.4, Environmental Statement, West Cumbria Mining, 2018). No significant effect is likely even in the absence of this mitigation (and so screening out in this case is consistent with the recent HRA judgment POW-Sweetman vs Coillte, 12 April 2018).judgment.

4.7 Wast Water is designated a SAC because it supports an important example of the following Annex I habitats (qualifying feature) that is a primary reason for selection of this site:

- Oligotrophic to mesotrophic standing waters with vegetation of the *Littorelletea uniflorae* and/or of the *Isoëto-Nanojuncetea*.

4.8 Following a review of the assessments that have been completed by other technical specialists, the Wast Water SAC has been scoped out of the assessment as there is no mechanism whereby this site could be impacted by the proposed development. The SAC is noted for a freshwater habitat but which is not hydrologically linked to the development site, which is 18.8 km south-east of the main mine site at its closest point. No significant effect is likely even in the absence of this mitigation (and so screening out in this case is consistent with the recent HRA judgment POW-Sweetman vs Coillte, 12 April 2018).judgment.

4.9 No other European sites are considered in the HRA as application of the source-pathway-receptor model has not identified any potential pathway that connects the development to these sites. This is due in part to their distance from the development site, their location with respect to prevailing environmental conditions, the mobility of their qualifying features and the relative sensitivity of the qualifying features.

Site Characterisation

4.10 A detailed site characterisation is presented in Appendix 1 and is summarised below.

Solway Firth pSPA

4.11 The Solway Firth is a large estuary on the west coast of Great Britain. The proposed extension encompasses the marine waters west of the existing SPA, between Whitehaven (England) and Wigtown Bay (Scotland). These marine waters are shallow and support extensive areas of intertidal mudflats and sandflats, reefs and sub-tidal sandbanks. The existing SPA is noted for the mudflats, saltmarshes and grazing marshes that are present.

4.12 In winter, the Solway Firth is a stronghold for red-throated diver, common scoter and goosander (qualifying features for the pSPA). An extension to the existing Upper Solway Flats & Marshes SPA is proposed because the proposed extension area supports important wintering populations of these species. In addition, a review in 2001 of the existing SPA showed that the mudflats, saltmarshes and grazing marshes also support important numbers of ringed plover, lapwing, cormorant, black-headed gull, common gull and herring gull (these are proposed additional qualifying features to the existing part of the SPA: Scottish Natural Heritage & Natural England, 2016c).

- 4.13 The Upper Solway Flats & Marshes SPA (which will become part of the Solway Firth SPA) supports populations of European importance of the following Annex 1 species (qualifying features): red-throated diver (*Gavia stellata*), whooper swan (*Cygnus cygnus*), barnacle goose (*Branta leucopsis*), golden plover (*Pluvialis apricaria*) and bar-tailed godwit (*Limosa lapponica*). The pSPA also supports migratory populations of European importance of the following species: pink footed goose (*Anser brachyrhynchus*), shelduck (*Tadorna tadorna*), teal (*Anas crecca*), pintail (*Anas acuta*), shoveler (*Anas clypeata*), scaup (*Aythya marila*), common scoter (*Melanitta nigra*), goldeneye (*Bucephala clangula*), goosander (*Mergus merganser*), oystercatcher (*Haematopus ostralegus*), knot (*Calidris canutus*), ringed plover (*Charadrius hiaticula*), grey plover (*Pluvialis squatarola*), lapwing (*Vanellus vanellus*), dunlin (*Calidris alpina*), sanderling (*Calidris alba*), redshank (*Tringa totanus*), turnstone (*Arenaria interpres*), curlew (*Numenius arquata*), cormorant (*Phalacrocorax carbo*), black-headed gull (*Larus ridibundus*), common gull (*Larus canus*) and herring gull (*Larus argentatus*).
- 4.14 The assessment considers all of the above qualifying features and their supporting habitats.
- 4.15 The proposed conservation objectives seek to protect the areas used by these non-breeding species. The conservation objectives for the Solway Firth proposed SPA (Scottish Natural Heritage & Natural England, 2016b) are:
- To avoid deterioration of the habitats of the qualifying species or significant disturbance to the qualifying species, subject to natural change, thus ensuring that the integrity of the site is maintained in the long-term and it continues to make an appropriate contribution to achieving the aims of the Birds Directive for each of the qualifying species.
 - This contribution will be achieved through delivering the following objectives for each of the site's qualifying features:
 - Avoid significant mortality, injury and disturbance of the qualifying features, so that the distribution of the species and ability to use the site are maintained in the long-term;
 - To maintain the habitats and food resources of the qualifying features in favourable condition.
- 4.16 The conservation objectives for the Upper Solway Flats & Marshes SPA are as follows:
- Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the aims of the Wild Birds Directive, by maintaining or restoring;
 - The extent and distribution of the habitats of the qualifying features
 - The structure and function of the habitats of the qualifying features
 - The supporting processes on which the habitats of the qualifying features rely
 - The population of each of the qualifying features, and,
 - The distribution of the qualifying features within the site.
- 4.17 The qualifying bird species using the site require sufficient food resource to be available. The qualifying species can eat a variety of pelagic and benthic prey and these conservation objectives require that these should be maintained at a level able to support species populations. Some of these prey species have particular habitat requirements and, where this is the case, the conservation objectives require that the site needs to be managed to ensure the extent and quality of the habitats are sufficient to maintain these prey species. These requirements have been considered within this assessment.

River Ehen SAC

- 4.18 The River Ehen forms the outfall from Ennerdale Water and flows some 20 km before reaching the Irish Sea at Sellafield (although the River Ehen SAC itself does not extend to the coast). For much of its upper length the River Ehen is oligotrophic (nutrient-poor) and flows over bryophyte-dominated shingle, pebbles and rock.

- 4.19 The River Ehen is designated a SAC because it supports important populations of freshwater pearl mussel *Margaritifera margaritifera* and Atlantic salmon *Salmo salar* (qualifying features). Whilst salmon is a qualifying feature for the SAC, it also has an important role to play in supporting freshwater pearl mussel as it has a role to play in the life cycle of this species (as does brown trout *Salmo trutta*). The most recent condition assessment concluded that the Ennerdale Water to Keekle confluence SSSI is 'unfavourable declining' due to over-grazing, water abstraction and water pollution. This is resulting in poor recruitment within the freshwater pearl mussel population.
- 4.20 The conservation objectives for the River Ehen SAC are as follows:
- Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring;
 - The extent and distribution of the habitats of qualifying species;
 - The structure and function of the habitats of qualifying species;
 - The supporting processes on which the habitats of qualifying species rely;
 - The populations of qualifying species; and
 - The distribution of qualifying species within the site.

Lake District High Fells SAC

- 4.21 Lake District High Fells is a multi-site SAC consisting of 10 separate sites as follows:
- River Eden & Tributaries SSSI (overlaps the SAC)
 - River Derwent & Tributaries SSSI (overlaps the SAC)
 - Buttermere Fells SSSI
 - Armboth Fells SSSI
 - Skiddaw Group SSSI
 - Helvellyn & Fairfield SSSI
 - Wasdale Screes SSSI (Wast Water is a separate SAC protecting the lake)
 - Scafell Pikes SSSI
 - Pillar & Ennerdale Fells SSSI
 - Honister Crag SSSI
 - Birk Fell SSSI
 - Shap Fells SSSI
- 4.22 Much of the land within the SAC is used as pasture, where sheep grazing is considered to have impacted on the condition of significant parts of the SAC. Less than 1% of the SAC is woodland, and this has been attributed in part to grazing pressure.
- 4.23 The Lake District High Fells is designated a SAC because it supports internationally important examples of the following Annex I habitats:
- Oligotrophic to mesotrophic standing waters with vegetation of the *Littorelletea uniflorae* and/or of the *Isoëto-Nanojuncetea*
 - Northern Atlantic wet heaths with *Erica tetralix*
 - European dry heaths
 - Alpine and Boreal heaths
 - *Juniperus communis* formations on heaths or calcareous grasslands
 - Siliceous alpine and boreal grasslands
 - Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels

- Blanket bogs
- Siliceous scree of the montane to snow levels (*Androsacetalia alpinae* and *Galeopsietalia ladani*)
- Siliceous rocky slopes with chasmophytic vegetation
- Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles
- Species-rich *Nardus* grasslands, on silicious substrates in mountain areas (and submountain areas in Continental Europe)
- Alkaline fens
- Calcareous rocky slopes with chasmophytic vegetation

4.24 The Lake District High Fells SAC also supports the following Annex II species:

- Slender green feather-moss *Drepanocladus (Hamatocaulis) vernicosus*

4.25 The Lake District High Fells SAC comprises ten SSSIs: Armboth Fells SSSI; Birk Fell SSSI; Buttermere Fells SSSI; Helvellyn & Fairfield SSSI; Honister Crag SSSI; Pillar and Ennerdale Fells SSSI; Scafell Pikes SSSI; Shap Fells SSSI; Skiddaw Group SSSI; Wasdale Screes SSSI. The most recent condition assessment for each SSSI has been examined to identify any key issues.

4.26 Where unfavourable condition is reported for these sites, this is attributed to grazing pressure including deer grazing. A significant proportion of all sites are now described as unfavourable recovering, and the recovery of habitats has largely been achieved by removing / reducing grazing impacts. Honister Crag SSSI is reported to be in unfavourable condition in part due to damage to the vegetation through the installation of a via ferrata.

4.27 The conservation objectives for the Lake District High Fells SAC are as follows:

- Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring;
- The extent and distribution of qualifying natural habitats and habitats of qualifying species;
- The structure and function (including typical species) of qualifying natural habitats;
- The structure and function of the habitats of qualifying species;
- The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely;
- The populations of qualifying species; and
- The distribution of qualifying species within the site.

River Derwent and Bassenthwaite Lake SAC

4.28 The Derwent is a large nutrient poor (oligotrophic) river system with high water quality and a natural channel. There is a natural succession of plant communities from source to mouth reflecting a slight increase in nutrient status downstream. The Derwent flows through two lakes (Derwentwater and Bassenthwaite), as does its major tributary the Cocker (Buttermere and Crummock Water). These lakes have a hydrological buffering effect which helps stabilise the flow regimes. Bassenthwaite is a large lake with an extensive catchment and consequently is subject to rapid through-flow of water and moderate nutrient status (mesotrophic). The River Derwent and Bassenthwaite Lake SAC does not itself extend to the coast.

4.29 The River Derwent and Bassenthwaite Lake is designated a SAC because it supports internationally important examples of the following Annex I habitats (qualifying features):

- Oligotrophic to mesotrophic standing waters with vegetation of the *Littorelletea uniflorae* and/or of the *Isoëto-Nanojuncetea*.
- Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation.

- 4.30 The SAC also supports populations of the following Annex II species (qualifying features):
- Marsh fritillary butterfly *Euphydryas (Eurodryas, Hypodryas) aurinia*
 - Sea lamprey *Petromyzon marinus*
 - Brook lamprey *Lampetra planeri*
 - River lamprey *Lampetra fluviatilis*
 - Atlantic salmon *Salmo salar*
 - Otter *Lutra lutra*
 - Floating water-plantain *Luronium natans*
- 4.31 The assessment considers all of the above qualifying features and their supporting habitats.
- 4.32 The River Derwent and Bassenthwaite Lake SAC comprises four SSSIs, the condition of which are summarised below.
- River Derwent and Tributaries SSSI: Just over half the SSSI units are considered to be unfavourable no change and this is due to the presence of signal crayfish and other invasive species, inappropriate riparian management (including grazing) and water pollution.
 - Bassenthwaite Lake SSSI: Nearly 80% of the SSSI units are considered to be unfavourable no change 79.65%, which is principally due to overgrazing and the presence of non-native species, which require control and management.
 - Braithwaite Moss SSSI: Just over half the SSSI units are considered to be unfavourable no change, and this is principally due to under-grazing and inappropriate drain management.
 - Buttermere SSSI: This site is described as being 100% in favourable condition.
- 4.33 The conservation objectives for the River Derwent and Bassenthwaite Lake SAC are as follows:
- Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring;
 - The extent and distribution of qualifying natural habitats and habitats of qualifying species;
 - The structure and function (including typical species) of qualifying natural habitats;
 - The structure and function of the habitats of qualifying species;
 - The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely;
 - The populations of qualifying species; and
 - The distribution of qualifying species within the site.

Drigg Coast SAC

- 4.34 The Drigg Coast SAC extends for almost 11 km along the West Cumbrian coast from Seascale, south towards Bootle. At Ravenglass there is an example of a small, bar-built estuary fed by three rivers (the Irt, Mite and Esk) which discharge through a mouth that has been narrowed by large sand and shingle spits. The sediments within the estuary are largely muddy within the Rivers Irt and Mite, while those of the Esk are sandier, particularly towards the mouth. There is a substantial freshwater influence in the upper reaches of all three rivers. The SAC supports the most extensive sand dune system in Cumbria. As well as both fixed and mobile dunes, there are dune slacks, vegetated shingle, fixed dune grasslands and large areas of dune heath and saltmarsh.
- 4.35 The Drigg Coast is designated a SAC because it supports important examples of the following Annex I habitats (qualifying features):
- Estuaries
 - Atlantic decalcified fixed dunes (*Calluno-Ulicetea*)

- Dunes with *Salix repens* ssp. *argentea* (*Salicion arenariae*)
- Mudflats and sandflats not covered by seawater at low tide
- Salicornia and other annuals colonizing mud and sand
- Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)
- Embryonic shifting dunes
- "Shifting dunes along the shoreline with *Ammophila arenaria* ("white dunes")"
- "Fixed coastal dunes with herbaceous vegetation ("grey dunes")" * Priority feature
- Humid dune slacks

4.36 The Drigg Coast SAC comprises a single SSSI (Drigg Coast SSSI) two thirds of which are described as being in favourable condition. The SSSI condition assessment reports that there are local issues with sea buckthorn and Japanese rose, where scrub is impacting on dune habitat. Lack of grazing is also reported to be an issue in some locations.

4.37 The conservation objectives for the Drigg Coast SAC are as follows:

4.38 Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring;

- The extent and distribution of qualifying natural habitats and habitats of qualifying species;
- The structure and function (including typical species) of qualifying natural habitats;
- The structure and function of the habitats of qualifying species;
- The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely;
- The populations of qualifying species; and
- The distribution of qualifying species within the site.

Morecambe Bay and Duddon Estuary SPA

4.39 Morecambe Bay is the second largest embayment in Britain and has four estuaries – the Wyre, Lune, Kent and Leven. It contains the largest continuous area of intertidal mudflats and sandflats in the UK which supports a variety of infaunal communities including cockle beds. Morecambe Bay supports a wide range of other habitats including large areas of saltmarsh and transitional habitats as well as sand dune systems and coastal lagoons.

4.40 Within Morecambe Bay there are areas of stony reef, which also support blue mussel beds and honeycomb worm *Sabellaria alveolata* reefs. Extensive eelgrass beds are present around Foulney Island and in the south Walney Channel.

4.41 The site qualifies as an SPA as it supports important populations of the following birds listed in Annex 1 of Directive 2009/147/EC (qualifying features):

4.42 Over winter the site regularly supports:

- Whooper swan *Cygnus Cygnus*;
- Little egret *Egretta garzetta*;
- Golden plover *Pluvialis apricaria*;
- Ruff *Calidris pugnax*;
- Bar-tailed godwit *Limosa lapponica*; and
- Mediterranean gull *Larus melancephalus*;

- 4.43 During the breeding season the site regularly supports:
- Common tern *Sterna hirundo*;
 - Sandwich tern *Sterna sandvicensis*; and
 - Little tern *Sternula albifrons*
- 4.44 The site is also used regularly on passage by:
- Pink-footed goose *Anser brachyrhynchus*;
 - Shelduck *Tadorna tadorna*;
 - Oystercatcher *Haematopus ostralegus*;
 - Ringed plover *Charadrius hiaticula*;
 - Red knot *Calidris canutus*;
 - Sanderling *Calidris alba*;
 - Dunlin *Calidris alpina alpina*;
 - Black-tailed godwit *Limosa limosa*;
 - Curlew *Numenius arquata*;
 - Pintail *Anas acuta*;
 - Turnstone *Arenaria interpres*;
 - Redshank *Tringa totanus*; and
 - Lesser black-backed gull *Larus fuscus*.
- 4.45 During the breeding season the site regularly supports:
- Lesser black-backed gull *Larus fuscus*; and
 - Herring gull *Larus argentatus argentatus*.
- 4.46 The site also supports an internationally important assemblage of over 20,000 seabirds (qualifying features) in any season, including: Herring gull *Larus argentatus argentatus*, lesser black-backed gull *Larus fuscus*, sandwich tern *Sterna sandvicensis*, common tern *Sterna hirundo*, little tern *Sternula albifrons*, great egret *Ardea alba*, Spoonbill *Platalea leucorodia*, brent goose *Branta bernicla*, wigeon *Anas penelope*, teal *Anas crecca*, green-winged teal *Anas carolinensis*, mallard *Anas platyrhynchos*, ring-necked duck *Aythya collaris*, common eider *Somateria mollissima*, goldeneye *Bucephala clangula*, red-breasted merganser *Mergus serrator*, cormorant *Phalacrocorax carbo*, lapwing *Vanellus vanellus*, little stint *Calidris minuta*, spotted redshank *Tringa erythropus*, greenshank *Tringa nebularia*, black-headed gull *Chroicocephalus ridibundus*, common gull *Larus canus* and herring gull *Larus argentatus argentatus* (non-breeding).
- 4.47 The Morecambe Bay and Duddon Estuary SPA comprises six component SSSIs the condition of which are summarised below.
- Duddon Estuary SSSI: Over 90% of the component units are described as favourable.
 - Morecambe Bay SSSI: Over 90% of the component units are described as favourable.
 - Lune Estuary SSSI: The whole SSSI is described as favourable.
 - South Walney and Piel Channel Flats SSSI: Over 90% of the component units are described as favourable.
 - Wyre Estuary SSSI: The whole SSSI is described as favourable.
 - Roudsea Wood & Mosses SSSI: The most recent condition assessment concludes that 56.51% of the SSSI units are unfavourable recovering and 46.10% are unfavourable declining. Where unfavourable condition has been identified this has been attributed to woodland management and inappropriate drainage.

- 4.48 The conservation objectives for the Morecambe Bay and Duddon Estuary SPA are as follows:
- 4.49 Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the aims of the Wild Birds Directive, by maintaining or restoring;
- The extent and distribution of the habitats of the qualifying features;
 - The structure and function of the habitats of the qualifying features;
 - The supporting processes on which the habitats of the qualifying features rely;
 - The population of each of the qualifying features; and
 - The distribution of the qualifying features within the site.

5 Stage 1B: Underlying trends

Site conditions

- 5.1 The former Marchon chemicals site closed in 2005. Since then, the site has been progressively demolished, with the majority of the previous building infrastructure associated with the former works now removed. Aerial imagery (Google Earth Pro, accessed 27 July 2018) shows that by 2008 most of the buildings had been removed but large areas of bare unvegetated concrete remain.
- 5.2 Areas of concrete foundations remain together with a small security building at the entrance. In the absence of any site redevelopment it is likely that the existing grassland habitats will become rank, and that scrub and tree cover will increase ultimately resulting in a transition to a scrub / woodland mosaic.

Climate change

- 5.3 It is now widely accepted that the climate is changing as a result of anthropogenic influence, but the nature and magnitude of the resultant changes are difficult to predict. Nevertheless, there is increasing evidence that climate change in the UK will result in increasingly warm dry summers and mild, stormy winters along with rising sea levels. These changes may, in turn, result in impacts on European sites.
- 5.4 Climate change has the potential to result in a wide range of effects including coastal erosion, fluvial and coastal flooding, and changes in species distribution. In the context of the site, changes in rainfall and the regularity of storm events could result in effects on the flow in watercourses that cross the site, which may in turn result in changes in the freshwater inputs to the marine environment.
- 5.5 Ecological survey work carried within the site has not identified any species that are considered to be susceptible to climate change. It is possible that some species that currently have a distribution that is limited to the southern part of the UK could extend their range northwards. For example, Massimino *et al* (2015) show that for a range of bird species the short-term response to recent climate warming has been range expansion.

Coastal processes

- 5.6 A Shoreline Management Plan (SMP) has been prepared that covers the North West England and North Wales area (Halcrow, 2012). This document notes that the coastline between Hodbarrow Point and St Bees Head is cut into the glacial till which dominates the geology along the southern part of this area. Readily erodible till cliffs are present along much of the shoreline, with sand dune systems present at the mouth of the Ravenglass and Duddon estuaries. The northern extent of this area is defined by the more resistant sandstone headland of St Bees Head.
- 5.7 The SMP also reports that studies carried out by Halcrow have identified a mean rate of change at St Bees of 0.01m/year of erosion (from maps dating from 1860 to 2002), with a maximum erosion of 0.12m measured from ortho-rectified aerial photography (1941 to 2002). By comparison the cliffs at St Bees Head are retreating at a very slow rate, through both gradual erosion and rock falls. Studies carried out by Halcrow have identified a mean rate of change of 0.15m/year of erosion (from maps dating from 1860 to 2002), with a maximum erosion of 1.1m measured from ortho-rectified aerial photography (1941 to 2002).
- 5.8 As sea level rises, beach widths in front of defences will narrow and the defences themselves will become increasingly exposed and vulnerable. Sea level rise may therefore necessitate the improvement of defences to provide the same standard of protection along the shoreline. To the south of St Bees Head the main issue that has been identified is the presence of a railway close to the shore, which will require defence management to ensure its continuing operation.

Marine environment

- 5.9 The Irish Sea contains stocks of many commercially important species including fish, crustaceans and shellfish (Chapter 17, Section 17.27.4, Environmental Statement, West Cumbria Mining, 2018). The fishery stocks of many commercially fished species in the Irish Sea are at least partially sustained by the spawning and nursery sites around Cumbria.
- 5.10 The intertidal and subtidal marine environments off and to the south of the Head are protected as part of the Cumbria Coast Marine Conservation Zone (MCZ). The Cumbria Coast MCZ stretches for approximately 27 km along the coast from Whitehaven in the north to the mouth of the Ravenglass estuary in the south (an approximate area of 18 km²). The majority of the site is intertidal except around St. Bees Head, where the site extends for approximately 1 km seaward of the mean low water springs mark. The designation of this area as MCZ will ensure the long-term protection of those features for which it is noted.
- 5.11 Commercial fishing outside the boundary of the MCZ but within UK territorial waters is regulated by the UK Government and European Union. Quotas are set for individual species based on the analysis of relevant data.

Air Quality

- 5.12 The air quality assessment is informed by guidance tools made available by Defra for the purposes of Local Air Quality Management. This includes the consideration of future trends, which are factored into the guidance tools that have been adopted (Chapter 15 Air Quality, Environmental Statement, section 15.1.7, West Cumbria Mining, 2018).
- 5.13 Elevated NO_x as a result of the proposed development is not predicted at St Bees Head SSSI, which is c.285m to the north-west of the proposed development site, but elevated NO_x is predicted at Clint's Quarry SSSI (Chapter 15 Air Quality, Environmental Statement, section 15.4.19, West Cumbria Mining, 2018 - these elevated levels are associated with the proximity of the SSSI to WCM's construction / operation traffic using the A595). Whilst NO_x concentrations within part of Clint's Quarry will exceed the annual mean critical level, the process contribution is small (2% or less of the relevant air quality standard).
- 5.14 Elevated N deposition levels that exceed the air quality standard are predicted at St Bees Head SSSI and Clint's Quarry SSSI (Chapter 15 Air Quality, Environmental Statement, section 15.4.19, West Cumbria Mining, 2018); however, it is also noted that exceedance is predicted in the absence of the development and the process contribution attributable to the development is very small (<1% of the relevant air quality standard) (Chapter 15 Air Quality, Environmental Statement, section 15.6.59, West Cumbria Mining, 2018).

6 Stage 1C: Identification of Likely Significant Effects

Evaluation of Effects

- 6.1 Regulation 63 of the Habitats Regulations requires that the proposed development is assessed to determine whether or not it is likely to have a significant effect on the qualifying features (species and habitats) of any European site, either alone or in combination with other plans or projects. This assessment has considered the different stages of the development, i.e. construction, operation and decommissioning.
- 6.2 A recent HRA judgment (People Over Wind and Sweetman, 12 April 2018, C-323/17) means that avoidance or reduction measures that allow a conclusion of 'no likely significant effect' to be reached cannot be considered at the screening stage. Instead it is necessary to accept that there is a 'likely significant effect' in the absence of these measures, and move to the next stage, i.e. appropriate assessment, at which point such mitigation measures can be considered. This requirement has been considered within this assessment of likely significant effects.
- 6.3 A second recent HRA judgment (Holohan & Ors. v An Bord Pleanála, 7 November 2018, C - 461/17) has also been considered within this assessment. In summary this judgment provides further clarification about the scope of an appropriate assessment, requiring that an appropriate assessment must: catalogue the entirety of habitat types and species for which a site is protected; identify and examine the implications of the project for species present on the SPAs / SACs for which the site has not been listed, provided that those implications are liable to affect the Conservation Objectives of the site (i.e. if they are necessary to the conservation of the habitat types and species listed for the protected area); and consider the implications for habitat types and species to be found outside the SPA / SAC provided that those implications are liable to affect the Conservation Objectives of the SPA / SAC (i.e. if they are necessary to the conservation of the habitat types and species listed for the protected area)..

The role of the land at the development site as 'functionally linked land'

- 6.4 A development has the potential to impact on a European site either directly, for example as a result of land-take, or indirectly, for example as a result of air pollution. When assessing impacts it is important to note that impacts need to be considered on 'functionally linked land'. Functionally linked land can be defined as follows (Chapman & Tyldesley, 2016):
- 6.5 *'the term 'functional linkage' refers to the role or 'function' that land or sea beyond the boundary of a European site might fulfil in terms of ecologically supporting the populations for which the site was designated or classified. Such land is therefore 'linked' to the European site in question because it provides an important role in maintaining or restoring the population of qualifying species at favourable conservation status.'*
- 6.6 In this report consideration has been given to whether or not the site includes land that is functionally linked to the Solway Firth pSPA, which is 1.16 km to the north-west at its closest point and which supports populations of birds some of which have been recorded during survey work completed within the site.
- 6.7 Land at the site is not considered to be functionally linked (i.e. it does not provide an important role in maintaining or restoring the population of qualifying species at favourable conservation status or indeed of (in view of the judgment in C-461/17) any non-qualifying habitats or species which are necessary for the conservation of the qualifying species) to the following European sites for the reasons provided:

- River Ehen Special Area of Conservation (SAC) – The qualifying features of the SAC are specifically associated with freshwater habitat, although salmon will use marine areas for migration and feeding; however, the River Ehen estuary is 11 km from the development site and therefore it is very unlikely that the marine environment adjacent to the development site provides an important role in maintaining or restoring the population of qualifying species at favourable conservation status. The land at the development site supports no suitable habitats for any mobile SAC qualifying features. It is concluded that the land at the development site does not provide an important role in maintaining or restoring the population of qualifying species at favourable conservation status for this SAC nor does it provide an important role in relation to any non-qualifying habitats or species which are necessary for the conservation of the SAC's qualifying species.
- River Derwent and Bassenthwaite Lake SAC – Most of the qualifying features (habitats and mammal, fish and plant species) are specifically associated with freshwater systems (rivers and lakes), which are not present within the land at the development site. Some fish species that are qualifying features (salmon, sea lamprey and river lamprey) are migratory and will use marine areas as part of their life-cycle; however, the River Derwent estuary is 13 km from the development site and therefore it is very unlikely that the marine environment adjacent to the development site provides an important role in maintaining or restoring the population of qualifying species at favourable conservation status. Marsh fritillary, which is also a qualifying species, is dependent on marshy habitats (where the main food plant Devil's-bit-Scabious *Succisa pratensis* is abundant) that are not present within the land at the site; furthermore this species is not likely to travel 10.03 km from the SAC to the land at the site and so a functional link is highly unlikely. It is concluded that the land at the development site does not provide an important role in maintaining or restoring the population of qualifying features at favourable conservation status for this SAC nor does it provide an important role in relation to any non-qualifying habitats or species which are necessary for the conservation of the SAC's qualifying features.
- Lake District High Fells SAC – The qualifying habitats and plant species are 10.18 km from the land at the site. None of these qualifying habitats and species are present within the land at the development site and the separation distance means that a functional link is highly unlikely. It is concluded that the land at the development site does not provide an important role in maintaining or restoring the population of qualifying features at favourable conservation status for this SAC nor does it provide an important role in relation to any non-qualifying habitats or species which are necessary for the conservation of the SAC's qualifying features.
- Drigg Coast SAC – The qualifying features for this SAC are all coastal habitats, none of which are present within the land at the site. The separation distance means that a functional link is highly unlikely. It is concluded that the land at the development site does not provide an important role in maintaining or restoring the population of qualifying features at favourable conservation status for this SAC nor does it provide an important role in relation to any non-qualifying habitats or species which are necessary for the conservation of the SAC's qualifying features.
- Morecambe Bay and Duddon Estuary Special Protection Area (SPA) – The SPA is located 17.07 km from the site, which is sufficiently distant that regular movement of birds between the SPA and the development site is highly unlikely. Furthermore, few qualifying species for this SPA have been recorded within the land at the development site: herring gull, which is also a qualifying species for the Solway Firth pSPA, has been recorded occasionally. Black-headed gull and common gull have been recorded infrequently in low numbers, cormorant has been recorded flying past the land at the development site, and curlew was recorded outside the land at the site to the west on a single occasion. It is concluded that the land at the development site does not provide supporting habitat for the Solway Firth pSPA and therefore by default (because of the significant commuting distance) the site is not likely to provide supporting habitat for the Morecambe Bay and Duddon Estuary SPA either (the development site does not have an important role in maintaining or restoring the population of qualifying species at favourable conservation status for this SPA – BSG Ecology, 2018 and nor does it provide an important role in relation to any non-qualifying habitats or species which are necessary for the conservation of this SPA's qualifying species).

Direct loss of or damage to terrestrial habitat within a European site or functionally linked to a European site

Construction Phase

- 6.8 There is no predicted likely significant effect from the construction phase of this project, either alone or in combination with any other plans or projects, on any European site through damage to terrestrial habitat within a European site or land that is functionally linked to a European site. This conclusion is not reliant on any avoidance or reduction measures and hence it is compliant with People Over Wind.
- 6.9 The ecological impact assessment has concluded that the proposed development will not result in any direct impact to any areas within the boundary of any European site (Chapter 11 Ecology, Section 11.11 et seq, Environmental Statement, West Cumbria Mining, 2018).
- 6.10 Supplementary work carried out by BSG Ecology (BSG Ecology, 2018) concluded that the land at the site does not provide supporting habitat (also known as "functionally linked land") for any European site and its qualifying interest, i.e. the site is not used regularly for feeding or roosting by significant numbers of birds associated with either the Solway Firth pSPA or Morecambe Bay and Duddon Estuary SPA and does not represent a critical requirement for any qualifying species for either site. The same applies to the foreshore area and marine habitat in the vicinity of the site.
- 6.11 In addition the land at the site does not provide an important role in relation to any non-qualifying habitats or species which are necessary for the conservation of these two SPAs' qualifying species.
- 6.12 As there is also no functional link with the River Ehen SAC, River Derwent and Bassenthwaite Lake SAC, Lake District High Fells SAC and Drigg Coast SAC, no impacts through this pathway are likely as a result of the proposed development, i.e. the land at the development site does not represent an important requirement for any qualifying features or non-qualifying habitats or species which are necessary for the conservation of the sites' qualifying features.
- 6.13 In relation to the Solway Firth pSPA, data collected through desk study complemented by survey data collected during various surveys carried out during the period 2015 to 2018 have led to the conclusion that no parts of the land at the development site provide important supporting habitat for pSPA birds. Whilst common gull, herring gull and black-headed gull (pSPA birds) have been recorded within the land at the development site, there is no evidence that the land at the development site has a supporting role for any of these species and hence for the pSPA.
- 6.14 The presence of these gull species is considered to be occasional and opportunistic and reflects the distribution of these species in the wider area (for example there is evidence that large numbers of gulls are considered to be a nuisance in Whitehaven). Within the red line boundary the use of the site by these species has been ad hoc and intermittent with the exception of more regular presence of herring gull at the former Marchon site security building, where observed behaviour indicates that their presence may be linked to feeding by people using the adjacent car park. (BSG Ecology, 2018).
- 6.15 During more than 30 visits to the site at different times of the year, herring gull was only recorded on 6 occasions, supporting the view that it is an occasional visitor (BSG Ecology, 2018; section 3.32). Whilst counts of 42, 59 and 60 herring gull were recorded during the winter site visits, all other observations, both during the winter and at other times, are of much smaller numbers. Breeding bird surveys have found no evidence that herring gull currently breeds within the land at the development site. Whilst a large breeding population of herring gull (649 pairs) is understood to have been present in the 1990s, this was when the Marchon site was operational and consequently large commercial buildings were present at the time (gulls are known to nest on these types of buildings). The conditions within the site have changed significantly following the closure and the clearance of the site. Whilst the pSPA is not noted for breeding herring gull, their potential presence has been considered here as an indicator of likely presence throughout the year.
- 6.16 Herring gull is a qualifying species of the water bird assemblage for the pSPA rather than being a qualifying species in its own right. As the site rarely supports large numbers of herring gull, and as there is no evidence that the site or immediate surrounds is an important roosting or feeding area, it is concluded that the site does not have a functional link with the pSPA.

- 6.17 It is concluded that there is no impact from the proposed development on any European site from direct loss or damage to terrestrial habitat within a European site or to land functionally linked to any European site from the construction phase. As such there is no likely significant effect through this pathway from the project alone and given the absence of impact there is also no likely significant effect through this pathway from the project in combination with other plans or projects.
- 6.18 In summary, the land at the development site does not include any parts of a European site and there is no evidence that it is functionally linked to any European site. It is also concluded that the development of the land at the site will not affect the conservation objectives of any European site by impacting on any habitats or species on land at the development site that are not qualifying features of those sites (as highlighted by the *Holohan & Ors. v An Bord Pleanála* case).

Operation Phase

- 6.19 There is no predicted likely significant effect from the operation phase of this project, either alone or in combination with any other plans or projects, on any European site through damage to terrestrial habitat within a European site or functionally linked to a European site. This conclusion is not reliant on any avoidance or reduction measures and hence it is compliant with People Over Wind.
- 6.20 Habitat loss or damage of terrestrial habitats will only take place during the construction phase of the development. As no further habitat loss is proposed during the operation phase, there is no mechanism by which impacts can occur on terrestrial habitat within a European site or functionally linked to a European site.
- 6.21 It is concluded that there is no impact from the proposed development on any European site from direct loss or damage to terrestrial habitat within a European site or to land functionally linked to any European site from the operation phase. As such there is no likely significant effect through this pathway from the project alone and given the absence of impact there is also no likely significant effect through this pathway from the project in combination with other plans or projects.
- 6.22 In summary, the land at the development site does not include any parts of a European site and there is no evidence that it is functionally linked to any European site. It is also concluded that the development of land at the site will not affect the conservation objectives of any European site by impacting on any habitats or species on land at the development site that are not qualifying features of those sites (as highlighted by the *Holohan & Ors. v An Bord Pleanála* case).

Decommissioning Phase

- 6.23 There is no predicted likely significant effect from the decommissioning phase of this project, either alone or in combination with any other plans or projects, on any European site through damage to terrestrial habitat within a European site or functionally linked to a European site. This conclusion is not reliant on any avoidance or reduction measures and hence it is compliant with People Over Wind.
- 6.24 Habitat loss or damage of terrestrial habitats will only take place during the construction phase of the development. As no further habitat loss is proposed during the decommissioning phase, there is no mechanism by which impacts can occur on terrestrial habitat within a European site or functionally linked to a European site.
- 6.25 It is concluded that there is no impact from the proposed development on any European site from direct loss or damage to terrestrial habitat within a European site or to land functionally linked to any European site from the decommissioning phase. As such there is no likely significant effect through this pathway from the project alone and given the absence of impact there is also no likely significant effect through this pathway from the project in combination with other plans or projects.
- 6.26 In summary, the land at the development site does not include any parts of a European site and there is no evidence that it is functionally linked to any European site. It is also concluded that the development of land at the site will not affect the conservation objectives of any European site by impacting on any habitats or species on land at the development site that are not qualifying features of those sites (as highlighted by the *Holohan & Ors. v An Bord Pleanála* case).

Disturbance (visual / noise / vibration) of marine or terrestrial qualifying species

Construction Phase

Visual:

- 6.27 Data collected through desk study complemented by survey data collected during various surveys carried out during the period 2015 to 2018 have led to the conclusion that no parts of the land at the development site provide important supporting habitat for Solway Firth pSPA birds (see paragraph 6.13 et seq). Whilst common gull, herring gull and black-headed gull (pSPA birds) have been recorded within the land at the development site, there is no evidence that the land at the development site has a supporting role for any of these species and hence for the pSPA (BSG Ecology, 2018).
- 6.28 As it has been concluded that the land at the development site is not functionally linked to the Solway Firth pSPA (or any other European site) and as only a limited range of pSPA birds (qualifying features) has been recorded within the land at the development site, it is concluded that the construction phase of the project is not likely to have a significant effect on the pSPA as a result of visual disturbance.
- 6.29 The River Ehen SAC, River Derwent and Bassenthwaite Lake SAC, Lake District High Fells SAC, Drigg Coast SAC and Morecambe Bay and Duddon Estuary SPA are all more than 3 km from the development site. This is sufficiently distant that visual disturbance of their qualifying features is highly unlikely.
- 6.30 There is no predicted likely significant effect from the construction phase of this project, either alone or in combination with any other plans or projects, on any European site through visual disturbance of qualifying species either within a European site or on land functionally linked to a European site. This conclusion is not reliant on any avoidance or reduction measures and hence it is compliant with People Over Wind.

Noise and Vibration:

- 6.31 The assessment of noise and vibration in the ES has been carried out taking into account designed-in mitigation measures. As the HRA screening test must consider impacts of the project in the absence of avoidance or reduction measures (which is the required approach in compliance with People Over Wind) a precautionary approach has been adopted and it is assumed that noise and vibration is likely to have a significant effect during the construction phase of this project on the Solway Firth pSPA through disturbance (visual / noise / vibration) of the qualifying species.
- 6.32 There is no mechanism by which construction-related noise and vibration can impact on any other European site due to the separation distances: the nearest European site is the River Ehen SAC, which is 3 km to the east, with all remaining European sites being more than 10 km away. There will be no construction related noise and vibration related impacts on marine receptors as no offshore works or mining activities will take place in this phase. These conclusions are not reliant on any avoidance or reduction measures and hence are compliant with People Over Wind.
- 6.33 Taking into account avoidance and reduction measures, the noise and vibration assessment has concluded that, during the construction phase, there are no predicted noise or vibration related changes arising from the proposed development that will impact on the Solway Firth pSPA (Chapter 14 Noise and Vibration, Environmental Statement, section 14.9.4, West Cumbria Mining). The noise assessment has used ecological receptors, such as St Bees Head SSSI which is c.285m to the north-west of the proposed development site, that are closer to the development site than any of the European sites. Consequently it is reasonable to assume that the conclusions of the assessment for St Bees Head SSSI can be applied to the nearest European site and its qualifying features (i.e. the pSPA). When avoidance and reduction measures are taken into account, disturbance impacts are not likely to extend as far as the pSPA, which is the nearest European site (1.1 km away).

- 6.34 Whilst the noise assessment has concluded that there is not likely to be a significant effect on the Solway Firth pSPA (and hence any more distant European sites), this conclusion has been reached taking into account designed-in mitigation measures. As the People Over Wind case requires that avoidance and reduction measures are discounted when assessing likely significant effects, a precautionary approach has been adopted and this pathway has been considered within the Appropriate Assessment below.
- 6.35 Notwithstanding this conclusion, it is clear that no impact on any European site will occur through disturbances to animals within the land at the development site. This is clear since:
- supplementary work carried out by BSG Ecology (BSG Ecology, 2018) concluded that the land at the development site does not provide functionally-linked habitat for any European site, i.e. the site is not considered to be important to or necessary for the ecological or behavioural functioning of qualifying bird species for which the Solway Firth pSPA or Morecambe Bay and Duddon Estuary SPA site has been designated (refer to paragraph 6.4 et seq). This also applies to the foreshore area and marine habitat in the vicinity of the development site. It is also concluded that the development on the land will not affect the conservation objectives of these SPAs by impacting on any habitats or species on land at the development site that are not qualifying features of those SPAs (as highlighted by the *Holohan & Ors. v An Bord Pleanála* case). Consequently the proposed development will not in this way result in the disturbance of birds associated with any European site; and
 - as explained previously (paragraph 6.7 et seq), there is no functional link with the River Ehen SAC (as the River Ehen estuary is 11 km away), River Derwent and Bassenthwaite Lake SAC (as the River Derwent estuary is 13 km away), Lake District High Fells SAC (which is 10.18 km away) and Drigg Coast SAC (which is 14.45 km away), and consequently no impacts are likely as a result of the proposed development on the land at the development site, i.e. the development site does not represent an important requirement for any qualifying feature.

Operation Phase

Visual:

- 6.36 Data collected through desk study complemented by survey data collected during various surveys carried out during the period 2015 to 2018 have led to the conclusion that no parts of the land at the development site provide important supporting habitat for Solway Firth pSPA birds (see paragraph 6.13 et seq). Whilst common gull, herring gull and black-headed gull (pSPA birds) have been recorded within the land at the development site, there is no evidence that the land at the development site has a supporting role for any of these species and hence for the pSPA (BSG Ecology, 2018).
- 6.37 As it has been concluded that the land at the development site is not functionally linked to the Solway Firth pSPA (or any other European site) and as only a limited range of pSPA birds (qualifying features) has been recorded within the land at the development site, it is concluded that the operation phase of the project is not likely to have a significant effect on the pSPA as a result of visual disturbance. During this stage of the development all infrastructure will have been established within the site and the presence of any SPA birds will be despite ongoing visual disturbance associated with the operation of the site.
- 6.38 The River Ehen SAC, River Derwent and Bassenthwaite Lake SAC, Lake District High Fells SAC, Drigg Coast SAC and Morecambe Bay and Duddon Estuary SPA are all more than 3 km from the development site. This is sufficiently distant that visual disturbance of their qualifying features is highly unlikely.
- 6.39 There is no predicted likely significant effect from the operation phase of this project, either alone or in combination with any other plans or projects, on any European site through visual disturbance of qualifying species either within a European site or on land functionally linked to a European site. This conclusion is not reliant on any avoidance or reduction measures and hence it is compliant with People Over Wind.

Noise and Vibration:

- 6.40 The assessment of noise and vibration in the ES has been carried out taking into account designed-in mitigation measures. As the HRA screening test must consider impacts of the project in the absence of avoidance or reduction measures (which is the required approach in compliance with People Over Wind) a precautionary approach has been adopted and it is assumed that noise and vibration is likely to have a significant effect during the operation phase of this project on the Solway Firth pSPA through noise and vibration disturbance of the qualifying species.
- 6.41 There is no mechanism by which operation-related noise or vibration can impact on any other European site due to the separation distances: the nearest European site is the River Ehen SAC, which is 3 km to the east with all remaining European sites being more than 10 km away. This conclusion is not reliant on any avoidance or reduction measures and hence it is compliant with People Over Wind
- 6.42 Taking into account avoidance and reduction measures, the noise and vibration assessment has concluded that, during the operation phase, there are no predicted noise or vibration related impacts arising from the proposed development that will impact on the Solway Firth pSPA (Chapter 14 Noise and Vibration, Environmental Statement, section 14.9.7, West Cumbria Mining). The noise assessment has used ecological receptors that are closer to the development site than any of the European sites, such as St Bees Head SSSI which is c.285m to the north-west of the proposed development site. Consequently it is reasonable to assume that the conclusions of the assessment for St Bees Head SSSI can be applied to the nearest European site and its qualifying features (i.e. the pSPA). When avoidance and reduction measures are taken into account, disturbance impacts are not likely to extend as far as the pSPA, which is the nearest European site (1.1 km away).
- 6.43 Operational phase noise and vibration related impacts are not considered likely on marine receptors as the mining will be undertaken 400m under the sea bed. The effects of underwater sound on fish, invertebrates and other marine fauna have been subject to limited research. However, the noise assessment concludes that it is deemed that there is sufficient information, given an understanding of sound propagation and attenuation and knowledge of the geology overlying the proposed mine, to conclude that there is no real likelihood of significant impacts relating to sound and vibration resulting from the proposed development. (Chapter 17 Marine Environment, Environmental Statement, section 17.32.9 et seq, West Cumbria Mining, 2018).
- 6.44 Whilst the noise assessment has concluded that there is not likely to be a significant effect on the Solway Firth pSPA (and hence any more distant European sites), this conclusion has been reached taking into account designed-in mitigation measures. As the People Over Wind case requires that avoidance and reduction measures are discounted when assessing likely significant effects, a precautionary approach has been adopted and this pathway has been considered within the Appropriate Assessment below.
- 6.45 Notwithstanding this conclusion, it is clear that no impact on any European site will occur through disturbances to animals within the land at the development site. This is clear since:
- supplementary work carried out by BSG Ecology (BSG Ecology, 2018) concluded that the land at the development site does not provide functionally-linked habitat for any European site, i.e. the site is not considered to be important to or necessary for the ecological or behavioural functioning of qualifying bird species for which the Solway Firth SPA (and indeed the Morecambe Bay and Duddon Estuary SPA) site has been designated (refer to paragraph 6.4 et seq). This also applies to the foreshore area and marine habitat in the vicinity of the development site. It is also concluded that the development on the land will not affect the conservation objectives of these SPAs by impacting on any habitats or species on land at the development site that are not qualifying features of those SPAs (as highlighted by the *Holohan & Ors. v An Bord Pleanála* case). Consequently the proposed development will not in this way result in the disturbance of birds associated with any European site; and

- As explained previously (paragraph 6.7 et seq), there is no functional link with the River Ehen SAC (as the River Ehen estuary is 11 km away), River Derwent and Bassenthwaite Lake SAC (as the River Derwent estuary is 13 km away), Lake District High Fells SAC (which is 10.18 km away) and Drigg Coast SAC (which is 14.45 km away), and consequently no impacts are likely as a result of the proposed development on the land at the development site, i.e. the development site does not represent an important requirement for any qualifying feature. It is concluded that the development will not affect the conservation objectives for any European site by impacting on any habitats or species that are not qualifying features of those sites (as highlighted by the *Holohan & Ors. v An Bord Pleanála* case).

Decommissioning Phase

Visual:

- 6.46 Data collected through desk study complemented by survey data collected during various surveys carried out during the period 2015 to 2018 have led to the conclusion that no parts of the land at the development site provide important supporting habitat for Solway Firth pSPA birds (see paragraph 6.13 et seq). Whilst common gull, herring gull and black-headed gull (pSPA birds) have been recorded within the land at the development site, there is no evidence that the land at the development site has a supporting role for any of these species and hence for the pSPA (BSG Ecology, 2018).
- 6.47 As it has been concluded that the land at the development site is not functionally linked to the Solway Firth pSPA (or any other European site) and as only a limited range of pSPA birds (qualifying features) has been recorded within the land at the development site, it is concluded that during the operation phase of the project, if pSPA birds use the site this will be despite the visual disturbance that will be occurring at this time. It therefore follows that any pSPA birds that are still present when decommissioning takes place, will be habituated to visual disturbance.
- 6.48 It is concluded that the decommissioning work is not likely to have a significant effect on the Solway Firth pSPA as a result of visual disturbance. During this stage of the development all above ground infrastructure will be removed from the site and the presence of any SPA birds will be despite ongoing visual disturbance associated with the decommissioning activities.
- 6.49 The River Ehen SAC, River Derwent and Bassenthwaite Lake SAC, Lake District High Fells SAC, Drigg Coast SAC and Morecambe Bay and Duddon Estuary SPA are all more than 3 km from the development site. This is sufficiently distant that visual disturbance of their qualifying features is highly unlikely.
- 6.50 There is no predicted likely significant effect from the decommissioning phase of this project, either alone or in combination with any other plans or projects, on any European site through visual disturbance of qualifying species either within a European site or on land functionally linked to a European site. This conclusion is not reliant on any avoidance or reduction measures and hence it is compliant with People Over Wind.

Noise and Vibration:

- 6.51 Noise and vibration impacts during the decommissioning phase are likely to be similar to those reported for the construction phase.
- 6.52 The assessment of noise and vibration in the ES has been carried out taking into account designed-in mitigation measures. As the HRA screening test must consider impacts of the project in the absence of avoidance or reduction measures (which is the required approach in compliance with People Over Wind) a precautionary approach has been adopted and it is assumed that noise and vibration is likely to have a significant effect during the decommissioning phase of this project on the Solway Firth pSPA through noise and vibration disturbance of the qualifying species.

- 6.53 There is no mechanism by which decommissioning-related noise and vibration can impact on any other European site due to the separation distances: the nearest European site is the River Ehen SAC, which is 3 km to the east, with all remaining European sites being more than 10 km away. No decommissioning phase noise and vibration related impacts are likely on marine receptors as the mining activities will have ceased at this point. These conclusions are not reliant on any avoidance or reduction measures and hence it is compliant with People Over Wind.
- 6.54 Taking into account avoidance and reduction measures, the noise and vibration assessment has concluded that, during the decommissioning phase, there are no predicted noise or vibration related changes arising from the proposed development that will impact on the Solway Firth pSPA (Chapter 14 Noise and Vibration, Environmental Statement, section 14.9.4, West Cumbria Mining). The noise assessment has used ecological receptors, such as St Bees Head SSSI which is c.285m to the north-west of the proposed development site, that are closer to the development site than any of the European sites. Consequently it is reasonable to assume that the conclusions of the assessment for St Bees Head SSSI can be applied to the nearest European site and its qualifying features (i.e. the pSPA). When avoidance and reduction measures are taken into account, disturbance impacts are not likely to extend as far as the pSPA, which is the nearest European site (1.1 km away).
- 6.55 Whilst the noise assessment has concluded that there is not likely to be a significant effect on the Solway Firth pSPA (and hence any more distant European sites), this conclusion has been reached taking into account designed-in mitigation measures. As the People Over Wind case requires that avoidance and reduction measures are discounted when assessing likely significant effects, a precautionary approach has been adopted and this pathway has been considered within the Appropriate Assessment below.
- 6.56 Notwithstanding this conclusion, it is clear that no impact on any European site will occur through disturbances to animals within the land at the development site. This is clear since:
- supplementary work carried out by BSG Ecology (BSG Ecology, 2018) concluded that the land at the development site does not provide functionally-linked habitat for any European site, i.e. the site is not considered to be important to or necessary for the ecological or behavioural functioning of qualifying bird species for which the Solway Firth SPA (or indeed Morecambe Bay and Duddon Estuary SPA) has been designated (refer to paragraph 6.4 et seq). This also applies to the foreshore area and marine habitat in the vicinity of the site. It is also concluded that the development on the land will not affect the conservation objectives of these SPAs by impacting on any habitats or species on land at the development site that are not qualifying features of those SPAs (as highlighted by the *Holohan & Ors. v An Bord Pleanála* case). Consequently the proposed development will not in this way result in the disturbance of birds associated with any European site; and
 - as explained previously (paragraph 6.7 et seq), there is no functional link with the River Ehen SAC (as the River Ehen estuary is 11 km away), River Derwent and Bassenthwaite Lake SAC (as the River Derwent estuary is 13 km away), Lake District High Fells SAC (which is 10.18 km away) and Drigg Coast SAC (which is 14.45 km away), and consequently no impacts are likely as a result of the proposed development on the land at the development site, i.e. the development site does not represent an important requirement for any qualifying feature..

Direct loss of or damage to marine habitat or disturbance to marine species from scouring and/or sedimentation from any discharges via Saltom Bay and Pow Beck

Construction Phase

- 6.57 With reference to the following European sites, there is no likely significant effect from the project (alone or in combination with any other plans or projects) through loss or damage to marine habitat or disturbance to marine species from scouring and / or sedimentation during the construction phase. This is because an impact mechanism is not present or because the separation distance means that effects are highly unlikely (Chapter 17 Marine Environment, Environmental Statement, section 17.9.1, West Cumbria Mining, 2018):

- Lake District High Fells SAC - the qualifying features are all terrestrial and freshwater habitats that will not be affected by changes to marine water quality;
- Drigg Coast SAC – the qualifying features are all marine, intertidal or upper shore habitats that are unlikely to be affected by changes in water quality as the development site is 14.45 km south-east of the main mine site;
- Morecambe Bay and Duddon Estuary Special Protection Area (SPA) – the SPA is 17.07 km south-east of the main mine site and consequently the separation distance means that a significant effect is very unlikely.

6.58 The assessment of scouring and sedimentation effects presented in the Environmental Statement (Chapter 17 Marine Environment, Environmental Statement, section 17.29.8 et seq, West Cumbria Mining, 2018) has been carried out taking into account designed-in and other mitigation measures. As the HRA screening test must consider impacts of the project in the absence of avoidance or reduction measures (which is the required approach in compliance with People Over Wind) a precautionary approach has been adopted and it is assumed that scouring and sedimentation effects are likely to have a significant effect during the construction phase of this project on the following 3 European sites through changes in marine water and habitat quality (caused by scouring or sedimentation) that may impact on the qualifying species:

- Solway Firth Proposed Special Protection Area (pSPA) (which is 1.16 km to the north-west of the main mine site at its closest point) – the birds associated with the pSPA are dependent upon the marine environment and could be affected by scouring or sedimentation;
- River Ehen Special Area of Conservation (SAC) – whilst the qualifying features are mostly associated with freshwater habitats, salmon is anadromous and therefore is dependent on the marine environment (and freshwater pearl mussel is dependent on salmon as a host for its larval stage); scouring and/or sedimentation has the potential to impact on salmon during its passage to marine feeding areas – salmon is a qualifying feature for this SAC and could be affected by scouring or sedimentation (this is a highly precautionary approach as the River Ehen estuary is 11 km from the development site);
- River Derwent and Bassenthwaite Lake SAC – whilst the qualifying features are mostly associated with freshwater habitats, salmon, river lamprey and sea lamprey are anadromous and therefore are dependent on the marine environment; scouring and/or sedimentation has the potential to impact on these species during their passage to marine feeding areas (this is a highly precautionary approach as the River Derwent estuary is 13 km from the development site).

6.59 This is the case, despite the following avoidance and reduction measures, due to the decision in People over Wind, which prevents reliance on such measures when applying the likely significant effect test:

6.60 During the remediation of the development site no surface water discharge is likely. Areas being worked will be covered to prevent rainwater ingress (where necessary), which will prevent surface water drainage from these areas. For other parts of the site there will be a state of no change (Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, Flood Risk Assessment and Drainage Strategy, section 6.1.4.1, Environmental Statement, West Cumbria Mining, 2018; Chapter 17 Marine Environment, Environmental Statement, section 17.29.6 et seq, West Cumbria Mining, 2018).

Discharges via Saltom Bay (from the Main Mine Site)

6.61 Following the completion of remediation works, during the remaining part of the construction phase of the proposed development, reuse of surface water within the site will minimise surface water runoff and subsequent discharge to sea. However, following heavy rainfall excess surface water runoff will need to be discharged to sea via the existing outfall in Saltom Bay. The discharge pipe runs down the foreshore and terminates in the intertidal zone (it is only fully exposed around low water springs tides).

6.62 In order to minimise potential scour, the maximum flow rate of the discharge at Saltom Bay will be limited to 25 l/s, which will only be reached during and following heavy rainfall events. In periods of heavy rainfall, flows will be attenuated on site through storage (Chapter 12 Hydrology &

Hydrogeology, Appendix 12.7, Flood Risk Assessment and Drainage Strategy, section 6.1.4.2 et seq, Environmental Statement, West Cumbria Mining, 2018).

- 6.63 Modelling work carried out to inform the marine assessment has concluded that the proposed maximum flow rate is below the threshold for sediment mobility at the discharge point in Saltom Bay, i.e. no significant sediment re-suspension is likely (Chapter 17 Marine Environment, Environmental Statement, section 17.29.8, West Cumbria Mining, 2018). When this discharge point is exposed (i.e. not submerged), modelling results indicate that the proposed flow rate would be sufficient to mobilise fine sand material. However, the sediments at the Saltom Bay discharge point location consist of coarse sands (and cobbles and boulders), and so any re-suspended particles are likely to settle out very quickly. It is concluded that any effect on water quality and biota will be localised and of minor significance (Chapter 17 Marine Environment, Environmental Statement, section 17.29.9, West Cumbria Mining, 2018).
- 6.64 The proposed development will minimise the potential for scour on the intertidal area around the Saltom Bay outfall by limiting, wherever practicable, surface water discharge to when the outlet point is submerged. By only discharging surface water when the outlet point is submerged, the potential for scour at the proposed flow rates will be minimised (Chapter 17 Marine Environment, Environmental Statement, section 17.29.10, West Cumbria Mining, 2018).

Discharges via Pow Beck (from the conveyor and RLF)

- 6.65 Discharge and control measures will be adopted at the conveyor and rail loading facility sites (Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, sections 6.2 and 6.3, Flood Risk Assessment and Drainage Strategy, Environmental Statement, West Cumbria Mining, 2018; Sections 5.7 and 5.10 of the Draft Environmental Management Plan - Appendix E to Chapter 5 Project Description, Environmental Statement, West Cumbria Mining, 2018).
- 6.66 Bellhouse Gill and an unnamed tributary of the Pow Beck (both ephemeral watercourses) are intersected by the conveyor route. The conveyor will be buried beneath these two ephemeral watercourses. During the construction phase, the watercourses will be diverted around the construction area. There will therefore be no increases in flow rates or discharge volumes to Pow Beck, and hence no impacts at St Bees beach due to scour are predicted.
- 6.67 During the construction phase, surface water runoff at the rail loading facility (RLF) site will be retained on-site in attenuation lagoons. Surface discharges to Pow Beck will be at a reduced rate compared to the current greenfield runoff rates. Whilst runoff volume will increase due to the increase in impermeable area, this excess volume will be discharged slowly after the peak flow has passed and will not increase flood flow rates in the Pow Beck. Impacts associated with scour at the mouth of the Pow Beck are therefore not predicted to occur (Chapter 17 Marine Environment, Environmental Statement, sections 17.29.20 to 17.29.23, West Cumbria Mining, 2018).
- 6.68 It can be seen from the above that measures are to be put in place to minimise any scouring or sedimentation impacts on the marine environment during the construction phase. However, the People Over Wind case requires that avoidance and reduction measures are discounted when assessing likely significant effects.
- 6.69 As already explained above, the land at the development site does not include any part of a European site and there is no evidence that it is functionally linked to any European site. This applies also to the foreshore area and marine habitat in the vicinity of the site, i.e. within the zone of influence of the Saltom Bay outfall, which is estimated to be 162m (Chapter 17 Marine Environment, paragraph 17.29.17, Environmental Statement, 2018; this represents a “combined” zone of influence, comprising the area affected by the proposed WCM development discharge) or within the vicinity of the Pow Beck where it discharges to sea. Hence any scouring / sedimentation from the construction phase will not have any impact on any European site through any “functional link” pathway. It is concluded that the development will not affect the conservation objectives for any European site by impacting on any habitats or species that are not qualifying features of those sites (as highlighted by the *Holohan & Ors. v An Bord Pleanála* case).

Operation Phase

- 6.70 With reference to the following European sites, there is no likely significant effect from the project (alone or in combination with any other plans or projects) through loss or damage to marine habitat or disturbance to marine species from scouring and / or sedimentation during the operation phase. This is because an impact mechanism is not present or because the separation distance means that effects are highly unlikely (Chapter 17 Marine Environment, Environmental Statement, section 17.9.1, West Cumbria Mining, 2018):
- Lake District High Fells SAC - the qualifying features are all terrestrial habitats that will not be affected by changes to marine water quality;
 - Drigg Coast SAC – the qualifying features are all marine, intertidal or upper shore habitats that are unlikely to be affected by changes in water quality as the development site is 14.45 km south-east of the main mine site;
 - Morecambe Bay and Duddon Estuary Special Protection Area (SPA) – the SPA is 17.07 km south-east of the main mine site and consequently the separation distance means that a significant effect is very unlikely.
- 6.71 The assessment of scouring and sedimentation effects presented in the Environmental Statement (Chapter 17 Marine Environment, Environmental Statement, section 17.31.3 et seq, West Cumbria Mining, 2018) has been carried out taking into account designed-in and other mitigation measures. As the HRA screening test must consider impacts of the project in the absence of avoidance or reduction measures (which is the required approach in compliance with People Over Wind) a precautionary approach has been adopted and it is assumed that scouring and sedimentation effects are likely to have a significant effect during the construction phase of this project on the following 3 European sites through changes in marine water and habitat quality (caused by scouring or sedimentation) that may impact on the qualifying species:
- Solway Firth Proposed Special Protection Area (pSPA) (which is 1.16 km to the north-west of the main mine site at its closest point) – the birds associated with the pSPA are dependent upon the marine environment and could be affected by scouring or sedimentation;
 - River Ehen Special Area of Conservation (SAC) – whilst the qualifying features are mostly associated with freshwater habitats, salmon is anadromous and therefore is dependent on the marine environment (and freshwater pearl mussel is dependent on salmon as a host for its larval stage); scouring and/or sedimentation has the potential to impact on salmon during its passage to marine feeding areas – salmon is a qualifying feature for this SAC and could be affected by scouring or sedimentation (this is a highly precautionary approach as the River Ehen estuary is 11 km from the development site);
 - River Derwent and Bassenthwaite Lake SAC – whilst the qualifying features are mostly associated with freshwater habitats, salmon, river lamprey and sea lamprey are anadromous and therefore are dependent on the marine environment; scouring and/or sedimentation has the potential to impact on these species during their passage to marine feeding areas (this is a highly precautionary approach as the River Derwent estuary is 13 km from the development site).
- 6.72 This is the case, despite the following avoidance and reduction measures, due to the decision in People over Wind, which prevents reliance on such measures when applying the likely significant effect test:

Discharges via Saltom Bay (from the Main Mine Site)

- 6.73 All surface water from areas of hard-standing and roofs will be captured during the operation phase and directed (via oil interceptors and silt traps) to an underground storage tank⁷ for testing prior to discharge to sea using the existing outfall. Water will be discharged using the existing outfall at a maximum flow rate of 25 l/s. In periods of heavy rainfall, flows will be attenuated on site through storage (Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, Flood Risk Assessment and Drainage Strategy, section 6.1.4.3 et seq, Environmental Statement, West Cumbria Mining, 2018);

⁷ The surface water attenuation tank is concealed under the bunding to the north of the site (Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, Flood Risk Assessment and Drainage Strategy, section 6.1.4.3, Environmental Statement, West Cumbria Mining, 2018).

Chapter 17 Marine Environment, Environmental Statement, section 17.31, West Cumbria Mining, 2018). All other pollutants will be controlled through the adoption of best practice measures (Draft Environmental Management Plan - Appendix E to Chapter 5 Project Description, Sections 5.7 and 5.10, Environmental Statement, West Cumbria Mining, 2018).

- 6.74 During the operational phase it is expected that there will be significant consumption of attenuated surface water for mining related activities, such as washing coal and preparation of the paste for backfill. It is therefore expected that the discharge of surface water will be significantly lower than the consented discharge rate (Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, Flood Risk Assessment and Drainage Strategy, section 6.1.4.3, Environmental Statement, West Cumbria Mining, 2018).
- 6.75 In order to minimise potential scour, the maximum flow rate of the discharge will be limited to 25 l/s, which will only be reached during and following heavy rainfall events. In periods of heavy rainfall, flows will be attenuated on site through storage (Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, Flood Risk Assessment and Drainage Strategy, section 6.1.4.3, Environmental Statement, West Cumbria Mining, 2018).
- 6.76 Modelling work carried out to inform the marine assessment has concluded that the proposed maximum flow rate is below the threshold for sediment mobility at the discharge point, i.e. no significant sediment re-suspension is likely (Chapter 17 Marine Environment, Environmental Statement, section 17.31.3, West Cumbria Mining, 2018). When the discharge point is exposed (i.e. not submerged), modelling results indicate that the proposed flow rate would be sufficient to mobilise fine sand material. However, the sediments at the discharge point location consist of coarse sands (and cobbles and boulders), and so any re-suspended particles are likely to settle out very quickly. It is concluded that any effect on water quality and biota will be localised and of minor significance (Chapter 17 Marine Environment, Environmental Statement, section 17.31.4, West Cumbria Mining, 2018).
- 6.77 The proposed development will minimise the potential for scour on the intertidal area around the Saltom Bay outfall by limiting, wherever practicable, surface water discharge to when the outlet point is submerged. By only discharging surface water when the outlet point is submerged, the potential for scour at the proposed flow rates will be minimised.

Discharges via Pow Beck (from the conveyor and RLF)

- 6.78 Discharge and control measures will be adopted at the conveyor and rail loading facility sites (Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, sections 6.2 and 6.3, Flood Risk Assessment and Drainage Strategy, Environmental Statement, West Cumbria Mining, 2018; Sections 5.7 and 5.10 of the Draft Environmental Management Plan - Appendix E to Chapter 5 Project Description, Environmental Statement, West Cumbria Mining, 2018).
- 6.79 The conveyor will be buried beneath two ephemeral watercourses during the construction phase. After construction, the conveyor box will be backfilled with low permeability material in a way that will minimise ingress and tracking of surface water along the outside of the box structure. At this point the difference between the flow regimes pre and post construction is expected to be negligible (Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, Flood Risk Assessment and Drainage Strategy, section 6.2.1.2, Environmental Statement, West Cumbria Mining, 2018). There will therefore be no increases in flow rates or discharge volumes to Pow Beck, and hence no impacts at St Bees beach due to scour are predicted (Chapter 17 Marine Environment, Environmental Statement, section 17.32.7, West Cumbria Mining, 2018).
- 6.80 During the operational phase, surface water runoff at the rail loading facility (RLF) site will be retained on-site in attenuation lagoons. Surface discharges to Pow Beck will be at a reduced rate compared to the current greenfield runoff rates. Whilst runoff volume will increase due to the increase in impermeable area, this excess volume will be discharged slowly after the peak flow has passed and will not increase flood flow rates in the Pow Beck. Impacts associated with scour at the mouth of the Pow Beck are therefore not predicted to occur (Chapter 17 Marine Environment, Environmental Statement, sections 17.32.4, West Cumbria Mining, 2018).
- 6.81 It can be seen from the above that measures are to be put in place to minimise any scouring or sedimentation impacts on the marine environment during the operational phase. However the

People Over Wind case requires that avoidance and reduction measures are discounted when assessing likely significant effects.

- 6.82 As already explained above, the land at the development site does not include any part of a European site and there is no evidence that it is functionally linked to any European site. This applies also to the foreshore area and marine habitat in the vicinity of the site, i.e. within the zone of influence of the Saltom Bay outfall, which is estimated to be 162m (Chapter 17 Marine Environment, paragraph 17.29.17, Environmental Statement, 2018) or within the vicinity of the Pow Beck where it discharges to sea. Hence any scouring / sedimentation from the operational phase will not have any impact on any European site through any “functional link” pathway. It is concluded that the development will not affect the conservation objectives for any European site by impacting on any habitats or species that are not qualifying features of those sites (as highlighted by the *Holohan & Ors. v An Bord Pleanála* case).

Decommissioning Phase

- 6.83 With reference to the following European sites, there is no likely significant effect from the project (alone or in combination with any other plans or projects) through loss or damage to marine habitat or disturbance to marine species from scouring and / or sedimentation during the decommissioning phase. This is because an impact mechanism is not present or because the separation distance means that effects are highly unlikely (Chapter 17 Marine Environment, Environmental Statement, section 17.9.1, West Cumbria Mining, 2018):

- Lake District High Fells SAC - the qualifying features are all terrestrial habitats that will not be affected by changes to marine water quality;
- Drigg Coast SAC – the qualifying features are all marine, intertidal or upper shore habitats that are unlikely to be affected by changes in water quality as the development site is 14.45 km south-east of the main mine site;
- Morecambe Bay and Duddon Estuary Special Protection Area (SPA) – the SPA is 17.07 km south-east of the main mine site and consequently the separation distance means that a significant effect is very unlikely.

- 6.84 The assessment of scouring and sedimentation effects presented in the Environmental Statement (Chapter 17 Marine Environment, Environmental Statement, section 17.33.7 et seq, West Cumbria Mining, 2018) has been carried out taking into account designed-in and other mitigation measures. As the HRA screening test must consider impacts of the project in the absence of avoidance or reduction measures (which is the required approach in compliance with People Over Wind) a precautionary approach has been adopted and it is assumed that scouring and sedimentation effects are likely to have a significant effect during the decommissioning phase of this project on the following 3 European sites through changes in marine water and habitat quality (caused by scouring or sedimentation) that may impact on the qualifying species:

- Solway Firth Proposed Special Protection Area (pSPA) (which is 1.16 km to the north-west of the main mine site at its closest point) – the birds associated with the pSPA are dependent upon the marine environment and could be affected by scouring or sedimentation;
- River Ehen Special Area of Conservation (SAC) – whilst the qualifying features are mostly associated with freshwater habitats, salmon is anadromous and therefore is dependent on the marine environment (and freshwater pearl mussel is dependent on salmon as a host for its larval stage); scouring and/or sedimentation has the potential to impact on salmon during its passage to marine feeding areas – salmon is a qualifying feature for this SAC and could be affected by scouring or sedimentation (this is a highly precautionary approach as the River Ehen estuary is 11 km from the development site);

- River Derwent and Bassenthwaite Lake SAC – whilst the qualifying features are mostly associated with freshwater habitats, salmon, river lamprey and sea lamprey are anadromous and therefore are dependent on the marine environment; scouring and/or sedimentation has the potential to impact on these species during their passage to marine feeding areas (this is a highly precautionary approach as the River Derwent estuary is 13 km from the development site).

6.85 This is the case, despite the following avoidance and reduction measures, due to the decision in People over Wind, which prevents reliance on such measures when applying the likely significant effect test:

Discharges via Saltom Bay (from the Main Mine Site)

6.86 All surface water from areas of hard-standing and roofs will be captured during the decommissioning phase and directed via silt traps and oil interceptors to the underground water storage tank for testing prior to discharge to sea using the existing outfall. However, the interception of surface water will change during the decommissioning phase as building and other infrastructure are removed.

6.87 Water which has passed through oil and silt traps will be discharged using the existing outfall at a maximum flow rate of 25 l/s. In periods of heavy rainfall, flows will continue to be attenuated on site through storage (Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, Flood Risk Assessment and Drainage Strategy, section 6.1.4.4, Environmental Statement, West Cumbria Mining, 2018). All other pollutants will be controlled through the adoption of best practice measures (Draft Environmental Management Plan - Appendix E to Chapter 5 Project Description, Sections 5.7 and 5.10, Environmental Statement, West Cumbria Mining, 2018; Chapter 17 Marine Environment, Environmental Statement, section 17.33.6, West Cumbria Mining, 2018).

Discharges via Pow Beck (from the conveyor and RLF)

6.88 During the decommissioning phase discharge and control measures will be adopted at the conveyor and rail loading facility sites (Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, sections 6.2 and 6.3, Flood Risk Assessment and Drainage Strategy, Environmental Statement, West Cumbria Mining, 2018; Sections 5.7 and 5.10 of the Draft Environmental Management Plan - Appendix E to Chapter 5 Project Description, Environmental Statement, West Cumbria Mining, 2018).

6.89 It is expected that the drainage infrastructure will remain in place and continue to function, although removing the buildings and ceasing operation would reduce the runoff and sediment generation from the site. If all the infrastructure is removed, including the drainage system, then the site would revert to its pre-development state.

6.90 As noted above in respect of the operational phase, the difference between the flow regimes pre and post construction of the conveyor is expected to be negligible (Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, Flood Risk Assessment and Drainage Strategy, section 6.2.1.2, Environmental Statement, West Cumbria Mining, 2018). There will therefore be no increases in flow rates or discharge volumes to Pow Beck during the operational or the decommissioning phases, and hence no impacts at St Bees beach due to scour are predicted (Chapter 17 Marine Environment, Environmental Statement, section 17.32.7, West Cumbria Mining, 2018).

6.91 During the decommissioning phase the storage lagoons, wetland, drainage pipes and outfalls to receiving watercourses that serve the RLF will remain. Discharge rates from the restored site will be reduced compared to the operational phase, as the impermeable surfaces will be removed and replaced by more retentive naturalised catchment. As already explained above, the land at the development site does not include any part of a European site and there is no evidence that it is functionally linked to any European site. This applies also to the foreshore area and marine habitat in the vicinity of the site, i.e. within the zone of influence of the Saltom Bay outfall, which is estimated to be 162m (Chapter 17 Marine Environment, paragraph 17.29.17, Environmental Statement, 2018) or within the vicinity of the Pow Beck where it discharges to sea. Hence any scouring / sedimentation from the decommissioning phase will not have any impact on any European site through any “functional link” pathway. It is concluded that the development will not affect the conservation objectives for any European site by impacting on any habitats or species

that are not qualifying features of those sites (as highlighted by the *Holohan & Ors. v An Bord Pleanála* case).

Deterioration of marine water quality from any discharges via Saltom Bay and Pow Beck

Construction Phase

- 6.92 With regard to the following European sites, there is no likely significant effect from deterioration of marine water quality from marine discharges during the construction phase either because an impact mechanism is not present or because the separation distance means that effects are highly unlikely (Chapter 17 Marine Environment, Environmental Statement, section 17.9.1, West Cumbria Mining, 2018):
- Lake District High Fells SAC - the qualifying features are all terrestrial habitats that will not be affected by changes to marine water quality;
 - Drigg Coast SAC – the qualifying features are all marine, intertidal or upper shore habitats that are unlikely to be affected by changes in water quality as the development site is 14.45 km south-east of the main mine site; and
 - Morecambe Bay and Duddon Estuary Special Protection Area (SPA) – the SPA is 17.07 km south-east of the main mine site and consequently the separation distance means that a significant effect is very unlikely.
- 6.93 However, during the construction phase of the development, it is possible that discharges arising from the development site could have an adverse effect on marine water quality, for example as a result of pollution (such as silt, oil or concrete) or through changes in the pH, salinity, temperature or dissolved oxygen of the receiving sea water. In the absence of mitigation measures it is therefore possible that the following European sites could be affected and therefore it is acknowledged that this project, alone, is likely to have a significant effect on the following European sites:
- Solway Firth Proposed Special Protection Area (pSPA) – the birds associated with the pSPA are dependent upon the marine environment and could be affected by marine discharges;
 - River Ehen Special Area of Conservation (SAC) – whilst the qualifying features are mostly associated with freshwater habitats, salmon is anadromous and therefore is dependent on the marine environment (and freshwater pearl mussel is dependent on salmon as a host for its larval stage) and could be affected by marine discharges;
 - River Derwent and Bassenthwaite Lake SAC – whilst the qualifying features are mostly associated with freshwater habitats, salmon, river lamprey and sea lamprey are anadromous and therefore are dependent on the marine environment and could be affected by marine discharges.
- 6.94 This is the case, despite the following avoidance and reduction measures, due to the decision in *People over Wind* which prevents reliance on such measures when applying the likely significant effect test:
- 6.95 Prior to the main construction period it is planned that a 6 month remediation phase will be required to treat pockets of contamination which may remain in areas of the site. During the remediation works, working areas will be fully covered with proprietary cover systems to prevent rainwater ingress. This will ensure that no contaminants are mobilised or transported by surface water. Areas of the site which are not being remediated will continue to drain as they do currently (Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, Flood Risk Assessment and Drainage Strategy, Section 6.1.4.1, Environmental Statement, West Cumbria Mining, 2018).
- 6.96 Once the remediation phase is complete, there will be no legacy contaminants on site. Consequently there will be no mechanism whereby surface water contamination could be discharged into the marine environment.
- 6.97 Pollution effects during the construction phase of the development will be fully mitigated through best practice measures that will be adopted by the appointed contractor. This includes the collection and settlement of surface water and the adoption of best practice pollution prevention measures (Draft Environmental Management Plan - Appendix E to Chapter 5 Project Description,

Sections 5.7 and 5.10, Environmental Statement, West Cumbria Mining, 2018). Discharges during the construction phase will be temporary in nature, i.e. they will only occur for the duration of the construction period, which is expected to be about 2 years, and at times when rainfall cannot be used in the construction processes (for example concrete mixing, damping down of roads and stockpiles etc).

Discharges via Saltom Bay (from the Main Mine Site)

- 6.98 Temporary settlement lagoons will be installed to collect surface water prior to discharge to remove potential suspended solids and ensure that discharge permit levels are met (Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, Flood Risk Assessment and Drainage Strategy, Section 6.1.4.2, Environmental Statement, West Cumbria Mining, 2018). Water which has passed through oil and silt traps will be discharged using the existing Saltom Bay outfall. Control measures including standard construction site environmental management (Sections 5.7 and 5.10 of the Draft Environmental Management Plan - Appendix E to Chapter 5 Project Description, Environmental Statement, West Cumbria Mining, 2018) will be implemented.
- 6.99 Through reliance on the measures above, the marine assessment has concluded that the proposed discharge of surface water into the marine environment Saltom Bay is not likely to have a significant effect on pH, salinity, water temperature of dissolved oxygen (Chapter 17 Marine Environment, Environmental Statement, West Cumbria Mining, 2018, paragraphs 17.29.12 [pH], 17.29.14-17 [salinity], 17.29.13 [water temperature], 17.29.18 [dissolved oxygen]).

Discharges via Pow Beck (from the conveyor and RLF)

- 6.100 Water pollution controls at the conveyor site and RLF will avoid/minimise sediment and pollutant release to Pow Beck and hence the marine environment. Details of the discharge and control measures at the conveyor and RLF sites are described in Chapter 12 Hydrology & Hydrogeology, Appendix 12-7, Flood Risk Assessment and Drainage Strategy, Sections 6.2 and 6.3, Environmental Statement, West Cumbria Mining, 2018.
- 6.101 Dilution effects within Bellhouse Gill and Pow Beck will also reduce the environmental concentrations of any contaminants present (though this is considered unlikely once the good practice measures described above are in place) to the point where they are not predicted to have any significant impact on the marine environment (Chapter 17 Marine Environment, paragraph 17.29.21 – 17.29.23, Environmental Statement, West Cumbria Mining, 2018).
- 6.102 In light of the recent HRA judgment released from the European Court (POW-Sweetman vs Coillte, 12 April 2018), the proposed mitigation measures described above cannot be considered when screening the project for 'likely significant effects' (Regulation 63(1) of the Conservation of Habitats and Species Regulations 2017). In the absence of mitigation measures it is therefore concluded that construction-related effects on water quality are likely to have a significant effect on the Solway Firth pSPA. Whilst no impacts are likely on the River Ehen SAC (which is c.3 km to the east at its closest point but the point at which it discharges to the sea is more than 11 km to the south of the site) or on River Derwent and Bassenthwaite Lake SAC (10.03 km north-east of the main mine site), a precautionary approach has been adopted for these sites because the qualifying interest of both sites includes anadromous fish. In the absence of mitigation it is possible that changes in water quality could impact on these species.
- 6.103 As already explained above, the land at the development site does not include any part of a European site and there is no evidence that it is functionally linked to any European site. This applies also to the foreshore area and marine habitat in the vicinity of the site. Hence marine discharges during construction will not have any impact on any European site through any "functional link" pathway.

Operation Phase

- 6.104 With regard to the following European sites, there is no likely significant effect from deterioration of marine water quality from marine discharges during the operation phase either because an impact mechanism is not present or because the separation distance means that effects are highly unlikely (Chapter 17 Marine Environment, Environmental Statement, section 17.9.1, West Cumbria Mining, 2018):

- Lake District High Fells SAC - the qualifying features are all terrestrial habitats that will not be affected by changes to marine water quality;
- Drigg Coast SAC – the qualifying features are all marine, intertidal or upper shore habitats that are unlikely to be affected by changes in water quality as the development site is 14.45 km south-east of the main mine site; and
- Morecambe Bay and Duddon Estuary Special Protection Area (SPA) – the SPA is 17.07 km south-east of the main mine site and consequently the separation distance means that a significant effect is very unlikely.

6.105 However, during the operation phase of the development, it is possible that discharges arising from the development site could have an adverse effect on marine water quality, for example as a result of pollution (such as silt, oil or concrete) or through changes in the pH, salinity, temperature or dissolved oxygen of the receiving sea water. In the absence of mitigation measures it is therefore possible that the following European sites could be affected and therefore it is acknowledged that this project, alone, is likely to have a significant effect on the following European sites:

- Solway Firth Proposed Special Protection Area (pSPA) – the birds associated with the pSPA are dependent upon the marine environment and could be affected by marine discharges;
- River Ehen Special Area of Conservation (SAC) – whilst the qualifying features are mostly associated with freshwater habitats, salmon is anadromous and therefore is dependent on the marine environment (and freshwater pearl mussel is dependent on salmon as a host for its larval stage) and could be affected by marine discharges;
- River Derwent and Bassenthwaite Lake SAC – whilst the qualifying features are mostly associated with freshwater habitats, salmon, river lamprey and sea lamprey are anadromous and therefore are dependent on the marine environment and could be affected by marine discharges.

6.106 This is the case, despite the following avoidance and reduction measures, due to the decision in People over Wind which prevents reliance on such measures when applying the likely significant effect test:

Discharges via Saltom Bay (from the Main Mine Site)

6.107 During the operation phase of the development surface water within the site will be collected and stored. The mining activities are water consumptive and so it is expected that most surface water will be utilised on site (Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, Flood Risk Assessment and Drainage Strategy, Section 6.1.4.3, Environmental Statement, West Cumbria Mining, 2018).

6.108 Proposed measures include the following during the operational phase:

- All surface water arising from areas of hard-standing and roofs of buildings will be captured, attenuated on site and used in the coal processing plant and as a source of grey water (for example for toilet flushing etc) (Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, Flood Risk Assessment and Drainage Strategy, Section 6.1.4.3, Environmental Statement, West Cumbria Mining, 2018; Sections 5.7 and 5.10 of the Draft Environmental Management Plan - Appendix E to Chapter 5 Project Description, Environmental Statement, West Cumbria Mining, 2018).
- Storm water flows will go to sea via the existing discharge point, and they will first be passed through silt traps and oil interceptors (although it should be noted that during the operational phase silt mobilisation will be limited once the bund vegetation is established, and no oils will be stored outside).
- Storm water flows will be accommodated in the storm water attenuation tank on site (total capacity 6,500m³ - Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, Flood Risk Assessment and Drainage Strategy, Section 6.1.4.3, Environmental Statement, West Cumbria Mining, 2018). Where possible, these flows will be used in the coal processing and associated plant, however in exceptional circumstances a storm water discharge may be required.

- 6.109 All other pollutants will be controlled through the adoption of best practice measures (Draft Environmental Management Plan - Appendix E to Chapter 5 Project Description, Sections 5.7 and 5.10, Environmental Statement, West Cumbria Mining, 2018).
- 6.110 Deterioration of marine water quality is not likely due to the provision of the above appropriate water treatment, which will necessarily have to achieve the environmental permit standard that will be set by the consenting authority (Chapter 5, Environmental Statement, Appendix E, Section 6, West Cumbria Mining, 2018; Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, Flood Risk Assessment and Drainage Strategy, Environmental Statement, West Cumbria Mining, 2018 sets out details of the water treatment facilities during operation [section 6.1.4.3]). The marine assessment has concluded that the proposed discharge of surface water into the marine environment is not likely to have a significant effect on pH, salinity, water temperature of dissolved oxygen (Chapter 17 Marine Environment, Environmental Statement, West Cumbria Mining, 2018, paragraphs 17.31.7 [pH], 17.31.9-12 [salinity], 17.31.8 [water temperature], 17.31.13-14 [dissolved oxygen]).

Discharges via Pow Beck (from the conveyor and the RLF)

- 6.111 As above, during the operation phase of the development surface water within the site will be collected and stored. The mining activities are water consumptive and so it is expected that most surface water will be utilised on site (Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, Flood Risk Assessment and Drainage Strategy, Section 6.1.4.3, Environmental Statement, West Cumbria Mining, 2018).
- 6.112 Water pollution controls at the conveyor site and RLF (including the use of attenuation lagoons) will avoid/minimise sediment and pollutant release to Pow Beck and hence the marine environment. Details of the discharge and control measures at the conveyor and RLF sites are described in Chapter 12 Hydrology & Hydrogeology, Appendix 12-7, Flood Risk Assessment and Drainage Strategy, Sections 6.2 and 6.3, Environmental Statement, West Cumbria Mining, 2018.
- 6.113 Surface discharges to Pow Beck will be at a reduced rate compared to the current greenfield runoff rates. Whilst runoff volume will increase due to the increase in impermeable area, this excess volume will be discharged slowly after the peak flow has passed and will not increase flood flow rates in the Pow Beck.
- 6.114 Dilution effects within Bellhouse Gill and Pow Beck will also reduce the environmental concentrations of any contaminants present (though this is considered unlikely once the good practice measures described above are in place) to the point where they are not predicted to have any significant impact on the marine environment (Chapter 17 Marine Environment, paragraph 17.29.21 – 17.29.23, Environmental Statement, West Cumbria Mining, 2018).
- 6.115 In light of the recent HRA judgment released from the European Court (POW-Sweetman vs Coillte, 12 April 2018), the proposed mitigation measures described above cannot be considered when screening the project for 'likely significant effects' (Regulation 63(1) of the Conservation of Habitats and Species Regulations 2017). In the absence of mitigation measures it is therefore concluded that operation-related effects on water quality are likely to have a significant effect on the Solway Firth pSPA. Whilst no impacts are likely on the River Ehen SAC (which is c.3 km to the east at its closest point but the point at which it discharges to the sea is more than 11 km to the south of the site) or on River Derwent and Bassenthwaite Lake SAC (10.03 km north-east of the main mine site), a precautionary approach has been adopted for these sites because the qualifying interest of both sites includes anadromous fish. In the absence of mitigation it is possible that changes in water quality could impact on these species.
- 6.116 Deterioration of marine water quality in the vicinity of the marine outfall at Saltom Bay or within the vicinity of the mouth of Pow Beck is not likely to impact on Morecambe Bay and Duddon Estuary SPA (which is 17.07 km from the site) and the Drigg Coast SAC (which is 14.45 km from the site). No impact mechanisms have been identified for any of these sites.

- 6.117 As already explained above, the land at the development site does not include any part of a European site and there is no evidence that it is functionally linked to any European site. It is concluded that the development will not affect the conservation objectives for any European site by impacting on any habitats or species that are not qualifying features of those sites (as highlighted by the *Holohan & Ors. v An Bord Pleanála* case).

Decommissioning Phase

- 6.118 With regard to the following European sites, there is no likely significant effect from deterioration of marine water quality from marine discharges during the decommissioning phase either because an impact mechanism is not present or because the separation distance means that effects are highly unlikely (Chapter 17 Marine Environment, Environmental Statement, section 17.9.1, West Cumbria Mining, 2018):

- Lake District High Fells SAC - the qualifying features are all terrestrial habitats that will not be affected by changes to marine water quality;
- Drigg Coast SAC – the qualifying features are all marine, intertidal or upper shore habitats that are unlikely to be affected by changes in water quality as the development site is 14.45 km south-east of the main mine site; and
- Morecambe Bay and Duddon Estuary Special Protection Area (SPA) – the SPA is 17.07 km south-east of the main mine site and consequently the separation distance means that a significant effect is very unlikely.

- 6.119 However, during the decommissioning phase of the development, it is possible that discharges arising from the development site could have an adverse effect on marine water quality, for example as a result of pollution (such as silt, oil or concrete) or through changes in the pH, salinity, temperature or dissolved oxygen of the receiving sea water. In the absence of mitigation measures it is therefore possible that the following European sites could be affected and therefore it is acknowledged that this project, alone, is likely to have a significant effect on the following European sites:

- Solway Firth Proposed Special Protection Area (pSPA) – the birds associated with the pSPA are dependent upon the marine environment and could be affected by marine discharges;
- River Ehen Special Area of Conservation (SAC) – whilst the qualifying features are mostly associated with freshwater habitats, salmon is anadromous and therefore is dependent on the marine environment (and freshwater pearl mussel is dependent on salmon as a host for its larval stage) and could be affected by marine discharges;
- River Derwent and Bassenthwaite Lake SAC – whilst the qualifying features are mostly associated with freshwater habitats, salmon, river lamprey and sea lamprey are anadromous and therefore are dependent on the marine environment and could be affected by marine discharges.

- 6.120 This is the case, despite the following avoidance and reduction measures, due to the decision in *People over Wind* which prevents reliance on such measures when applying the likely significant effect test:

Discharges via Saltom Bay (from the Main Mine Site)

- 6.121 During the decommissioning phase surface water will continue to be collected and attenuated on site. Excess surface water, once it has been passed to the underground storage tank via silt traps and oil interceptors, will be discharged into the marine water column using the existing drainage infrastructure. The discharge via Saltom Bay will be at a maximum flow rate of 25 l/s.
- 6.122 During the decommissioning phase, an environmental management plan and good practice measures will be implemented as per the construction phase to ensure that no contaminated water is discharged to sea. Any discharges via the Saltom Bay outfall would be subject to a discharge permit, and any and all conditions of the discharge permit would have to be adhered to. Impacts of this discharge would be the same as for the construction phase.

- 6.123 Measures will be put in place that are designed to protect the marine environment from the effects of pollution, and by default these measures will protect European sites (Draft Environmental Management Plan - Chapter 5 Project Description, Appendix E, Sections 5.7 and 5.10, Environmental Statement, West Cumbria Mining, 2018).
- 6.124 The discharge of water to sea during the decommissioning phase could have impacts on marine water quality and local marine biota. The input of freshwater into the marine environment could also impact marine biota via changes in pH, temperature, salinity and dissolved oxygen; however, these impacts are likely to be the same as those predicted during the construction phase (Chapter 17 Marine Environment, Environmental Statement, West Cumbria Mining, 2018, paragraph 17.33.6). The marine assessment for the construction phase of the development is therefore considered to apply to the decommissioning phase as well; the assessment for the construction phase concluded that the proposed discharge of surface water into the marine environment is not likely to have a significant effect on pH, salinity, water temperature or dissolved oxygen (Chapter 17 Marine Environment, Environmental Statement, West Cumbria Mining, 2018, paragraphs 17.29.12 [pH], 17.29.14-17 [salinity], 17.29.13 [water temperature], 17.29.18 [dissolved oxygen]).

Discharges via Pow Beck (from the conveyor and RLF)

- 6.125 During the decommissioning phase surface water will continue to be collected and attenuated on site. Water pollution controls at the conveyor site and RLF will avoid/minimise sediment and pollutant release to Pow Beck and hence the marine environment. Details of the discharge and control measures at the conveyor and RLF sites are described in Chapter 12 Hydrology & Hydrogeology, Appendix 12-7, Flood Risk Assessment and Drainage Strategy, Sections 6.2 and 6.3, Environmental Statement, West Cumbria Mining, 2018.
- 6.126 Dilution effects within Bellhouse Gill and Pow Beck will also reduce the environmental concentrations of any contaminants present (though this is considered unlikely once the good practice measures described above are in place) to the point where they are not predicted to have any significant impact on the marine environment. Predicted effects during the decommissioning phase will be the same as or less than the predicted effects during the construction phase (Chapter 17 Marine Environment, paragraph 17.32.7 – 17.32.8, Environmental Statement, West Cumbria Mining, 2018).
- 6.127 In light of the recent HRA judgment released from the European Court (POW-Sweetman vs Coillte, 12 April 2018), the proposed mitigation measures described above cannot be considered when screening the project for 'likely significant effects' (Regulation 63(1) of the Conservation of Habitats and Species Regulations 2017). In the absence of mitigation measures it is therefore concluded that decommissioning-related effects on water quality are likely to have a significant effect on the Solway Firth pSPA. Whilst no impacts are likely on the River Ehen SAC (which is c.3 km to the east at its closest point but the point at which it discharges to the sea is more than 11 km to the south of the site) or on River Derwent and Bassenthwaite Lake SAC (10.03 km north-east of the main mine site), a precautionary approach has been adopted for these sites because the qualifying interest of both sites includes anadromous fish. In the absence of mitigation it is possible that changes in water quality could impact on these species.
- 6.128 As already explained above, the land at the development site does not include any part of a European site and there is no evidence that it is functionally linked to any European site. It is concluded that the development will not affect the conservation objectives for any European site by impacting on any habitats or species that are not qualifying features of those sites (as highlighted by the *Holohan & Ors. v An Bord Pleanála* case).

Deterioration of air quality

- 6.129 In this section consideration is given to the polluting effects on European sites of dust, NO_x and N deposition only. Acid deposition has not been considered as the air quality impact assessment has not identified any significant effects from acid deposition arising as a result of the proposed development (Chapter 15 Air Quality, paragraph 15.6.73, Environmental Statement, West Cumbria Mining, 2018).

Construction Phase

- 6.130 It is important to note that the analysis of air quality impacts presented in the following sections represents, as is legally required, a cumulative assessment of the proposed development (i.e. in combination with other plans and projects). This is explained in the air quality assessment (Chapter 15 Air Quality, paragraph 15.7, Environmental Statement, West Cumbria Mining, 2018).

Dust

- 6.131 There is predicted to be no likely significant effect from dust from the construction phase of the project on any European site either from the project alone or in combination with other plans or projects. This conclusion is not reliant on the delivery of any reduction or avoidance measures and so is compliant with People Over Wind.
- 6.132 The results of the air quality assessment indicate that dust related impacts during the construction phase are unlikely to extend as far as the nearest part of any SAC, SPA or pSPA (Chapter 15 Air Quality, paragraph 15.1.11, Environmental Statement, West Cumbria Mining, 2018). IAQM guidance on the assessment of particulate emissions from operational mineral facilities states that assessment should consider the impact of particulate emissions on receptors located within 400 metres of the operational site boundary (Chapter 15 Air Quality, paragraph 15.3.1, Environmental Statement, West Cumbria Mining, 2018).
- 6.133 The prevailing wind direction is from the south and west (Chapter 15 Air Quality, paragraph 15.6.49, Environmental Statement, West Cumbria Mining, 2018) which means that pollutants are most likely to be transported to the north and east. It therefore follows that, even in the absence of any mitigation (reduction or avoidance) measures, pollutants are likely to be transported away from the Solway Firth pSPA (which is 1.16 km to the north-west), Drigg Coast SAC (which is 14.45 km to the south-east) and Morecambe Bay and Duddon Estuary SPA (which is 17.07 km to the south-east). Pollutants are unlikely to be dispersed as far as the River Ehen SAC (which is 3.00 km to the east), the River Derwent and Bassenthwaite Lake SAC (which is 10.03 km north-east) and the Lake District High Fells SAC (which is 10.18 km east); all these sites are considerably further than the 400 m Zone of Influence identified in IAQM guidance. Given that this is the case, even in the absence of any reduction or avoidance measures, it can be concluded, consistently with People Over Wind, that the project will not give rise to a likely significant effect on any European site, whether considered alone or in combination with other plans and projects.
- 6.134 Furthermore (although not relevant to the likely significant effect test) dust emissions within the site will be reduced by adoption of control measures (Draft Environmental Management Plan - Appendix E to Chapter 5 Project Description, Environmental Statement, West Cumbria Mining, 2018). In addition, in relation to the pSPA and the other marine SACs listed in paragraph 4.1, dust deposition within marine areas will be subject to considerable dilution and rapid dispersal by the prevailing currents (Chapter 17 Marine Environment, Environmental Statement, section 17.29.4 et seq & Table 17.4, West Cumbria Mining, 2018). The effect of dust, either in terms of particulate matter or on water chemistry, is likely to be insignificant.

NOx

- 6.135 There is predicted to be no likely significant effect from NOx from the construction phase of the project on any European site either from the project alone or in combination with other plans or projects. This conclusion is not reliant on the delivery of any reduction or avoidance measures and so is compliant with People Over Wind.
- 6.136 Elevated NOx is not predicted at St Bees Head SSSI, which is c.285m to the north-west of the proposed development site, during the project construction. Although elevated NOx is predicted at Clint's Quarry SSSI (Chapter 15 Air Quality, paragraph 15.4.19, Environmental Statement, West Cumbria Mining, 2018), which is c.2.5 km to the south-east of the nearest part of the proposed development site, this is due to its proximity to the A595, i.e. the source of the NOx is construction-related traffic using this road. Whilst NOx concentrations within those parts of Clint's Quarry SSSI nearest the A595 will exceed the annual mean critical level, the process contribution that is attributable to the development (construction phase traffic) is small (2% or less of the relevant air quality standard). Elsewhere in Clint's Quarry SSSI there will be no predicted exceedance of the annual mean critical level for NOx, i.e. NOx levels drop off rapidly with distance from the A595.

Furthermore the impact will be temporary and is only expected to occur during the peak construction works.

- 6.137 Elevated NO_x is not predicted at the River Ehen SAC, which is c.400m to the north-east of Clint's Quarry. This is because the source of the NO_x is construction traffic associated with the A595, which does not go past the SAC: the nearest part of the SAC is 740m from the A595. Natural England guidance (Natural England, 2018) indicates that protected sites falling within 200 metres of the edge of a road affected by a plan or project need to be considered further: the SAC is located more than 200m away from the A595. This conclusion is not reliant on any avoidance or reduction measures and hence it is compliant with People Over Wind.
- 6.138 As no significant effects are predicted at St Bees Head SSSI or Clint's Quarry SSSI, there is no likely significant effect through this pathway from the project alone or in combination with other plans or projects on any European site, the nearest one being the Solway Firth pSPA, which is 1.16 km to the north-west (this conclusion therefore also applies to the more distant River Ehen SAC, Lake District High Fells SAC, Morecambe Bay and Duddon Estuary SPA, River Derwent and Bassenthwaite Lake SAC, and Drigg Coast SAC). Furthermore, with regard to the Solway Firth pSPA, this is a marine site and therefore it is concluded that effects from airborne pollutants are unlikely, due to dilution and mixing as well as marine derived nutrient loadings (Chapter 15 Air Quality, paragraph 15.3.9, Environmental Statement, West Cumbria Mining, 2018).

N deposition

- 6.139 There is predicted to be no likely significant effect from N deposition from the construction phase of the project on any European site either from the project alone or in combination with other plans or projects. This conclusion is not reliant on the delivery of any reduction or avoidance measures and so is compliant with People Over Wind.
- 6.140 Elevated N deposition levels that exceed the air quality standard are predicted during construction at St Bees Head SSSI and Clint's Quarry SSSI (Chapter 15 Air Quality, paragraph 15.4.19, Environmental Statement, West Cumbria Mining, 2018); however, it is noted that exceedance is predicted in the absence of the development and the process contribution attributable to the development is very small (<1% of the relevant air quality standard) (Chapter 15 Air Quality, Environmental Statement, section 15.6.59, West Cumbria Mining, 2018).
- 6.141 Elevated N deposition is not predicted at the River Ehen SAC, which is c.400m to the north-east of Clint's Quarry. This is because the source of the N deposition is construction traffic associated with the A595, which does not go past the SAC: the nearest part of the SAC is 740m from the A595. Natural England guidance (Natural England, 2018) indicates that protected sites falling within 200 metres of the edge of a road affected by a plan or project need to be considered further: the SAC is located more than 200m away from the A595. This conclusion is not reliant on any avoidance or reduction measures and hence it is compliant with People Over Wind.
- 6.142 In line with EA screening criteria, such an impact is not considered significant. It therefore follows that there is not likely to be a significant effect through this pathway from the project alone or in combination with other plans or projects on the nearest European site, i.e. Solway Firth pSPA, or any of the more distant European sites, i.e. River Ehen SAC, Lake District High Fells SAC, Morecambe Bay and Duddon Estuary SPA, River Derwent and Bassenthwaite Lake SAC and Drigg Coast SAC.
- 6.143 As already explained above, the land at the development site does not include any parts of a European site and there is no evidence that it is functionally linked to any European site. Hence any air quality impacts on the development site itself during construction will not have a negative impact on any European site through any "functional link" pathway.

Operation Phase

Dust

- 6.144 There is predicted to be no likely significant effect from dust from the operation phase of the project on any European site either from the project alone or in combination with other plans or projects. This conclusion is not reliant on the delivery of any reduction or avoidance measures and so is compliant with People Over Wind.
- 6.145 Dust arising from the operational phase of the proposed development has the potential to impact on sensitive receptors. Impacts on local air quality will be minimised through the design of the development, which includes most of the potential dust generating processes being undertaken within an enclosed environment which is subject to negative pressure (Chapter 15 Air Quality, section 15.5, Environmental Statement, West Cumbria Mining, 2018). The air from within these enclosed environments will be filtered prior to emission.
- 6.146 Following People Over Wind and the publication of PINS NOTE 05/2018 by the Planning Inspectorate, competent authorities cannot take account of any avoidance or reduction measures when considering at the HRA screening stage whether the plan or project is likely to have an adverse effect on a European Site. Whilst the proposed development includes designed-in mitigation and the air quality impacts reported in Chapter 15 take this into account, the IAQM guidance (IAQM, 2016) on the assessment of particulate emissions from operational mineral facilities states that assessment should consider the impact of particulate emissions on receptors located within 400 metres⁸ of the operational site boundary (see paragraph 15.3.1 in Chapter 15 Air Quality Environmental Statement, West Cumbria Mining, 2018).
- 6.147 It therefore follows that, even in the absence of any reduction or avoidance measures, dust from the project during operation either alone or in combination with other plans or projects, dust is not likely to have a significant effect on the Solway Firth pSPA (which is 1.16 km to the north-west), Drigg Coast SAC (which is 14.45 km to the south-east), Morecambe Bay and Duddon Estuary SPA (which is 17.07 km to the south-east), River Ehen SAC (which is 3.00 km to the east), Lake District High Fells SAC (which is 10.18 km to the east) and the River Derwent and Bassenthwaite Lake SAC (which is 10.03 km north-east). Dust related impacts are unlikely in the absence of designed-in mitigation.

NOx

- 6.148 There is predicted to be no likely significant effect from NOx from the operation phase of the project on any European site either from the project alone or in combination with other plans or projects. This conclusion is not reliant on the delivery of any reduction or avoidance measures and so is compliant with People Over Wind.
- 6.149 Elevated NOx is not predicted at St Bees Head SSSI, which is c.285m to the north-west of the proposed development site, during the operation of the project. Although elevated NOx is predicted at Clint's Quarry SSSI (Chapter 15 Air Quality, section 15.6.71, Environmental Statement, West Cumbria Mining, 2018), which is c.2.5 km to the south-east of the nearest part of the proposed development site, this is due to its proximity to the A595, i.e. the source of the NOx is traffic using this road, some of which will be associated with the operation of the site. Whilst NOx concentrations within those parts of Clint's Quarry SSSI nearest the A595 will exceed the annual mean critical level, the process contribution that is attributable to the development is small (2% or less of the relevant air quality standard). Elsewhere in the quarry there will be no predicted exceedance of the annual mean critical level for NOx, i.e. NOx levels drop off rapidly with distance from the A595.

⁸ IAQM (2016) states that '*The experience of the Working Group together with published studies and anecdotal evidence on the change in both airborne concentrations and the rate of deposition with distance, suggests that dust impacts will occur mainly within 400 m of the operation, even at the dustiest of sites*'.

- 6.150 Elevated NO_x is not predicted at the River Ehen SAC, which is c.400m to the north-east of Clint's Quarry. This is because the source of the NO_x is traffic associated with the A595, which does not go past the SAC: the nearest part of the SAC is 740m from the A595. Natural England guidance (Natural England, 2018) indicates that protected sites falling within 200 metres of the edge of a road affected by a plan or project need to be considered further: the SAC is located more than 200m away from the A595. This conclusion is not reliant on any avoidance or reduction measures and hence it is compliant with People Over Wind.
- 6.151 As no significant effects are predicted at St Bees Head SSSI or Clint's Quarry SSSI, there is no likely significant effect through this pathway from the project alone or in combination with other plans or projects on any European site, the nearest one being the Solway Firth SPA, which is 1.16 km to the north-west (this conclusion therefore also applies to the more distant River Ehen SAC, Lake District High Fells SAC, Morecambe Bay and Duddon Estuary SPA, River Derwent and Bassenthwaite Lake SAC, and Drigg Coast SAC). Furthermore, with regard to the Solway Firth pSPA, this is a marine site and therefore it is concluded that effects from airborne pollutants are unlikely, due to dilution and mixing as well as marine derived nutrient loadings (Chapter 15 Air Quality, section 15.3.9, Environmental Statement, West Cumbria Mining, 2018).

N deposition

- 6.152 There is predicted to be no likely significant effect from N deposition from the operation phase of the project on any European site either from the project alone or in combination with other plans or projects. This conclusion is not reliant on the delivery of any reduction or avoidance measures and so is compliant with People Over Wind.
- 6.153 Elevated N deposition levels that exceed the air quality standard are predicted during the operation phase at St Bees Head SSSI and Clint's Quarry SSSI (Chapter 15 Air Quality, section 15.6.73, Environmental Statement, West Cumbria Mining, 2018); however, it is noted that exceedance is predicted in the absence of the development and the process contribution attributable to the development is very small (<1% of the relevant air quality standard) (Chapter 15 Air Quality, Environmental Statement, section 15.6.73, West Cumbria Mining, 2018).
- 6.154 Elevated N deposition is not predicted at the River Ehen SAC, which is c.400m to the north-east of Clints Quarry. This is because the source of the N deposition is traffic associated with the A595, which does not go past the SAC: the nearest part of the SAC is 740m from the A595. Some of this traffic will be associated with the operation of the site. Natural England guidance (Natural England, 2018) indicates that protected sites falling within 200 metres of the edge of a road affected by a plan or project need to be considered further: the SAC is located more than 200m away from the A595. This conclusion is not reliant on any avoidance or reduction measures and hence it is compliant with People Over Wind.
- 6.155 In line with EA screening criteria, such an impact is not considered significant. It therefore follows that there is not likely to be a significant effect through this pathway from the project alone or in combination with other plans or projects on the nearest European site, i.e. Solway Firth pSPA, or any of the more distant European sites, i.e. River Ehen SAC, Lake District High Fells SAC, Morecambe Bay and Duddon Estuary SPA, River Derwent and Bassenthwaite Lake SAC and Drigg Coast SAC.
- 6.156 As already explained above, the land at the development site does not include any parts of a European site and there is no evidence that it is functionally linked to any European site. Hence any air quality impacts on the development site itself during construction will not have a negative impact on any European site through any "functional link" pathway.

Decommissioning Phase

Dust

- 6.157 There is predicted to be no likely significant effect from dust from the decommissioning phase of the project on any European site either from the project alone or in combination with other plans or projects. This conclusion is not reliant on the delivery of any reduction or avoidance measures and so is compliant with People Over Wind.

- 6.158 The air quality assessment has concluded that air quality impacts during the decommissioning phase will be similar to those predicted for the construction phase (Chapter 15 Air Quality, Environmental Statement, section 15.8.3, West Cumbria Mining, 2018). The air quality assessment has determined that dust related impacts during the construction phase are unlikely to extend as far as the nearest part of any SAC, SPA or pSPA (Chapter 15 Air Quality, section 15.1.11, Environmental Statement, West Cumbria Mining, 2018). IAQM guidance on the assessment of particulate emissions from operational mineral facilities states that assessment should consider the impact of particulate emissions on receptors located within 400 metres of the operational site boundary (Chapter 15 Air Quality, section 15.3.1, Environmental Statement, West Cumbria Mining, 2018).
- 6.159 The prevailing wind direction is from the south and west (Chapter 15 Air Quality, paragraph 15.6.49, Environmental Statement, West Cumbria Mining, 2018) which means that pollutants are most likely to be transported to the north and east. It therefore follows that, even in the absence of any mitigation (reduction or avoidance) measures, pollutants are likely to be transported away from the Solway Firth pSPA (which is 1.16 km to the north-west), Drigg Coast SAC (which is 14.45 km to the south-east) and Morecambe Bay and Duddon Estuary SPA (which is 17.07 km to the south-east). Pollutants are unlikely to be dispersed as far as the River Ehen SAC (which is 3.00 km to the east), Lake District High Fells SAC (which is 10.18 km to the east) and the River Derwent and Bassenthwaite Lake SAC (which is 10.03 km north-east); all these sites are considerably further than the 400 m Zone of Influence identified in IAQM guidance. Given that this is the case, even in the absence of any reduction or avoidance measures, it can be concluded, consistently with People Over Wind, that the project will not give rise to a likely significant effect on any European site, whether considered alone or in combination with other plans and projects.
- 6.160 Furthermore (although not relevant to the likely significant effect test) dust emissions within the site will be reduced by adoption of control measures (Draft Environmental Management Plan - Appendix E to Chapter 5 Project Description, Environmental Statement, West Cumbria Mining, 2018). In addition, in relation to the pSPA and the other marine SACs listed in paragraph 4.1, dust deposition within marine areas will be subject to considerable dilution and rapid dispersal by the prevailing currents (Chapter 17 Marine Environment, Environmental Statement, section 17.29.4 et seq & Table 17.4, West Cumbria Mining, 2018). The effect of dust, either in terms of particulate matter or on water chemistry, is likely to be insignificant.

NO_x

- 6.161 There is predicted to be no likely significant effect from NO_x from the decommissioning phase of the project on any European site either from the project alone or in combination with other plans or projects. This conclusion is not reliant on the delivery of any reduction or avoidance measures and so is compliant with People Over Wind.
- 6.162 As no significant elevated NO_x levels are predicted at St Bees Head SSSI and Clint's Quarry SSSI (which are respectively 285 m to the north-west and 2.5 km to the south-east of the proposed development site) during the decommissioning phase, there is no likely significant effect through this pathway from the project alone or in combination with other plans or projects on any European site, the nearest one being the Solway Firth pSPA, which is 1.16 km to the north-west (this conclusion therefore also applies to the more distant River Ehen SAC, Lake District High Fells SAC, Morecambe Bay and Duddon Estuary SPA, River Derwent and Bassenthwaite Lake SAC, and Drigg Coast SAC). Furthermore, the Solway Firth pSPA is a marine site and therefore it is concluded that effects from airborne pollutants are unlikely, due to dilution and mixing as well as marine derived nutrient loadings (Chapter 15 Air Quality, section 15.3.9, Environmental Statement, West Cumbria Mining, 2018).

N deposition

- 6.163 There is predicted to be no likely significant effect from N deposition from the decommissioning phase of the project on any European site either from the project alone or in combination with other plans or projects. This conclusion is not reliant on the delivery of any reduction or avoidance measures and so is compliant with People Over Wind.

- 6.164 No significant elevated N deposition levels are predicted at St Bees Head SSSI and Clint's Quarry SSSI during the decommissioning phase, and therefore it is highly unlikely that there will be an effect on any European site (which are all further away). It therefore follows that there is not likely to be a significant effect on the nearest European site, i.e. Solway Firth pSPA, or any of the more distant European sites, i.e. River Ehen SAC, Lake District High Fells SAC, Morecambe Bay and Duddon Estuary SPA, River Derwent and Bassenthwaite Lake SAC and Drigg Coast SAC.
- 6.165 As already explained above, the land at the development site does not include any part of a European site and there is no evidence that it is functionally linked to any European site. It is concluded that the development will not affect the conservation objectives for any European site by impacting on any habitats or species that are not qualifying features of those sites (as highlighted by the *Holohan & Ors. v An Bord Pleanála* case).

Subsidence effects on terrestrial and marine environment

Construction Phase

- 6.166 No likely significant effect through subsidence on any European site is predicted in the construction phase from the project, either alone or in combination with other plans or project. This is because no subsidence will take place during the construction phase of the project because this stage will involve construction-related activities within the terrestrial areas only, i.e. construction of the main mine site, conveyor, rail loading facility. No mining activity will take place during this stage of the development.
- 6.167 As no likely significant effect through subsidence is predicted, it follows that no likely significant effect through induced seismicity (i.e. seismicity associated with and induced by subsidence) on any European site is predicted in the construction phase from the project, either alone or in combination with other plans or project.

Operation Phase

- 6.168 It is assumed that, in the absence of paste backfill (explained further below), subsidence (and any associated seismic events induced by subsidence), is likely to have a significant effect during the operational phase of this project on the following European sites through changes in marine water and habitat quality that may impact on the qualifying species:
- Solway Firth pSPA – the birds associated with the pSPA are dependent upon the marine environment and could be affected by changes in environmental conditions arising as a result of subsidence;
 - River Ehen SAC – whilst the qualifying features are mostly associated with freshwater habitats, salmon is anadromous and therefore is dependent on the marine environment (and freshwater pearl mussel is dependent on salmon as a host for its larval stage) and could be affected by changes in environmental conditions arising as a result of subsidence;
 - River Derwent and Bassenthwaite Lake SAC – whilst the qualifying features are mostly associated with freshwater habitats, salmon, river lamprey and sea lamprey are anadromous and therefore are dependent on the marine environment and could be affected by changes in environmental conditions arising as a result of subsidence.
- 6.169 This is the case, despite the following avoidance and reduction measures, due to the decision in *People over Wind* which prevents reliance on such measures when applying the likely significant effect test:

Onshore mining

- 6.170 For the areas of onshore mining, as a result of the proposed partial extraction mining technique in combination with the use of paste backfill in mined areas, as a worst case scenario, very low levels of subsidence are possible under the terrestrial habitats, if at all. If subsidence does occur it will happen gradually.

- 6.171 The proposed mining method under the terrestrial and marine environment (note that there is no coal extraction under St Bees Head SSSI and the MCZ) involves the backfilling of voids with waste material: whilst this process mitigates the effects of subsidence, this is only an incidental benefit. The paste backfilling process is primarily designed to provide an efficient and cost-effective way of disposing of waste material; it is not specifically designed as an impact avoidance or reduction measure. This is probably not therefore to be regarded as an avoidance or reduction measure under People Over Wind, however as a precaution and reflecting uncertainty about the People Over Wind judgment, this pathway is still considered at the Appropriate Assessment below.
- 6.172 The paste backfill involves waste rock being converted into a paste type material, which will consist of ground up rock, a cementitious additive and water. This will be pumped into the underground areas that have been mined. The deposited material, once hardened, provides additional stability underground (Briefing Note, Paste Plant Process, Appendix D to Chapter 5 Project Description, Environmental Statement, West Cumbria Mining, 2018).
- 6.173 It is expected that the paste would fill 65% of the void space created by mining in the panels where paste backfill is employed (Appendix B to Chapter 5 Project Description, Environmental Statement, West Cumbria Mining, 2018). It is therefore planned in the event that the amount of waste is limited, to prioritise the paste backfill to areas that will be most sensitive to subsidence, such as the terrestrial areas (Appendix D to Chapter 5 Project Description, Environmental Statement, West Cumbria Mining, 2018).
- 6.174 The maximum predicted subsidence arising from areas of multiple panel mining is 30 cm in the absence of paste backfill, which reduces to less than 15 cm when the same excavation is backfilled by 65 % with paste. The maximum rate at which the subsidence will take place over the centre of a panel is 0.6 cm per day (without paste backfill) and less than 0.3 cm per day (with paste backfill) over a two-week period when the face of the panel is directly underneath (Appendix D to Chapter 5 Project Description, Environmental Statement, West Cumbria Mining, 2018). Subsidence, if it happens, will only occur during the operation phase of the development (if a drift collapses this is not predicted to result in subsidence at the surface: Appendix B, Section 3.3, Subsidence Briefing Note, Chapter 5 Project Description, Environmental Statement, West Cumbria Mining, 2018).
- 6.175 Overall it is concluded that, whilst subsidence (and therefore associated seismic events induced by subsidence) may occur (during the operation phase) below onshore terrestrial habitat. However, such subsidence will be of limited magnitude and will be slow to develop.

St Bees Head SSSI and the MCZ

- 6.176 Potential subsidence impacts on the St Bees Head SSSI and the MCZ have been considered because of the potential for these sites to be functionally linked to the Solway Firth pSPA.
- 6.177 No mining is proposed beneath the St Bees Head SSSI, nor beneath the MCZ. A 'stand-off' of 150m is proposed between the offshore mining boundary and the westernmost extent of the MCZ boundary. The only activities proposed under the MCZ and SSSI are the installation of access tunnels. Due to their depth below surface and the methods of construction and support, there is expected to be no surface subsidence above the access tunnels (Appendix B, Subsidence Briefing Note, Chapter 5 Project Description, Environmental Statement, West Cumbria Mining, 2018).
- 6.178 Therefore the project's operation phase will not give rise to any likely significant effect on any European site through subsidence and associated seismic events beneath the SSSI or the MCZ, when considered alone or in combination with any other plan or project.

Offshore mining

- 6.179 For the areas of offshore mining, as a result of the proposed partial extraction method and the use of paste backfill (as detailed above), approximately 10% of the offshore mining area may experience subsidence up to 15 cm, and approximately 50% may experience subsidence of up to 7.5 cm (Appendix B, Subsidence Briefing Note, Chapter 5 Project Description, Environmental Statement, West Cumbria Mining, 2018). As noted above, subsidence, if it occurs, will be slow to develop.

- 6.180 The marine assessment concludes that there is not likely to be a significant impact on the shore as a result of subsidence or associated seismic events under the marine environment (Chapter 17 Marine Environment, Section 17.30.11, Environmental Statement, West Cumbria Mining 2018). It also concludes that there is not likely to be a significant effect from the project through subsidence or associated seismic events on the Solway Firth pSPA, which is the nearest European site (Chapter 17 Marine Environment, Section 17.30.12 et seq, Environmental Statement, West Cumbria Mining 2018).
- 6.181 Subsidence under the marine environment will not have a direct effect on any other European sites as they are too distant (more than 10 km – whilst the closest part of the R. Ehen SAC is 3 km from the site, the point where the river discharges to the sea is more than 10 km away).
- 6.182 Whilst subsidence has the potential to impact on marine biota, potentially resulting in an indirect effect on anadromous fish species (which are qualifying features of the R. Ehen SAC and R. Derwent and Bassenthwaite Lake SAC), no significant effects are likely due to the small magnitude and slow rate of the predicted change (Chapter 17 Marine Environment, Section 17.30.13, Environmental Statement, West Cumbria Mining 2018).
- 6.183 It can therefore be concluded that, whilst subsidence may occur above some of the mined areas offshore (i.e. beyond the MCZ), due to the slow nature of its development and the overlying 15-20m thick marine sediments, no significant impact is predicted.
- 6.184 As no significant impact through subsidence is predicted, it follows that no significant impact through induced seismicity (i.e. seismicity associated with and induced by subsidence) is predicted.
- 6.185 However, this conclusion is dependent on the proposed method of mining including the paste backfill method. There is a possibility that this could be regarded as an avoidance or reduction measure following People Over Wind. Hence, due to the uncertainties arising from People over Wind, and so as to ensure a robust assessment, it is acknowledged that, in the absence of these measures, this potential impact pathway (subsidence in the offshore area) is likely to have a significant effect on the following European sites:
- Solway Firth pSPA
 - River Ehen SAC
 - River Derwent and Bassenthwaite Lake SAC
- 6.186 The following European sites are all more than 10 km from the development site. This is sufficiently distant that significant effects as a result of mining related subsidence is not likely (Chapter 17 Marine Environment, Environmental Statement, section 17.9.1, West Cumbria Mining, 2018):
- Lake District High Fells SAC
 - Drigg Coast SAC
 - Morecambe Bay and Duddon Estuary SPA

Decommissioning Phase

- 6.187 No likely significant effect on any European site is predicted in the decommissioning phase through subsidence from the project either alone or in combination with other plans or project. This is because subsidence will only occur during the operation phase of the development, with subsidence taking place within a short period of time following the extraction of coal from a panel (Appendix B, Subsidence Briefing Note, Chapter 5 Project Description, Environmental Statement, West Cumbria Mining, 2018).
- 6.188 Once abandoned, the structural condition of the tunnels/drifts under the MCZ will deteriorate over time, owing to the ground pressures which act on the tunnels. A collapse of the tunnels/drifts is then conceivable; however, there would be no surface expression or subsidence (Appendix B, Subsidence Briefing Note, Chapter 5 Project Description, Environmental Statement, West Cumbria Mining, 2018).

- 6.189 As no likely significant effect through subsidence is predicted, it follows that no likely significant effect through induced seismicity (i.e. seismicity associated with and induced by subsidence) is predicted on any European site is predicted in the decommissioning phase from the project, either alone or in combination with other plans or project.

Summary of Likely Significant Effects

- 6.190 In the absence of avoidance and reduction measures (as is required under People Over Wind) it is concluded that the proposed development is alone likely to have a significant effect on:
- Solway Firth pSPA;
 - River Ehen SAC; and
 - River Derwent and Bassenthwaite Lake SAC.
- 6.191 A significant effect is likely to occur at each of the European sites listed at paragraph 6.188 above through a combination of one or more of the following pathways:
- Disturbance of marine or terrestrial qualifying species by way of noise and/or vibration;
 - Direct loss of or damage to marine habitat or disturbance to marine species from scouring and/or sedimentation from any discharges via Saltom Bay;
 - Direct loss of or damage to marine habitat or disturbance to marine species from scouring and/or sedimentation from any discharges via Pow Beck catchment; Deterioration of marine water quality as a result of sediment laden water run-off via Saltom Bay;
 - Deterioration of marine water quality as a result of sediment-laden surface water run-off via Pow Beck catchment;
 - Deterioration of marine water quality as a result of disturbance of contamination and/or mobilisation of pollutants (including changes in pH, temperature, salinity, and dissolved oxygen) discharged via existing Saltom Bay Deterioration of marine water quality as a result of mobilisation of pollutants (including changes in pH, temperature, salinity, and dissolved oxygen) discharged via Pow Beck catchment;
 - Subsidence under the terrestrial environment as a result of sub-surface mining activities; and/or
 - Subsidence under the marine environment as a result of sub-surface mining activities.
- 6.192 This conclusion has been reached by considering the project alone and therefore an 'in combination' assessment has not been necessary as part of the screening process.

7 Stage 2: Appropriate Assessment

- 7.1 The proposed development is considered likely to have significant effects on a number of European sites in the absence of mitigation, (see Summary of Likely Significant Effects in Section 6, paragraph 6.177 et seq). Consequently the requirement to complete an appropriate assessment is triggered, which considers the effects of the proposed development on the integrity of a European site alone and in combination with other plans or projects. Where potential adverse effects are identified, this part of the assessment needs to consider reduction and avoidance measures to mitigate the identified effects.
- 7.2 In Tables 2 to 19 these impacts are evaluated and appropriate mitigation measures considered when determining whether the development may have an adverse effect on the integrity of any European site. In these tables impacts are considered for the construction, operation and decommissioning phases of the development; however, it should be noted that the construction phase includes a remediation phase that precedes and is separate to any construction-related work. This means that any ground contamination will have been remediated prior to construction commencing.
- 7.3 As the project has triggered the requirement to complete an appropriate assessment, each of these impact mechanisms has been considered to determine whether there may be an adverse effect on the integrity of each of the six European sites identified at paragraphs 4.1 and 4.2 (Wast Water SAC and Morecombe Bay SAC have been scoped out – see paragraphs 4.3 and 4.8). The results of the assessment are presented in Tables 2 to 19.
- 7.4 It is acknowledged that, for certain impact pathways in relation to the European sites considered in Section 6 above, it has been concluded that there is no likely significant effect of the project alone or in combination with other plans or projects (air quality modelling includes an in-combination assessment). However, due to the uncertainty created by the People Over Wind decision, it has been decided that the most robust approach is to consider every pathway in relation to each of the six European sites at the appropriate assessment stage too. Hence this is the approach adopted in the Tables below.
- 7.5 The assessment presented in Tables 2 to 19 also consider impacts on all habitats and species associated with a European site (irrespective of whether or not they are qualifying features) if impacts on those habitats and species are liable to affect the conservation objectives of the site, i.e. if those habitats and species are necessary to the conservation of the habitat types and species listed for the protected area (see *Holohan & Ors. v An Bord Pleanála*, 7 November 2018, C - 461/17).
- 7.6 In Tables 2 to 19 each European site is considered with regard to the impact mechanisms and pathways identified by WYG (WYG, 2017), acting on behalf of Cumbria County Council as the competent authority. It is noted that WYG has included the caveat that the list of identified impact pathways is not necessarily exhaustive and that others may exist. When undertaking this assessment BSG Ecology has reviewed the identified impact pathways, but has not identified any additional ones that also need to be considered.
- 7.7 For each European site the impact mechanism and pathway is considered and a summary assessment is provided. The assessment draws upon an evidence base that includes the relevant chapters of the Environmental Statement (West Cumbria Mining, 2018) complemented by a range of annex reports. The following documents have been referenced in the assessment:
- Chapter 5 Project Description (and Appendices B, D, E and G);
 - Chapter 11 Ecology, Environmental Statement, West Cumbria Mining (including Appendix 11.8 Solway Firth Evidence Document: BSG Ecology (2018). Cumbrian Metallurgical Coal Project: Review of adverse effects on terrestrial habitats that may form part of a functional link to the proposed Solway Firth Special Protection Area and Appendix 11.9 St Bees SSSI Assessment);
 - Chapter 12 Hydrology and Hydrogeology, Environmental Statement, West Cumbria Mining 2018 (which includes the Appendix 12.7 Flood Risk Assessment and Drainage Strategy);

- Chapter 13 Ground Conditions and Contamination, Environmental Statement, West Cumbria Mining;
- Chapter 14 Noise and Vibration, Environmental Statement, West Cumbria Mining;
- Chapter 15 Air Quality, Environmental Statement, West Cumbria Mining;
- Chapter 17 The Marine Environment, Environmental Statement, West Cumbria Mining (including Appendix C, MCZ Assessment).

Solway Firth pSPA

- 7.8 The qualifying features of the Solway Firth pSPA are as follows:
- 7.9 The Solway Firth pSPA is a large estuarine/marine site with a total area of 1357.49 km² situated between the western coastal margins of Cumbria in England and Dumfries and Galloway in Scotland, off the west coast of Great Britain. It is one of the largest estuaries in the UK along with Morecambe Bay and the Wash.
- 7.10 The Solway Firth (including the classified Upper Solway Flats and Marshes SPA and the proposed marine extension) supports populations of European importance of the following Annex 1 species: red-throated diver (*Gavia stellata*); whooper swan (*Cygnus cygnus*); barnacle goose (*Branta leucopsis*); golden plover (*Pluvialis apricaria*); bar-tailed godwit (*Limosa lapponica*).
- 7.11 The pSPA also supports migratory populations of European importance of the following species: pink-footed goose (*Anser brachyrhynchus*); shelduck (*Tadorna tadorna*); teal (*Anas crecca*); pintail (*Anas acuta*); shoveler (*Anas clypeata*); scaup (*Aythya marila*); common scoter (*Melanitta nigra*); goldeneye (*Bucephala clangula*); goosander (*Mergus merganser*); oystercatcher (*Haematopus ostralegus*); knot (*Calidris canutus*); ringed plover (*Charadrius hiaticula*); grey plover (*Pluvialis squatarola*); lapwing (*Vanellus vanellus*); dunlin (*Calidris alpina*); sanderling (*Calidris alba*); redshank (*Tringa totanus*); turnstone (*Arenaria interpres*); curlew (*Numenius arquata*); cormorant (*Phalacrocorax carbo*); black-headed gull (*Larus ridibundus*); common gull (*Larus canus*); herring gull (*Larus argentatus*).
- 7.12 The coastal area within the existing SPA includes a range of habitats including mudflats and sandflats, lagoons, salt marshes and inland water bodies. This diversity is extended into the marine environment with the sea bed comprising a wide range of mobile sediments.
- 7.13 The conservation objectives for the Solway Firth proposed SPA (Scottish Natural Heritage & Natural England, 2016b) are:
- To avoid deterioration of the habitats of the qualifying species or significant disturbance to the qualifying species, subject to natural change, thus ensuring that the integrity of the site is maintained in the long-term and it continues to make an appropriate contribution to achieving the aims of the Birds Directive for each of the qualifying species.
- 7.14 This contribution will be achieved through delivering the following objectives for each of the site's qualifying features:
- Avoid significant mortality, injury and disturbance of the qualifying features, so that the distribution of the species and ability to use the site are maintained in the long-term;
 - To maintain the habitats and food resources of the qualifying features in favourable condition.

Construction Phase

Table 2: Impact mechanisms and pathways during the construction phase of the development – Solway Firth pSPA

Solway Firth pSPA – construction phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
1	Direct loss of or damage to terrestrial habitat – MMS, RLF/UC	Potential loss of terrestrial supporting habitat for pSPA birds through land-take	Please see paragraphs 6.8 et seq in Chapter 6, which provide a detailed assessment.	Yes	Yes
2	Disturbance of marine or terrestrial qualifying species (visual/noise/vibration) – MMS/RLF/UC/UM)	<p>Potential effect on pSPA marine birds within the surrounding functional habitat through:</p> <p>Visual disturbance</p> <p>Human presence</p> <p>Noise</p> <p>Vibration</p>	<p><u>Visual disturbance</u></p> <p>Please see paragraphs 6.27 et seq in Chapter 6, which provides a detailed assessment.</p> <p><u>Human presence</u></p> <p>Disturbance resulting from human presence is directly linked to visual disturbance, i.e. human presence may have an impact as a result of visual disturbance. Please see paragraphs 6.27 et seq in Chapter 6, which provides a detailed assessment.</p> <p><u>Noise and vibration</u></p> <p>The assessment of noise and vibration in Chapter 14 of the ES has been carried out taking into account designed-in mitigation measures, which include: all construction plant and equipment should comply with EU noise emission limits; all vehicles and mechanical plant should be fitted with effective exhaust silencers and should be maintained in good efficient working order;</p>	Yes	Yes

Solway Firth pSPA – construction phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>inherently quiet plant will be used where appropriate; all major compressors should be 'sound reduced' models; all ancillary pneumatic percussive tools should be fitted with mufflers or silencers; all ancillary plant such as generators, compressors and pumps should be positioned so as to cause minimum noise disturbance; construction contractors should be obliged to adhere to the codes of practice for construction working given in BS 5228 (Chapter 14 Noise and Vibration, section 14.6.1, Environmental Statement, West Cumbria Mining, 2018).</p> <p>Data collected through desk study complemented by survey data collected during various surveys carried out during the period 2015 to 2018 have led to the conclusion that no parts of the land at the site provide terrestrial supporting habitat for pSPA birds. No impacts on pSPA birds are expected as there is no evidence that the land at the development site is functionally linked with the pSPA (i.e. it is not critical to or necessary for the ecological or behavioural functioning of the qualifying features for which a site has been designated). The closest point of the Solway Firth pSPA is 1.16 km to the north-west of the development land, which is sufficiently distant that noise and vibration related impacts on any qualifying features are not expected.</p> <p>Surveys have also found that the adjacent marine area (which will only be affected by surface water drainage from the development site during the construction phase) is only used by small numbers of a limited range of pSPA species, e.g. common scoter, cormorant, common gull, herring gull (BSG Ecology, 2018). Whilst species for which the pSPA is qualified have been recorded, these were all outside the pSPA boundary and may</p>		

Solway Firth pSPA – construction phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>well not form part of the pSPA population).</p> <p>The noise assessment has used ecological receptors, such as St Bees Head SSSI which is c.285m to the north-west of the proposed development site, that are closer to the development site than any of the European sites. Consequently it is reasonable to assume that the conclusions of the assessment for St Bees Head SSSI can be applied to the nearest European site and its qualifying features (i.e. the pSPA). When avoidance and reduction measures are taken into account, disturbance impacts are not likely to extend as far as the pSPA, which is the nearest European site (1.1 km away). In any event, any noise/vibration impacts during the proposed construction are likely to be short-term as the development progresses.</p> <p>The noise and vibration assessment has concluded that during the construction phase, there are no predicted noise or vibration related changes arising from the proposed development that will impact on the Solway Firth pSPA (Chapter 14 Noise and Vibration, section 14.9.4 et seq, Environmental Statement, West Cumbria Mining, 2018). The noise assessment concludes that construction noise levels at the proposed SPA will be less than 20 dB(A) at the nearest point, which is low compared with prevailing background noise levels; for example, background noise levels in a rural area at night are typically of the order 30 Db(A) (Chapter 14 Noise and Vibration, Table A14.1.1, Environmental Statement, West Cumbria Mining, 2018).</p> <p>This conclusion is reinforced in the marine assessment (Chapter 17 Marine Environment, Environmental Statement, section</p>		

Solway Firth pSPA – construction phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>17.29.1, West Cumbria Mining, 2018). There are no planned construction operations which are expected to give rise to noise and/or vibration that will affect any pSPA qualifying species or supporting species or habitats. It is concluded that the pSPA's population of qualifying species will not be affected by noise and vibration.</p> <p>Overall, it is concluded that there will be no adverse effect on the integrity of the pSPA (through impacts on the populations of the pSPA qualifying species or through impacts on supporting habitats or species) through this pathway alone or in combination with other plans or projects.</p>		
3	Direct loss of or damage to marine habitat or disturbance to marine species from scouring and/or sedimentation from any discharges from the existing discharge pipe into Saltom Bay	Potential effect on pSPA marine birds both within pSPA boundary and surrounding functional habitat through impacts on prey availability	<p>The proposed development will not impact directly on any part of the Solway Firth pSPA. Impacts on marine habitat or disturbance to marine species from scouring and/or sedimentation are, however, possible as a result of discharges of surface water made through the existing sea outfall pipe at Saltom Bay.</p> <p>Data collected through desk study complemented by survey data collected during various surveys carried out during the period 2015 to 2018 have led to the conclusion that no parts of the land at the development site provide supporting habitat for pSPA birds (BSG Ecology, 2018).</p> <p>During the remediation of the development site no surface water discharge is likely, as areas being worked will be covered to prevent rainwater ingress (where necessary), which will prevent surface water drainage from these areas. For other parts of the site there will be a state of no change compared to the pre-</p>	Yes	Yes

Solway Firth pSPA – construction phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>development situation (Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, Flood Risk Assessment and Drainage Strategy, section 6.1.4.1, Environmental Statement, West Cumbria Mining, 2018; Chapter 17 Marine Environment, Environmental Statement, section 17.29.6 et seq, West Cumbria Mining, 2018). Consequently, during the remediation of the site there is no mechanism by which scouring or sedimentation impacts on the marine environment could occur.</p> <p>During the remaining part of the construction phase, reuse of surface water within the site will minimise surface water runoff and subsequent discharge to sea. In periods of heavy rainfall, flows will be attenuated on site through storage (Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, Flood Risk Assessment and Drainage Strategy, section 6.1.4.2 et seq, Environmental Statement, West Cumbria Mining, 2018).</p> <p>However, following heavy rainfall excess surface water runoff will need to be discharged to sea via the existing outfall in Saltom Bay. The discharge pipe runs down the foreshore and terminates in the intertidal zone (it is only fully exposed around low water springs tides).</p> <p>In order to minimise potential scour, the maximum flow rate of the discharge will be limited to 25 l/s, which will only be reached during and following heavy rainfall events. The proposed development will also minimise the potential for scour on the intertidal area around the outfall by limiting, wherever practicable, surface water discharge to when the outlet point is submerged. By only discharging surface water when the outlet</p>		

Solway Firth pSPA – construction phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>point is submerged, the potential for scour at the proposed flow rates will be minimised (Chapter 17 Marine Environment, Environmental Statement, section 17.29.10, West Cumbria Mining, 2018).</p> <p>When the discharge point is exposed (i.e. not submerged), modelling results indicate that the proposed flow rate would be sufficient to mobilise fine sand material (i.e. no significant sediment re-suspension is likely). However, the sediments at the discharge point location consist of coarse sands (and cobbles and boulders), and so any re-suspended particles are likely to settle out very quickly. It is concluded that any effect on water quality and biota will be localised and of minor significance (Chapter 17 Marine Environment, Environmental Statement, section 17.29.9, West Cumbria Mining, 2018).</p> <p>Modelling work has concluded that the Zone of Influence of the discharge into the sea, when combined with the existing leachate discharge, is 162m from the Saltom Bay outfall, which means that the Solway Firth pSPA and its qualifying features will not be directly impacted (Chapter 17 Marine Environment, Environmental Statement, section 17.34.7 et seq, West Cumbria Mining, 2018). Furthermore, as the proposed discharge is not expected to have a significant effect on marine fauna, no indirect impacts on pSPA qualifying features are expected either, e.g. as a result of impacts on prey species. As such, an in-combination effect with other plans or projects is considered very unlikely, however, to ensure a comprehensive assessment, other discharges from other plans and projects have also been considered if they include a proposed discharge to sea which</p>		

Solway Firth pSPA – construction phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>could combine with the 162m zone of influence from the Saltom Bay outfall (Chapter 17 Marine Environment, Environmental Statement, sections 17.34.1 to 17.34.5, West Cumbria Mining, 2018).</p> <p>The zone of influence (ZOI) of the proposed surface water runoff discharge to Saltom Bay has been calculated as approximately 162 m and is over 8 km (by sea) from the mouth of Pow Beck. Hence no in-combination effect is predicted between the two sources of surface water runoff associated with the proposed development.</p> <p>The following licensable discharges to sea are within the vicinity of Saltom Bay and have the potential to interact with the surface water runoff discharges from the Saltom Bay outfall associated with the proposed development (Chapter 17 , paragraph 17.34, of the Environmental Statement):</p> <p>A private sewer discharge outfall is located approximately 350 m from the proposed WCM discharge point and it is permitted to discharge no more than 0.2 m³ per day. The permit associated with this discharge states that the discharge must have no adverse visible effect on the receiving environment. Modelling shows that the private sewer discharge from a pharmacy in Kells (to Saltom Bay) is outside the zone of influence for the WCM discharge (Chapter 17 Marine Environment, paragraph 17.34.7, Environmental Statement, 2018). This is the case even when the outfall is fully exposed at low tide. Due to the separation distance and the very small volume of this discharge, a significant in-combination effect is not predicted to occur</p>		

Solway Firth pSPA – construction phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>(Chapter 17 Marine Environment, paragraph 17.34.8, Environmental Statement, 2018).</p> <p>A United Utilities pumping station discharge (to Saltom Bay) is also outside the zone of influence for the WCM discharge (Chapter 17 Marine Environment, paragraph 17.34.7, Environmental Statement, 2018). The pumping station may only discharge to sea in emergency circumstances when the pumping station is inoperative. No discharge occurs under normal circumstances. Due to the operational restrictions on this outfall, a significant in-combination effect is not predicted (Chapter 17 Marine Environment, paragraph 17.34.9, Environmental Statement, 2018).</p> <p>The Sellafield outfalls extend ~2.1 km from shore into the north-eastern Irish Sea and are located approximately 14.5 km directly south of the Saltom Bay discharge point (~17 km by sea). The Sellafield discharge outfall (at Seascale) is therefore also outside the zone of influence for the WCM discharge (Chapter 17 Marine Environment, paragraph 17.34.7, Environmental Statement, 2018). An in-combination effect is not predicted to occur due to the separation distance (Chapter 17 Marine Environment, paragraph 17.34.11, Environmental Statement, 2018).</p> <p>The United Utilities wastewater treatment works discharge (at Parton, north of Whitehaven) is located approximately 5 km from the proposed discharge point in Saltom Bay. The discharge point of this outfall is therefore also outside the zone of influence for the WCM discharge (Chapter 17 Marine Environment, paragraph 17.34.7, Environmental Statement, 2018).</p>		

Solway Firth pSPA – construction phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>Furthermore, the existing sewage discharge is discharged via diffuser(s) at a distance of ~1.9 km from shore, in the main current flows of the Solway Firth, and has an initial dilution factor of 50, which is generally considered appropriate for secondary treated sewage effluent. The United Utilities wastewater treatment works discharge is therefore considered to have sufficient initial and secondary mixing to ensure that it will not produce cumulative or in-combination impacts with the Saltom Bay discharge. (Chapter 17 Marine Environment, paragraph 17.34.10, Environmental Statement, 2018).</p> <p>There are no other projects which CCC is aware of in the marine environment in the proximity of the proposed mine that need to be included in an in-combination assessment. The NuGen Moorside development is currently on hold, and timescales, the nature and scope of the project, and its potential impacts are unknown. Therefore, no cumulative impact assessment is provided for this development.</p> <p>It is concluded that the discharge will not have a significant effect on the marine environment, either alone or in combination with other discharges from other plans or projects (Chapter 17 Marine Environment, Environmental Statement, sections 17.29.8 to 17.29.11 and 17.34.7, West Cumbria Mining, 2018).</p> <p>It is concluded that there will be no adverse effect on the integrity of the pSPA (through impacts on the populations of the pSPA qualifying species or through impacts on supporting habitats or species) through this pathway alone or in combination with other plans or projects.</p>		

Solway Firth pSPA – construction phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
4	Direct loss of or damage to marine habitat or disturbance to marine species from scouring and/or sedimentation from any discharges via Pow Beck	Potential effect on pSPA marine birds both within pSPA boundary and surrounding functional habitat through impacts on prey availability	<p>The proposed development will not impact directly on any part of the Solway Firth pSPA. Data collected through desk study complemented by survey data collected during various surveys carried out during the period 2015 to 2018 have led to the conclusion that no parts of the land at the development site provide supporting habitat for pSPA birds (BSG Ecology, 2018).</p> <p>Impacts on marine habitat or disturbance to marine species from scouring and/or sedimentation are, however, possible at the point where Pow Beck discharges to the sea to the south of St Bees (approximately 2.8 km downstream of the development), as a result of the discharge of surface water made to connected watercourses from the conveyor and RLF.</p> <p>Surface water flows, if uncontrolled, have the potential to entrain sediments and contaminants generated by the construction of the proposed development, which may have negative impacts on marine water quality and marine biota. In addition, the flows themselves, if increased, will have the potential to cause scouring around the mouth of Pow Beck.</p> <p>In order to minimise potential scour, discharge and control measures will be adopted at the conveyor and rail loading facility sites (Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, sections 6.2 and 6.3, Flood Risk Assessment and Drainage Strategy, Environmental Statement, West Cumbria Mining, 2018; Sections 5.7 and 5.10 of the Draft Environmental Management Plan - Appendix E to Chapter 5 Project Description, Environmental Statement, West Cumbria Mining, 2018).</p>	Yes	Yes

Solway Firth pSPA – construction phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>Bellhouse Gill and an unnamed tributary of the Pow Beck (both ephemeral watercourses) are intersected by the conveyor route. The conveyor will be buried beneath these two ephemeral watercourses. During the construction phase, the watercourses will be diverted around the construction area. There will therefore be no increases in flow rates or discharge volumes to Pow Beck, and hence no impacts at St Bees beach due to scour are predicted.</p> <p>During the construction phase, surface water runoff at the rail loading facility (RLF) site will be retained on-site in attenuation lagoons. Surface discharges to Pow Beck will be at a reduced rate compared to the current greenfield runoff rates.</p> <p>Consequently impacts associated with scour at the mouth of the Pow Beck at St Bees Beach are not predicted to occur (Chapter 17 Marine Environment, Environmental Statement, sections 17.29.20 to 17.29.23, West Cumbria Mining, 2018).</p> <p>It is concluded that there will be no adverse effect on the integrity of the pSPA (through impacts on the populations of the pSPA qualifying species or through impacts on supporting habitats or species) through this pathway alone or in combination with other plans or projects.</p> <p>In relation to the risk of scouring there is predicted to be no impact at the point where the Pow Beck discharges to the sea from WCM's project and so no risk of any in combination impact.</p>		
5	Dust and other airborne contamination of	Potential effect on pSPA marine birds both within pSPA	Please see paragraphs 6.131 et seq in Chapter 6, which provide a detailed assessment of the effects of dust.	Yes	Yes

Solway Firth pSPA – construction phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
	marine and terrestrial habitats – MMS/RLF/UC	boundary and surrounding functional habitat through impacts on prey availability	<p>Please see paragraphs 6.135 et seq in Chapter 6, which provide a detailed assessment of the effects of NOx.</p> <p>Please see paragraphs 6.139 et seq in Chapter 6, which provide a detailed assessment of the effects of N deposition.</p> <p>It is important to note that the analysis of air quality impacts presented in the above sections represents, as is legally required, a cumulative assessment of the proposed development (i.e. in combination with other plans and projects). This covers dust, traffic, and other operational controlled emissions, and is explained in detail in the air quality assessment (Chapter 15 Air Quality, section 15.7, paragraph 15.7.1 - 15.7.4 [dust], paragraph 15.7.5 – 15.7.10 [traffic], paragraph 15.7.11 – 15.7.12 [controlled emissions], Environmental Statement, 2018)).</p>		
6	Deterioration of marine water quality as a result of sediment-laden surface water run-off during remediation and construction – via Saltom Bay outfall	<p>Potential effect on pSPA marine birds within pSPA boundary and adjacent functional habitat including impacts on prey availability through:</p> <p>Mobilisation of underground contaminants disturbed during remediation works</p>	<p>The proposed development will not impact directly on any part of the Solway Firth pSPA; however, impacts on marine water quality are possible as a result of discharges of surface water made through the existing sea outfall pipe.</p> <p>Data collected through desk study complemented by survey data collected during various surveys carried out during the period 2015 to 2018 have led to the conclusion that no parts of the land at the development site provide supporting habitat for pSPA birds (BSG Ecology, 2018).</p> <p>Prior to the main construction period it is planned that a 6 month remediation phase will be required to treat pockets of contamination which may remain in areas of the site. During the</p>	Yes	Yes

Solway Firth pSPA – construction phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
		Escape of sediment entrained surface water during construction works	<p>remediation works, working areas will be fully covered to prevent rainwater ingress. This will ensure that no sediments are mobilised or transported by surface water. Areas of the site which are not being remediated will continue to drain as they do currently (Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, Flood Risk Assessment and Drainage Strategy, Section 6.1.4.1, Environmental Statement, West Cumbria Mining, 2018).</p> <p>Consequently no significant effects from sediment-laden surface water are expected on the marine environment during this remediation phase (Chapter 17 Marine Environment, paragraph 17.29.6, Environmental Statement, West Cumbria Mining, 2018).</p> <p>In the absence of mitigation the release of sediment-laden surface water into the marine environment could potentially impact on pSPA qualifying features directly (if they are present in the vicinity of the discharge pipe), for example as a result of habitat deterioration due to sediment-laden water, or indirectly, by impacting on the prey species or habitats that pSPA qualifying features depend upon .</p> <p>However, the effects of suspended solids on the marine environment will be fully mitigated during the construction phase of the development through best practice measures that will be adopted by the appointed contractor. Temporary settlement lagoons will be installed to collect surface water prior to discharge to remove potential suspended solids and ensure that discharge permit levels are met (Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, Flood Risk Assessment and Drainage Strategy, Section 6.1.4.2, Environmental Statement,</p>		

Solway Firth pSPA – construction phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>West Cumbria Mining, 2018). Water which has passed through oil and silt traps will be discharged using the existing outfall. Control measures including standard construction site environmental management (Sections 5.7 and 5.10 of the Draft Environmental Management Plan - Appendix E to Chapter 5 Project Description, Environmental Statement, West Cumbria Mining, 2018) will be implemented.</p> <p>Discharges during the construction phase will also be temporary in nature, i.e. they will only occur for the duration of the construction period, which is expected to be about 2 years, and at times when rainfall cannot be used in the construction processes (for example concrete mixing, damping down of roads and stockpiles etc).</p> <p>Modelling work has concluded that the Zone of Influence of the discharge into the sea, when combined with the existing leachate discharge, is 162m from the outfall, which means that the Solway Firth pSPA and its qualifying features will not be directly impacted (Chapter 17 Marine Environment, Environmental Statement, section 17.34.7 et seq, West Cumbria Mining, 2018). The discharge will be at a maximum flow rate of 25 l/s (Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, Flood Risk Assessment and Drainage Strategy, section 6.1.4.2 et seq, Environmental Statement, West Cumbria Mining, 2018). As the proposed discharge is not expected to have a significant effect on marine fauna, no indirect impacts on pSPA qualifying features are expected either, e.g. as a result of impacts on prey species.</p> <p>The proposed mitigation measures and the maximum discharge</p>		

Solway Firth pSPA – construction phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>rate (together with rapid mixing and dispersal in the marine environment) will ensure that the effects of the discharge are limited in their extent. No significant effects are likely on the marine environment (Chapter 17 Marine Environment, paragraph 17.29.6 to 17.29.7, Environmental Statement, West Cumbria Mining, 2018), indeed any such impact is regarded as negligible. Consequently it is not expected that the discharge of sediment laden surface water will impact directly or indirectly on the pSPA's population of qualifying features or their supporting habitats or species.</p> <p>The hydrological assessment has concluded that, with respect to groundwater and surface water, no pathway is considered to exist between the proposed development and any other proposed development (Chapter 12 Hydrology & Hydrogeology, Section 12.8, Environmental Statement, West Cumbria Mining, 2018).</p> <p>As such, an in-combination effect with other plans or projects is considered very unlikely, however, to ensure a comprehensive assessment, other discharges from other plans and projects have also been considered (if they include a proposed discharge to sea which could combine with the 162m zone of influence from the Saltom Bay outfall - Chapter 17 Marine Environment, Environmental Statement, section 17.34.1 et seq, West Cumbria Mining, 2018). The zone of influence (ZOI) of the proposed surface water runoff discharge to Saltom Bay has been calculated as approximately 162 m and is over 8 km (by sea) from the mouth of Pow Beck. Hence no in-combination effect is predicted between the two sources of surface water runoff associated with the proposed development.</p>		

Solway Firth pSPA – construction phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>The following licensable discharges to sea are within the vicinity of Saltom Bay and have the potential to interact with the surface water runoff discharges from the Saltom Bay outfall associated with the proposed development (Chapter 17 , paragraph 17.34, of the Environmental Statement:</p> <p>A private sewer discharge outfall is located approximately 350 m from the proposed WCM discharge point and it is permitted to discharge no more than 0.2 m³ per day. The permit associated with this discharge states that the discharge must have no adverse visible effect on the receiving environment. Modelling shows that the private sewer discharge from a pharmacy in Kells (to Saltom Bay) is outside the zone of influence for the WCM discharge (Chapter 17 Marine Environment, paragraph 17.34.7, Environmental Statement, 2018). This is the case even when the outfall is fully exposed at low tide. Due to the separation distance and the very small volume of this discharge, a significant in-combination effect is not predicted to occur (Chapter 17 Marine Environment, paragraph 17.34.8, Environmental Statement, 2018).</p> <p>A United Utilities pumping station discharge (to Saltom Bay) is also outside the zone of influence for the WCM discharge (Chapter 17 Marine Environment, paragraph 17.34.7, Environmental Statement, 2018). The pumping station may only discharge to sea in emergency circumstances when the pumping station is inoperative. No discharge occurs under normal circumstances. Due to the operational restrictions on this outfall, a significant in-combination effect is not predicted</p>		

Solway Firth pSPA – construction phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>(Chapter 17 Marine Environment, paragraph 17.34.9, Environmental Statement, 2018).</p> <p>The Sellafield outfalls extend ~2.1 km from shore into the north-eastern Irish Sea and are located approximately 14.5 km directly south of the Saltom Bay discharge point (~17 km by sea). The Sellafield discharge outfall (at Seascale) is therefore also outside the zone of influence for the WCM discharge (Chapter 17 Marine Environment, paragraph 17.34.7, Environmental Statement, 2018). An in-combination effect is not predicted to occur due to the separation distance (Chapter 17 Marine Environment, paragraph 17.34.11, Environmental Statement, 2018).</p> <p>The United Utilities wastewater treatment works discharge (at Parton, north of Whitehaven) is located approximately 5 km from the proposed discharge point in Saltom Bay. The discharge point of this outfall is therefore also outside the zone of influence for the WCM discharge (Chapter 17 Marine Environment, paragraph 17.34.7, Environmental Statement, 2018). Furthermore, the existing sewage discharge is discharged via diffuser(s) at a distance of ~1.9 km from shore, in the main current flows of the Solway Firth, and has an initial dilution factor of 50, which is generally considered appropriate for secondary treated sewage effluent. The United Utilities wastewater treatment works discharge is therefore considered to have sufficient initial and secondary mixing to ensure that it will not produce cumulative or in-combination impacts with the Saltom Bay discharge. (Chapter 17 Marine Environment, paragraph 17.34.10, Environmental Statement, 2018).</p> <p>There are no other projects which CCC is aware of in the marine</p>		

Solway Firth pSPA – construction phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>environment in the proximity of the proposed mine that need to be included in an in-combination assessment. The NuGen Moorside development is currently on hold, and timescales, the nature and scope of the project, and its potential impacts are unknown. Therefore, no cumulative impact assessment is provided for this development. It is therefore concluded that the discharge will not have a significant effect on the marine environment, either alone or in combination with other discharges from other plans or projects (Chapter 17 Marine Environment, Environmental Statement, sections 17.29.8 to 17.29.11 and 17.34.7, West Cumbria Mining, 2018).</p> <p>It is concluded that there will be no adverse effect on the integrity of the pSPA (through impacts on the populations of the pSPA qualifying species or through impacts on supporting habitats or species) through this pathway alone or in combination with other plans or projects.</p>		
7	Deterioration of marine water quality as a result of disturbance of contaminated land and mobilisation of pollutants during construction (including remediation works) on brownfield land (including changes in pH, temperature,	<p>Potential effect on pSPA marine birds within pSPA boundary and adjacent functional habitat including impacts on prey availability through:</p> <p>Mobilisation of underground contaminants disturbed during</p>	<p>The proposed development will not impact directly on any part of the Solway Firth pSPA; however, impacts on marine water quality are possible as a result of discharges of surface water made through the existing sea outfall pipe.</p> <p>Data collected through desk study complemented by survey data collected during various surveys carried out during the period 2015 to 2018 have led to the conclusion that no parts of the land at the development site provide supporting habitat for pSPA birds (BSG Ecology, 2018).</p> <p>Prior to the main construction period it is planned that a 6 month</p>	Yes	Yes

Solway Firth pSPA – construction phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
	salinity, and dissolved oxygen) discharged via Saltom Bay outfall	remediation works Potential for pollution incidents from spillages, leakages etc from stored chemicals, fuel and oils on site.	<p>remediation phase will be required to treat pockets of contamination which may remain in areas of the site.</p> <p>In the absence of mitigation the potential release of pollutants into the marine environment could potentially impact on pSPA qualifying features directly (if they are present in the vicinity of the discharge pipe), for example as a result of toxic effects, or indirectly, by impacting on the prey species or habitats that pSPA qualifying features depend upon.</p> <p>There are potential impacts associated with the discharge and these are related to non-toxic inputs. These include the effects of pH, temperature, salinity and dissolved oxygen. The marine assessment has concluded that the proposed discharge of surface water into the marine environment is not likely to have a significant effect on pH, salinity, water temperature of dissolved oxygen (Chapter 17 Marine Environment, Environmental Statement, West Cumbria Mining, 2018, paragraphs 17.29.12 [pH], 17.29.14-17 [salinity], 17.29.13 [water temperature], 17.29.18 [dissolved oxygen]).</p> <p>Pollution effects during the construction phase of the development (including remediation works) will be fully mitigated through the adoption of best practice pollution prevention measures that will be adopted by the appointed contractor. This includes the collection and settlement of surface water and the adoption of best practice pollution prevention measures (Draft Environmental Management Plan - Appendix E to Chapter 5 Project Description, Sections 5.7 and 5.10, Environmental Statement, West Cumbria Mining, 2018).</p>		

Solway Firth pSPA – construction phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>During the remediation works, working areas will be fully covered to prevent rainwater ingress. This will ensure that no contaminants are mobilised or transported by surface water. Areas of the site which are not being remediated will continue to drain as they do currently (Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, Flood Risk Assessment and Drainage Strategy, Section 6.1.4.1, Environmental Statement, West Cumbria Mining, 2018).</p> <p>Once the remediation phase is complete, there will be no legacy contaminants on site. Consequently there will be no mechanism whereby legacy contaminants could be discharged into the marine environment.</p> <p>Discharges during the construction phase will be temporary in nature, i.e. they will only occur for the duration of the construction period, which is expected to be about 2 years, and at times when rainfall cannot be used in the construction processes (for example concrete mixing, damping down of roads and stockpiles etc). Modelling work has concluded that the Zone of Influence of the discharge into the sea, when combined with the existing leachate discharge, is 162m from the outfall, which means that the Solway Firth pSPA and its qualifying features will not be directly impacted (Chapter 17 Marine Environment, Environmental Statement, section 17.34.7 et seq, West Cumbria Mining, 2018). The discharge will be at a maximum flow rate of 25 l/s (Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, Flood Risk Assessment and Drainage Strategy, section 6.1.4.2 et seq, Environmental Statement, West Cumbria Mining, 2018).</p>		

Solway Firth pSPA – construction phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>As the proposed discharge is not expected to have a significant effect on marine fauna, no indirect impacts on pSPA qualifying features are expected either, e.g. as a result of impacts on prey species.</p> <p>The proposed mitigation measures and the maximum discharge rate (together with rapid mixing and dispersal in the marine environment) will ensure that the effects of the discharge are limited in their extent. No significant effects are likely on the marine environment (Chapter 17 Marine Environment, paragraphs 17.29.12 - 17.29.18, Environmental Statement, West Cumbria Mining, 2018), indeed any such impact is regarded as negligible. Consequently, it is not expected that the discharge of pollutants (including changes in pH, temperature, salinity, and dissolved oxygen) will impact directly or indirectly on pSPA populations of qualifying features or their supporting habitats or species.</p> <p>The hydrological assessment has concluded that, with respect to groundwater and surface water, no pathway is considered to exist between the proposed development and any other proposed development (Chapter 12 Hydrology & Hydrogeology, Section 12.8, Environmental Statement, West Cumbria Mining, 2018).</p> <p>As such, an in-combination effect with other plans or projects is considered very unlikely, however, to ensure a comprehensive assessment, other discharges from other plans and projects have also been considered (if they include a proposed discharge to sea which could combine with the 162m zone of influence</p>		

Solway Firth pSPA – construction phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>from the Saltom Bay outfall) (Chapter 17 Marine Environment, Environmental Statement, section 17.34.1 et seq, West Cumbria Mining, 2018).The zone of influence (ZOI) of the proposed surface water runoff discharge to Saltom Bay has been calculated as approximately 162 m and is over 8 km (by sea) from the mouth of Pow Beck. Hence no in-combination effect is predicted between the two sources of surface water runoff associated with the proposed development.</p> <p>The following licensable discharges to sea are within the vicinity of Saltom Bay and have the potential to interact with the surface water runoff discharges from the Saltom Bay outfall associated with the proposed development (Chapter 17 , paragraph 17.34, of the Environmental Statement):</p> <p>A private sewer discharge outfall is located approximately 350 m from the proposed WCM discharge point and it is permitted to discharge no more than 0.2 m³ per day. The permit associated with this discharge states that the discharge must have no adverse visible effect on the receiving environment. Modelling shows that the private sewer discharge from a pharmacy in Kells (to Saltom Bay) is outside the zone of influence for the WCM discharge (Chapter 17 Marine Environment, paragraph 17.34.7, Environmental Statement, 2018). This is the case even when the outfall is fully exposed at low tide. Due to the separation distance and the very small volume of this discharge, a significant in-combination effect is not predicted to occur (Chapter 17 Marine Environment, paragraph 17.34.8, Environmental Statement, 2018).</p>		

Solway Firth pSPA – construction phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>A United Utilities pumping station discharge (to Saltom Bay) is also outside the zone of influence for the WCM discharge (Chapter 17 Marine Environment, paragraph 17.34.7, Environmental Statement, 2018). The pumping station may only discharge to sea in emergency circumstances when the pumping station is inoperative. No discharge occurs under normal circumstances. Due to the operational restrictions on this outfall, a significant in-combination effect is not predicted (Chapter 17 Marine Environment, paragraph 17.34.9, Environmental Statement, 2018).</p> <p>The Sellafield outfalls extend ~2.1 km from shore into the north-eastern Irish Sea and are located approximately 14.5 km directly south of the Saltom Bay discharge point (~17 km by sea). The Sellafield discharge outfall (at Seascale) is therefore also outside the zone of influence for the WCM discharge (Chapter 17 Marine Environment, paragraph 17.34.7, Environmental Statement, 2018). An in-combination effect is not predicted to occur due to the separation distance (Chapter 17 Marine Environment, paragraph 17.34.11, Environmental Statement, 2018).</p> <p>The United Utilities wastewater treatment works discharge (at Parton, north of Whitehaven) is located approximately 5 km from the proposed discharge point in Saltom Bay. The discharge point of this outfall is therefore also outside the zone of influence for the WCM discharge (Chapter 17 Marine Environment, paragraph 17.34.7, Environmental Statement, 2018). Furthermore, the existing sewage discharge is discharged via diffuser(s) at a distance of ~1.9 km from shore, in the main</p>		

Solway Firth pSPA – construction phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>current flows of the Solway Firth, and has an initial dilution factor of 50, which is generally considered appropriate for secondary treated sewage effluent. The United Utilities wastewater treatment works discharge is therefore considered to have sufficient initial and secondary mixing to ensure that it will not produce cumulative or in-combination impacts with the Saltom Bay discharge. (Chapter 17 Marine Environment, paragraph 17.34.10, Environmental Statement, 2018).</p> <p>There are no other projects which CCC is aware of in the marine environment in the proximity of the proposed mine that need to be included in an in-combination assessment. The NuGen Moorside development is currently on hold, and timescales, the nature and scope of the project, and its potential impacts are unknown. Therefore, no cumulative impact assessment is provided for this development.</p> <p>It is concluded that there will be no adverse effect on the integrity of the pSPA (through impacts on the populations of the pSPA qualifying species or through impacts on supporting habitats or species) through this pathway alone or in combination with other plans or projects.</p>		
8	Deterioration of marine water quality as a result of sediment-laden surface water run-off during construction, via Pow Beck	Potential effect on pSPA marine birds within pSPA boundary and adjacent functional habitat including impacts on prey	The proposed development will not impact directly on any part of the Solway Firth pSPA; however, impacts on marine water quality are possible as a result of discharges of surface water made from the RLF and Conveyor to the Bellhouse Gill and Pow Beck, which eventually discharges to the sea to the south of St Bees approximately 2.8 km downstream of the development.	Yes	Yes

Solway Firth pSPA – construction phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
	catchment	availability through: Construction site surface water discharge and run-off	<p>Data collected through desk study complemented by survey data collected during various surveys carried out during the period 2015 to 2018 have led to the conclusion that no parts of the land at the development site provide supporting habitat for pSPA birds (BSG Ecology, 2018).</p> <p>In the absence of mitigation the release of sediment-laden surface water via the Pow Beck into the marine environment could potentially impact on pSPA qualifying features directly (if they are present in the vicinity of the Pow Beck where it discharges to sea at St Bees Beach), for example as a result of habitat deterioration due to sediment-laden water, or indirectly, by impacting on the prey species that pSPA qualifying features depend upon.</p> <p>The effects of suspended solids (transported via the Pow Beck) on the marine environment will be fully mitigated through measures that will be adopted during the construction phase of the development. This includes the collection and treatment of surface water by settlement and the adoption of best practice pollution prevention measures (Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, section 6.2.1.1, Flood Risk Assessment and Drainage Strategy, Environmental Statement, West Cumbria Mining, 2018; Chapter 5 Project Description, Appendix E, Draft Environmental Management Plan, sections 5.6 and 5.7). Details of the discharge and control measures at the conveyor and rail loading facility sites are described in Chapter 12 Hydrology & Hydrogeology, Appendix 12-7, Flood Risk Assessment and Drainage Strategy, Sections 6.2 and 6.3,</p>		

Solway Firth pSPA – construction phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>Environmental Statement, West Cumbria Mining, 2018.</p> <p>Bellhouse Gill and an unnamed tributary of the Pow Beck (both ephemeral watercourses) are intersected by the conveyor route. The conveyor will be buried beneath these ephemeral watercourses. Following construction, the flow regime at these locations will return to pre-development conditions.</p> <p>During the construction phase, the watercourses will be diverted around the construction area to allow for the continuation of flow over this time. There will therefore be no increases in flow rates or discharge volumes to Pow Beck. Water pollution controls at the conveyor site will avoid/minimise sediment release to Pow Beck and hence the marine environment.</p> <p>It is proposed to create a temporary lagoon for the storage and settlement of surface water from the Conveyor and Rail Loading Facility during the construction phase (Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, Flood Risk Assessment and Drainage Strategy, Table 6.1, Environmental Statement, West Cumbria Mining, 2018). Dilution effects within Bellhouse Gill and Pow Beck will also reduce the environmental concentrations of any contaminants present (though this is considered unlikely once good practice measures are in place) to the point where they are not predicted to have any significant impact on the marine environment (Chapter 17 Marine Environment, paragraph 17.29.21 – 17.29.23, Environmental Statement, West Cumbria Mining, 2018). Furthermore, discharges during the construction phase will be temporary in nature, i.e. they will only occur for the duration of the construction period, which is</p>		

Solway Firth pSPA – construction phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>expected to be about 2 years, and at times when rainfall cannot be used in the construction processes (for example concrete mixing, damping down of roads and stockpiles etc).</p> <p>The implementation of these good practice measures, in conjunction with mixing and dilution effects of the freshwater watercourses, mean that , no significant pollution impact on the marine environment is predicted via the Pow Beck pathway (see Chapter 17, Marine Environment, paragraph 17.29.22, Environmental Statement, 2018), indeed any such impact is regarded as negligible. Consequently it is not expected that the discharge to Pow Beck will impact directly or indirectly on pSPA populations of qualifying features or their supporting habitats or species.</p> <p>The hydrological assessment has concluded that, with respect to groundwater and surface water, no pathway is considered to exist between the proposed development and any other proposed development (Chapter 12 Hydrology & Hydrogeology, Section 12.8, Environmental Statement, West Cumbria Mining, 2018). As such an in-combination effect with other plans or projects is considered very unlikely, however, to ensure a comprehensive assessment, nearby licensable discharges to sea in the vicinity of the mouth of Pow Beck have nevertheless been investigated. The zone of influence (ZOI) of the proposed surface water runoff discharge to Saltom Bay has been calculated as approximately 162 m and is over 8 km (by sea) from the mouth of Pow Beck. Hence no in-combination effect is predicted between the two sources of surface water runoff associated with the proposed development. The closest licensed</p>		

Solway Firth pSPA – construction phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>discharge to the mouth of Pow Beck is a United Utilities pumping station located at Nethertown, which has a permit to discharge to sea (permit no. 017470153) approximately 4 km south of the mouth of Pow Beck. However, under the conditions of the permit, the pumping station may only discharge to sea in emergency circumstances when the pumping station is inoperative as a result of e.g. electrical failure or rising main failure. No discharge occurs under normal circumstances. For this reason this discharge has been scoped out of the in-combination impact assessment.</p> <p>The United Utilities WwTW located at Braystones, south of Nethertown, discharges to sea via a long sea outfall (permit no. 017470152). The discharge point of this outfall is located approximately 7 km south from the mouth of Pow Beck and hence any combined effect between it and any discharges made via Pow Beck is very unlikely. Furthermore, the existing sewage discharge is discharged via diffuser(s) at a distance of ~2 km from shore and has an initial dilution factor generally considered appropriate for secondary treated sewage effluent. The existing discharge is therefore considered to have sufficient initial and secondary mixing to ensure that it will not produce cumulative or in-combination impacts with other discharges.</p> <p>The Sellafeld outfalls extend ~2.1 km from shore into the north-eastern Irish Sea and are located approximately 8.8 km from the mouth of Pow Beck and hence, again, it is considered highly unlikely that the two plumes will interact. Furthermore, the two discharges are not similar; the proposed discharges to Pow Beck are ambient temperature freshwater which, with good</p>		

Solway Firth pSPA – construction phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>practice guidelines in place, will not be contaminated, while the Sellafield discharge is a cooling water discharge, i.e. warm seawater. There is therefore no realistic likelihood of in-combination effects between the two discharges.</p> <p>There are no other projects which CCC is aware of in the marine environment in the proximity of the proposed mine that need to be included in an in-combination assessment. The NuGen Moorside development is currently on hold, and timescales, the nature and scope of the project, and its potential impacts are unknown. Therefore, no cumulative impact assessment is provided for this development.</p> <p>It is concluded that there will be no adverse effect on the integrity of the pSPA (through impacts on the populations of the pSPA qualifying species or through impacts on supporting habitats or species) through this pathway alone or in combination with other plans or projects.</p>		
9	Deterioration of marine water quality as a result of disturbance of contaminated land and mobilisation of pollutants during construction (including remediation works) on brownfield land	<p>Potential effect on pSPA marine birds within pSPA boundary and adjacent functional habitat including impacts on prey availability through:</p> <p>Mobilisation of underground</p>	<p>The proposed development will not impact directly on any part of the Solway Firth pSPA; however, impacts on marine water quality are possible as a result of discharges of surface water made from the RLF and Conveyor to the Bellhouse Gill and Pow Beck, which eventually discharges to the sea to the south of St Bees approximately 2.8 km downstream of the development.</p> <p>Data collected through desk study complemented by survey data collected during various surveys carried out during the period 2015 to 2018 have led to the conclusion that no parts of the land at the development site provide supporting habitat for pSPA</p>	Yes	Yes

Solway Firth pSPA – construction phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
	(including changes in pH, temperature, salinity, and dissolved oxygen) discharged via Pow Beck catchment	contaminants disturbed during remediation works Potential for pollution incidents from spillages, leakages etc from stored chemicals, fuel and oils on site.	birds (BSG Ecology, 2018). In the absence of mitigation the release of pollutants into the marine environment could potentially impact on pSPA qualifying features directly (if they are present in the vicinity of the Pow Beck where it discharges to sea), for example as a result of toxic effects, or indirectly, by impacting on the prey species that pSPA qualifying features depend upon. There are also potential impacts associated with the discharge are related to non-toxic inputs. These include the effects of pH, temperature, salinity and dissolved oxygen. Pollution effects during the construction phase of the development will be fully mitigated through the adoption of best practice pollution prevention measures that will be adopted by the appointed contractor. This includes the collection and settlement of surface water and the adoption of best practice pollution prevention measures (Draft Environmental Management Plan - Appendix E to Chapter 5 Project Description, Sections 5.7 and 5.10, Environmental Statement, West Cumbria Mining, 2018). Details of the discharge and control measures at the conveyor and rail loading facility sites are described in Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, Flood Risk Assessment and Drainage Strategy, Sections 6.2 and 6.3, Environmental Statement, West Cumbria Mining, 2018. Bellhouse Gill and an unnamed tributary of the Pow Beck (both ephemeral watercourses) are intersected by the conveyor route. The conveyor will be buried beneath these ephemeral watercourses; following construction, the flow regime at these locations will return to pre-development conditions.		

Solway Firth pSPA – construction phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>During the construction phase, the watercourses will be diverted around the construction area to allow for the continuation of flow over this time. There will therefore be no increases in flow rates or discharge volumes to Pow Beck. The conveyor route is enclosed, which will minimise the chance of contamination of local watercourses. Water pollution controls at the conveyor site and RLF, including the use of attenuation lagoons, will avoid/minimise pollutant release to Pow Beck and hence the marine environment.</p> <p>Dilution effects within Bellhouse Gill and Pow Beck will also reduce the environmental concentrations of any contaminants present (though this is considered unlikely once good practice measures are in place) to the point where they are not predicted to have any significant impact on the marine environment (Chapter 17 Marine Environment, paragraph 17.29.21 – 17.29.23, Environmental Statement, West Cumbria Mining, 2018).</p> <p>Furthermore, discharges during the construction phase will be temporary in nature, i.e. they will only occur for the duration of the construction period, which is expected to be about 2 years, and at times when rainfall cannot be used in the construction processes (for example concrete mixing, damping down of roads and stockpiles etc).</p> <p>The implementation of these good practice measures, in conjunction with mixing and dilution effects of the freshwater watercourses, mean that impacts on the marine environment</p>		

Solway Firth pSPA – construction phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>due to increases in contaminants are predicted to be negligible (Chapter 17 Marine Environment, paragraph 17.29.23, Environmental Statement, West Cumbria Mining, 2018). Consequently it not expected that the discharge of pollutants to Pow Beck (including changes in pH, temperature, salinity, and dissolved oxygen) will impact directly or indirectly on pSPA populations of qualifying features or their supporting habitats or species. The hydrological assessment has concluded that, with respect to groundwater and surface water, no pathway is considered to exist between the proposed development and any other proposed development (Chapter 12 Hydrology & Hydrogeology, Section 12.8, Environmental Statement, West Cumbria Mining, 2018). . As such an in-combination effect with other plans or projects is considered very unlikely, however, to ensure a comprehensive assessment, nearby licensable discharges to sea in the vicinity of the mouth of Pow Beck have nevertheless been investigated.</p> <p>The zone of influence (ZOI) of the proposed surface water runoff discharge to Saltom Bay has been calculated as approximately 162 m and is over 8 km (by sea) from the mouth of Pow Beck. Hence no in-combination effect is predicted between the two sources of surface water runoff associated with the proposed development.</p> <p>The closest licensed discharge to the mouth of Pow Beck is a United Utilities pumping station located at Nethertown, which has a permit to discharge to sea (permit no. 017470153) approximately 4 km south of the mouth of Pow Beck. However, under the conditions of the permit, the pumping station may only</p>		

Solway Firth pSPA – construction phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>discharge to sea in emergency circumstances when the pumping station is inoperative as a result of e.g. electrical failure or rising main failure. No discharge occurs under normal circumstances. For this reason this discharge has been scoped out of the in-combination impact assessment.</p> <p>The United Utilities WwTW located at Braystones, south of Nethertown, discharges to sea via a long sea outfall (permit no. 017470152). The discharge point of this outfall is located approximately 7 km south from the mouth of Pow Beck and hence any combined effect between it and any discharges made via Pow Beck is very unlikely. Furthermore, the existing sewage discharge is discharged via diffuser(s) at a distance of ~2 km from shore and has an initial dilution factor generally considered appropriate for secondary treated sewage effluent. The existing discharge is therefore considered to have sufficient initial and secondary mixing to ensure that it will not produce cumulative or in-combination impacts with other discharges.</p> <p>The Sellafield outfalls extend ~2.1 km from shore into the north-eastern Irish Sea and are located approximately 8.8 km from the mouth of Pow Beck and hence, again, it is considered highly unlikely that the two plumes will interact. Furthermore, the two discharges are not similar; the proposed discharges to Pow Beck are ambient temperature freshwater which, with good practice guidelines in place, will not be contaminated, while the Sellafield discharge is a cooling water discharge, i.e. warm seawater. There is therefore no realistic likelihood of in-combination effects between the two discharges.</p>		

Solway Firth pSPA – construction phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>There are no other projects which CCC is aware of in the marine environment in the proximity of the proposed mine that need to be included in an in-combination assessment. The NuGen Moorside development is currently on hold, and timescales, the nature and scope of the project, and its potential impacts are unknown. Therefore, no cumulative impact assessment is provided for this development.</p> <p>It is concluded that there will be no adverse effect on the integrity of the pSPA (through impacts on the populations of the pSPA qualifying species or through impacts on supporting habitats or species) through this pathway alone or in combination with other plans or projects.</p>		
10	Subsidence effects under the terrestrial environment	Subsidence under the terrestrial environment as a result of sub-surface mining activities	<p>No subsidence is predicted during the construction phase as no mining activity will have commenced.</p> <p>Please see paragraphs 6.166 et seq in Chapter 6, which provides an assessment of the effects of subsidence.</p>	Yes	Yes
11	Subsidence effects under the marine environment	Subsidence under the marine environment as a result of sub-surface mining activities	<p>No subsidence is predicted during the construction phase as no mining activity will have commenced.</p> <p>Please see paragraphs 6.166 et seq in Chapter 6, which provides an assessment of the effects of subsidence.</p>	Yes	Yes

Operation Phase

Table 3: Impact mechanisms and pathways during the operational phase of the development – Solway Firth pSPA

Solway Firth pSPA – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
1	Direct loss of or damage to terrestrial habitat – MMS, RLF/UC	Potential loss of terrestrial supporting habitat for pSPA birds through land-take	Please see paragraphs 6.19 et seq in Chapter 6, which provide a detailed assessment.	Yes	Yes
2	Disturbance of marine or terrestrial qualifying species (visual/noise/vibration) – MMS/RLF/UC/UM	<p>Possible effect on pSPA marine birds within pSPA boundary and functional habitat through: mining operations including driving, rail transfer, conveyor belt</p> <p>Possible effect on marine/intertidal/terrestrial habitat used by pSPA birds through: mining operations including sub- sea drilling.</p>	<p><u>Visual disturbance</u></p> <p>Please see paragraphs 6.36 et seq in Chapter 6, which provides a detailed assessment.</p> <p><u>Human presence</u></p> <p>Disturbance resulting from human presence is directly linked to visual disturbance, i.e. human presence is most likely to have an impact as a result of visual disturbance. Please see paragraphs 6.36 et seq in Chapter 6, which provides a detailed assessment.</p> <p><u>Noise and vibration</u></p> <p>The assessment of noise and vibration in Chapter 14 of the ES has been carried out taking into account designed-in mitigation measures, which include: the selection of low noise plant items; selection of wall and roof cladding constructions to minimise noise breakout from the plant buildings; use of high performance multi-layered cladding systems for</p>	Yes	Yes

Solway Firth pSPA – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>each part of the facility; selection of acoustic attenuated ventilation openings to minimise noise breakout from the plant buildings; incorporation of screening bunds (Chapter 14 Noise and Vibration, section 14.6.5, Environmental Statement, West Cumbria Mining, 2018).</p> <p>Data collected through desk study complemented by survey data collected during various surveys carried out during the period 2015 to 2018 have led to the conclusion that no parts of the land at the site provide terrestrial supporting habitat for pSPA birds. No impacts on pSPA birds are expected as there is no evidence that the land at the development site is functionally linked with the pSPA (i.e. it is not critical to or necessary for the ecological or behavioural functioning of the qualifying features for which a site has been designated). The closest point of the Solway Firth pSPA is 1.16 km to the north-west of the development land, which is sufficiently distant that noise and vibration related impacts on any qualifying features are not expected.</p> <p>Surveys have also found that the adjacent marine area is only used by small numbers of a limited range of pSPA species, e.g. common scoter, cormorant, common gull, herring gull (BSG Ecology, 2018). Whilst species for which the pSPA is qualified have been recorded, these were all outside the pSPA boundary and may well not form part of the pSPA population).</p> <p>During the operation of the site all required infrastructure will be in place and the site will be permanently occupied by people involved with the mining operation. Consequently any use of the site by pSPA birds will be because those birds can either tolerate or have become habituated to the activities that are taking place. It is therefore unlikely that SPA qualifying features using terrestrial areas will be impacted during the operation of</p>		

Solway Firth pSPA – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>the site.</p> <p>The noise and vibration assessment has concluded that during the operation phase, there are no predicted noise or vibration related impacts arising from the terrestrial elements of the proposed development that will impact on the Solway Firth pSPA (Chapter 14 Noise and Vibration, Environmental Statement, section 14.9.7, West Cumbria Mining). The noise assessment concludes that construction noise levels at the proposed SPA will be less than 20 dB(A) at the nearest point, which is low compared with prevailing background noise levels; for example, background noise levels in a rural area at night are typically of the order 30 Db(A) (Chapter 14 Noise and Vibration, Table A14.1.1, Environmental Statement, West Cumbria Mining, 2018).</p> <p>No impacts on pSPA birds are likely as there is no evidence that the land at the development site is functionally linked with the pSPA (i.e. it is not critical to or necessary for the ecological or behavioural functioning of the qualifying features for which a site has been designated). The closest point of the Solway Firth pSPA is 1.16 km to the north-west of the development land, which is sufficiently distant that noise and vibration related impacts on any qualifying features are not expected (see paragraphs 6.42 et seq in Chapter 6). Any future colonisation of the site by pSPA birds will take place irrespective of the construction that has previously taken place and the on-going disturbance.</p> <p>No operational phase noise and vibration related impacts are expected on marine receptors as the mining will be undertaken 400m under the sea bed (Chapter 17 Marine Environment, Environmental Statement, section 17.32.9 et seq, West Cumbria Mining, 2018). The source sound and vibration will propagate away from source (the underground mining</p>		

Solway Firth pSPA – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>area) in all directions and begin to attenuate, i.e. it will reduce as it travels away from source. This will occur by two principle methods; geometric spreading and material damping. As sound energy travels away from source, attenuation will occur through reflection and refraction as the sound wave passes through layers of differing density. A significant amount of the source sound and vibration will therefore attenuate as it travels through the >400 m of rock above the mine. Attenuation will also occur between the various layers within the rock as well as between the rock/sediment and sediment/water boundaries.</p> <p>No disturbance of pSPA birds using the marine environment is predicted due to attenuation that will take place within >400m of rock. Indirect impacts may occur if there are effects on prey species; however this is not expected (Chapter 17 Marine Environment, Environmental Statement, section 17.32.15 et seq, West Cumbria Mining, 2018). As such, an in-combination effect with other plans or projects is considered very unlikely. However, to ensure a comprehensive assessment, the following potential sources of marine noise have been considered which could, in combination with WCM's project, have an in combination effect on any European site via the noise / vibration impact pathway.</p> <p>A search has been carried out for Marine Management Organisation (MMO) active licences and current licence applications to identify any marine projects which could, in combination with WCM's project, have an in combination effect on any European site via the noise / vibration impact pathway. This has shown that there is no such project located within the MMO's northwest Marine Planning Area (inshore and offshore) that has the potential to have an in-combination effect with WCM's proposed development.</p>		

Solway Firth pSPA – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>The in-combination assessment has also considered the following existing potential sources of marine noise which may have the potential to interact with the noise / vibration impacts on marine species associated with the proposed development:</p> <p><u>Shipping</u>: There are no major shipping lanes in the area around the proposed development and local vessel traffic densities are considered to be low. There is significant vessel traffic associated with the ports in the vicinity of Morecambe Bay (~50 km to the south), however this mostly consists of relatively small supply ships and the nearest major port is Liverpool, >100 km to the south of the proposed development.</p> <p><u>Windfarms</u>: The closest operational windfarms located in the sea are Robin Rigg (~25 km to the north) and Walney (~38 km to the south).</p> <p><u>Military areas</u>: There are multiple military practice areas in the north-eastern Irish Sea, the closest of which include a firing practice area to the northwest of the proposed offshore mining area (~9 km at closest point), and the Eskmeals Range, located near Ravenglass, which is charted as extending to 1 km south of South Head. No restrictions are placed on the right to transit these areas at any time, and the practice areas are operated using a clear range procedure, i.e. exercises and firing only take place when the areas are considered to be clear of all shipping. It can therefore be assumed that these areas are used only infrequently.</p> <p>All of these listed activities currently contribute to baseline noise conditions in the area of sea above the proposed offshore mining area; however, these are all intermittent sources of noise that are expected to have a temporary effect on the marine environment. Furthermore, WCM</p>		

Solway Firth pSPA – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>is not aware of any proposals to: increase shipping movements in the area; extend or increase activity associated with the nearest offshore windfarm sites or; increase use of nearby firing ranges and military practice areas.</p> <p>It is therefore concluded that sound and vibration arising from the proposed development will not have an effect on any European site in combination with other plans and projects.</p> <p>It is concluded that there will be no adverse effect on the integrity of the pSPA (through impacts on the populations of the pSPA qualifying species or through impacts on supporting habitats or species) through this pathway alone or in combination with other plans or projects.</p>		
3	Direct loss of or damage to marine habitat or disturbance to marine species from scouring and/or sedimentation from any discharges from the existing discharge pipe into Saltom Bay	Potential effect on pSPA marine birds both within pSPA boundary and surrounding functional habitat through Impacts on prey availability.	<p>The proposed development will not impact directly on any part of the Solway Firth pSPA; however, impacts on marine habitat or disturbance to marine species from scouring and/or sedimentation are possible as a result of discharges of surface water made through the existing sea outfall pipe.</p> <p>Data collected through desk study complemented by survey data collected during various surveys carried out during the period 2015 to 2018 have led to the conclusion that no parts of the land at the development site provide supporting habitat for pSPA birds (BSG Ecology, 2018).</p> <p>All surface water from areas of hard-standing and roofs will be captured during the operation phase and directed to an underground storage tank via oil interceptors and silt traps prior to discharge to sea using the existing outfall. In order to minimise potential scour, the maximum flow</p>	Yes	Yes

Solway Firth pSPA – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>rate of the discharge will be limited to 25 l/s. In periods of heavy rainfall, flows will be attenuated on site through storage (Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, Flood Risk Assessment and Drainage Strategy, section 6.1.4.3 et seq, Environmental Statement, West Cumbria Mining, 2018; Chapter 17 Marine Environment, Environmental Statement, section 17.31, West Cumbria Mining, 2018).</p> <p>However, following heavy rainfall excess surface water runoff will need to be discharged to sea via the existing outfall in Saltom Bay. The discharge pipe runs down the foreshore and terminates in the intertidal zone (it is only fully exposed around low water springs tides).</p> <p>In order to minimise potential scour, the maximum flow rate of the discharge will be limited to 25 l/s, which will only be reached during and following heavy rainfall events.</p> <p>During the operational phase it is expected that there will be significant consumption of attenuated surface water for mining related activities, such as washing coal and preparation of the paste for backfill. It is therefore expected that the discharge of surface water will be significantly lower than the consented discharge rate (Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, Flood Risk Assessment and Drainage Strategy, section 6.1.4.3, Environmental Statement, West Cumbria Mining, 2018).</p> <p>The proposed development will minimise the potential for scour on the intertidal area around the outfall by limiting, wherever practicable, surface water discharge to when the outlet point is submerged. By only discharging surface water when the outlet point is submerged, the potential for scour at the proposed flow rates will be minimised (Chapter</p>		

Solway Firth pSPA – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>17 Marine Environment, Environmental Statement, section 17.31.5, West Cumbria Mining, 2018).</p> <p>When the discharge point is exposed (i.e. not submerged), modelling results indicate that the proposed flow rate would be sufficient to mobilise fine sand material (i.e. no significant sediment re-suspension is likely). However, the sediments at the discharge point location consist of coarse sands (and cobbles and boulders), and so any re-suspended particles are likely to settle out very quickly. It is therefore concluded that any effect on water quality and biota will be localised and of minor significance (Chapter 17 Marine Environment, Environmental Statement, section 17.31.3, West Cumbria Mining, 2018).</p> <p>Modelling work has concluded that the Zone of Influence of the discharge into the sea, when combined with the existing leachate discharge, is 162m from the outfall, which means that the Solway Firth pSPA and its qualifying features will not be directly impacted (Chapter 17 Marine Environment, Environmental Statement, section 17.34.7 et seq, West Cumbria Mining, 2018). Furthermore, as the proposed discharge is not expected to have a significant effect on marine fauna, no indirect impacts on pSPA qualifying features are expected either, e.g. as a result of impacts on prey species. As such, an in-combination effect with other plans or projects is considered very unlikely, however to ensure a comprehensive assessment, discharges from other plans and projects have also been considered (if they include a proposed discharge to sea which could combine with the 162m zone of influence from the Saltom Bay outfall - Chapter 17 Marine Environment, Environmental Statement, sections 17.34.1 to 17.34.5, West Cumbria Mining, 2018).</p> <p>The zone of influence (ZOI) of the proposed surface water runoff</p>		

Solway Firth pSPA – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>discharge to Saltom Bay has been calculated as approximately 162 m and is over 8 km (by sea) from the mouth of Pow Beck. Hence no in-combination effect is predicted between the two sources of surface water runoff associated with the proposed development.</p> <p>The following licensable discharges to sea are within the vicinity of Saltom Bay and have the potential to interact with the surface water runoff discharges from the Saltom Bay outfall associated with the proposed development (Chapter 17 , paragraph 17.34, of the Environmental Statement).</p> <p>A private sewer discharge outfall is located approximately 350 m from the proposed WCM discharge point and it is permitted to discharge no more than 0.2 m³ per day. The permit associated with this discharge states that the discharge must have no adverse visible effect on the receiving environment. Modelling shows that the private sewer discharge from a pharmacy in Kells (to Saltom Bay) is outside the zone of influence for the WCM discharge (Chapter 17 Marine Environment, paragraph 17.34.7, Environmental Statement, 2018). This is the case even when the outfall is fully exposed at low tide. Due to the separation distance and the very small volume of this discharge, a significant in-combination effect is not predicted to occur (Chapter 17 Marine Environment, paragraph 17.34.8, Environmental Statement, 2018).</p> <p>A United Utilities pumping station discharge (to Saltom Bay) is also outside the zone of influence for the WCM discharge (Chapter 17 Marine Environment, paragraph 17.34.7, Environmental Statement, 2018). The pumping station may only discharge to sea in emergency circumstances when the pumping station is inoperative. No discharge occurs under normal circumstances. Due to the operational restrictions on this outfall,</p>		

Solway Firth pSPA – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>a significant in-combination effect is not predicted (Chapter 17 Marine Environment, paragraph 17.34.9, Environmental Statement, 2018).</p> <p>The Sellafield outfalls extend ~2.1 km from shore into the north-eastern Irish Sea and are located approximately 14.5 km directly south of the Saltom Bay discharge point (~17 km by sea). The Sellafield discharge outfall (at Seascale) is therefore also outside the zone of influence for the WCM discharge (Chapter 17 Marine Environment, paragraph 17.34.7, Environmental Statement, 2018). An in-combination effect is not predicted to occur due to the separation distance (Chapter 17 Marine Environment, paragraph 17.34.11, Environmental Statement, 2018).</p> <p>The United Utilities wastewater treatment works discharge (at Parton, north of Whitehaven) is located approximately 5 km from the proposed discharge point in Saltom Bay. The discharge point of this outfall is therefore also outside the zone of influence for the WCM discharge (Chapter 17 Marine Environment, paragraph 17.34.7, Environmental Statement, 2018). Furthermore, the existing sewage discharge is discharged via diffuser(s) at a distance of ~1.9 km from shore, in the main current flows of the Solway Firth, and has an initial dilution factor of 50, which is generally considered appropriate for secondary treated sewage effluent. The United Utilities wastewater treatment works discharge is therefore considered to have sufficient initial and secondary mixing to ensure that it will not produce cumulative or in-combination impacts with the Saltom Bay discharge. (Chapter 17 Marine Environment, paragraph 17.34.10, Environmental Statement, 2018).</p> <p>There are no other projects which CCC is aware of in the marine environment in the proximity of the proposed mine that need to be included in an in-combination assessment. The NuGen Moorside</p>		

Solway Firth pSPA – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>development is currently on hold, and timescales, the nature and scope of the project, and its potential impacts are unknown. Therefore, no cumulative impact assessment is provided for this development.</p> <p>It is therefore concluded that the discharge will not have a significant effect on the marine environment, either alone or in combination with other discharges from other plans or projects (Chapter 17 Marine Environment, Environmental Statement, section 17.31.5, West Cumbria Mining, 2018).</p> <p>It is concluded that there will be no adverse effect on the integrity of the pSPA (through impacts on the populations of the pSPA qualifying species or through impacts on supporting habitats or species) through this pathway alone or in combination with other plans or projects.</p>		
4	Direct loss of or damage to marine habitat or disturbance to marine species from scouring and/or sedimentation from any discharges via Pow Beck	Potential effect on pSPA marine birds both within pSPA boundary and surrounding functional habitat through impacts on prey availability	<p>The proposed development will not impact directly on any part of the Solway Firth pSPA. Data collected through desk study complemented by survey data collected during various surveys carried out during the period 2015 to 2018 have led to the conclusion that no parts of the land at the development site provide supporting habitat for pSPA birds (BSG Ecology, 2018).</p> <p>Impacts on marine habitat or disturbance to marine species from scouring and/or sedimentation are, however, possible at the point where Pow Beck discharges to the sea to the south of St Bees (approximately 2.8 km downstream of the development), as a result of the discharge of surface water made to connected watercourses from the conveyor and RLF.</p> <p>Surface water flows, if uncontrolled, have the potential to entrain</p>	Yes	Yes

Solway Firth pSPA – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>sediments and contaminants generated by the operation of the proposed development, which may have negative impacts on marine water quality and marine biota. In addition, the flows themselves, if increased, will have the potential to cause scouring around the mouth of Pow Beck.</p> <p>In order to minimise potential scour, discharge and control measures will be adopted at the conveyor and rail loading facility sites (Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, sections 6.2 and 6.3, Flood Risk Assessment and Drainage Strategy, Environmental Statement, West Cumbria Mining, 2018; Sections 5.7 and 5.10 of the Draft Environmental Management Plan - Appendix E to Chapter 5 Project Description, Environmental Statement, West Cumbria Mining, 2018).</p> <p>Bellhouse Gill and an unnamed tributary of the Pow Beck (both ephemeral watercourses) are intersected by the conveyor route. The conveyor will be buried beneath these two ephemeral watercourses during the construction phase. Following construction, the flow regime at these locations will return to pre-development conditions. There will therefore be no increases in flow rates or discharge volumes to Pow Beck, and hence no impacts at St Bees beach due to scour are predicted (Chapter 17 Marine Environment, Environmental Statement, section 17.32.7, West Cumbria Mining, 2018).</p> <p>After construction the conveyor box will be backfilled with low permeability material in a way that will minimise ingress and tracking of surface water along the outside of the box structure. At this point the difference between the flow regimes pre and post construction is expected to be negligible (Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, Flood Risk Assessment and Drainage Strategy, section 6.2.1.2, Environmental Statement, West Cumbria Mining, 2018). This</p>		

Solway Firth pSPA – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>situation is expected to continue during the operational phase as the conveyor will be left in situ. During the operational phase, surface water runoff at the rail loading facility (RLF) site will be retained on-site in attenuation lagoons. Surface discharges to Pow Beck will be at a reduced rate compared to the current greenfield runoff rates. Whilst runoff volume will increase due to the increase in impermeable area, this excess volume will be discharged slowly after the peak flow has passed and will not increase flood flow rates in the Pow Beck.</p> <p>Consequently, impacts associated with scour at the mouth of the Pow Beck are therefore not predicted to occur (Chapter 17 Marine Environment, Environmental Statement, sections 17.32.7, West Cumbria Mining, 2018).</p> <p>It is concluded that there will be no adverse effect on the integrity of the pSPA (through impacts on the populations of the pSPA qualifying species or through impacts on supporting habitats or species) through this pathway alone or in combination with other plans or projects.</p> <p>In relation to the risk of scouring there is predicted to be no impact at the point where the Pow Beck discharges to the sea from WCM's project and so no risk of any in-combination impact.</p>		
5	Dust and other airborne contamination of marine and terrestrial habitats – MMS/RLF	Potential effect on pSPA marine birds both within pSPA boundary and surrounding functional habitat through Impacts on	<p>Please see paragraphs 6.144 et seq in Chapter 6, which provide a detailed assessment of the effects of dust.</p> <p>Please see paragraphs 6.148 et seq in Chapter 6, which provide a detailed assessment of the effects of NOx.</p>	Yes	Yes

Solway Firth pSPA – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
		prey availability	<p>Please see paragraphs 6.152 et seq in Chapter 6, which provide a detailed assessment of the effects of N deposition.</p> <p>It is important to note that the analysis of air quality impacts presented in the above sections represents, as is legally required, a cumulative assessment of the proposed development (i.e. in combination with other plans and projects). This covers dust, traffic, and other operational controlled emissions and is explained in detail in the air quality assessment (Chapter 15 Air Quality, section 15.7, paragraph 15.7.1 - 15.7.4 [dust], paragraph 15.7.5 – 15.7.10 [traffic], paragraph 15.7.11 – 15.7.12 [controlled emissions], Environmental Statement, 2018)).</p>		
6	Deterioration of marine water quality as a result of sediment-laden surface water run-off via Saltom Bay outfall	<p>Possible effect on pSPA marine birds within pSPA boundary and functional habitat through Impacts on prey availability through:</p> <p>Escape of sediment-entrained surface water</p>	<p>The proposed development will not impact directly on any part of the Solway Firth pSPA; however, impacts on marine water quality are possible as a result of discharges of surface water made through the existing sea outfall pipe.</p> <p>Data collected through desk study complemented by survey data collected during various surveys carried out during the period 2015 to 2018 have led to the conclusion that no parts of the land at the development site provide supporting habitat for pSPA birds (BSG Ecology, 2018).</p> <p>In the absence of mitigation measures, the release of sediment-laden surface water into the marine environment could potentially impact on pSPA qualifying features directly (if they are present in the vicinity of the discharge pipe), for example as a result of habitat deterioration due to sediment laden water, or indirectly, by impacting on the prey species or habitats that pSPA qualifying features depend upon.</p>	Yes	Yes

Solway Firth pSPA – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>However, the effects of suspended solids on the marine environment will be fully mitigated during the operational phase. During the operation phase of the development, surface water within the site will be collected and stored. The mining activities are water consumptive and so it is expected that most surface water will be utilised on site (Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, Flood Risk Assessment and Drainage Strategy, Section 6.1.4.3, Environmental Statement, West Cumbria Mining, 2018).</p> <p>All surface water arising from areas of hard-standing and roofs of buildings will be captured, attenuated on site and used in the coal processing plant and as a source of grey water (for example for toilet flushing etc) (Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, Flood Risk Assessment and Drainage Strategy, Section 6.1.4.3, Environmental Statement, West Cumbria Mining, 2018; Sections 5.7 and 5.10 of the Draft Environmental Management Plan - Appendix E to Chapter 5 Project Description, Environmental Statement, West Cumbria Mining, 2018).</p> <p>Storm water flows will be accommodated in the storm water attenuation tank on site (total capacity 6,500m³) (Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, Flood Risk Assessment and Drainage Strategy, Section 6.1.4.3, Environmental Statement, West Cumbria Mining, 2018). Where possible, these flows will be used in the coal processing and associated plant, however in exceptional circumstances a storm water discharge may be required. Storm water flows will go to sea via the existing discharge point, and they will first be passed through silt traps and oil interceptors (although it should be noted that during the operational phase silt mobilisation will be limited once the bund vegetation is established, and no oils will be stored outside). All</p>		

Solway Firth pSPA – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>pollutants (including sediments) will be controlled through the adoption of best practice measures (Draft Environmental Management Plan - Appendix E to Chapter 5 Project Description, Sections 5.7 and 5.10, Environmental Statement, West Cumbria Mining, 2018). The discharge will be at a maximum flow rate of 25 l/s (Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, Flood Risk Assessment and Drainage Strategy, section 6.1.4.2 et seq, Environmental Statement, West Cumbria Mining, 2018). The attenuation measures described above will ensure that the maximum permitted flow rate of 25 l/s is not exceeded.</p> <p>Discharged surface water will necessarily have to achieve the environmental permit standard that will be set by the consenting authority (Chapter 5, Environmental Statement, Appendix E, Section 6, West Cumbria Mining, 2018; Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, Flood Risk Assessment and Drainage Strategy, section 6.1.4.3, Environmental Statement, West Cumbria Mining, 2018). A Marine Environmental Monitoring Plan will be implemented to assess the potential impacts of the discharge (Chapter 17 Marine Environment, Appendix C, paragraph 4.12, Environmental Statement, West Cumbria Mining, 2018).</p> <p>Modelling work has concluded that the Zone of Influence of the discharge into the sea, when combined with the existing leachate discharge, is 162m from the outfall, which means that the Solway Firth pSPA and its qualifying features will not be directly impacted (Chapter 17 Marine Environment, Environmental Statement, section 17.34.7 et seq, West Cumbria Mining, 2018). Furthermore, as the proposed discharge is not expected to have a significant effect on marine fauna, no indirect impacts on pSPA qualifying features are expected either, e.g. as a result of impacts on prey species.</p>		

Solway Firth pSPA – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>The proposed mitigation measures and the maximum discharge rate (together with rapid mixing and dispersal in the marine environment) will ensure that the effects of the discharge are limited in their extent. No significant effects are likely on the marine environment (Chapter 17 Marine Environment, paragraph 17.31.6, Environmental Statement, West Cumbria Mining, 2018); indeed any such impact is regarded as negligible. Consequently it is not expected that the discharge of sediment laden surface water will impact directly or indirectly on the pSPA's population of qualifying features or their supporting habitats or species.</p> <p>The hydrological assessment has concluded that, with respect to groundwater and surface water, no pathway is considered to exist between the proposed development and any other proposed development (Chapter 12 Hydrology & Hydrogeology, Section 12.8, Environmental Statement, West Cumbria Mining, 2018).</p> <p>As such, an in-combination effect with other plans or projects is considered very unlikely, however, to ensure a comprehensive assessment, other discharges from other plans and projects have also been considered (if they include a proposed discharge to sea which could combine with the 162m zone of influence from the Saltom Bay outfall - Chapter 17 Marine Environment, Environmental Statement, section 17.34.1 et seq, West Cumbria Mining, 2018) and do not affect this conclusion.</p> <p>The zone of influence (ZOI) of the proposed surface water runoff discharge to Saltom Bay has been calculated as approximately 162 m and is over 8 km (by sea) from the mouth of Pow Beck. Hence no in-combination effect is predicted between the two sources of surface water</p>		

Solway Firth pSPA – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>runoff associated with the proposed development. The following licensable discharges to sea are within the vicinity of Saltom Bay and have the potential to interact with the surface water runoff discharges from the Saltom Bay outfall associated with the proposed development (Chapter 17 , paragraph 17.34, of the Environmental Statement):</p> <p>A private sewer discharge outfall is located approximately 350 m from the proposed WCM discharge point and it is permitted to discharge no more than 0.2 m³ per day. The permit associated with this discharge states that the discharge must have no adverse visible effect on the receiving environment. Modelling shows that the private sewer discharge from a pharmacy in Kells (to Saltom Bay) is outside the zone of influence for the WCM discharge (Chapter 17 Marine Environment, paragraph 17.34.7, Environmental Statement, 2018). This is the case even when the outfall is fully exposed at low tide. Due to the separation distance and the very small volume of this discharge, a significant in-combination effect is not predicted to occur (Chapter 17 Marine Environment, paragraph 17.34.8, Environmental Statement, 2018).</p> <p>A United Utilities pumping station discharge (to Saltom Bay) is also outside the zone of influence for the WCM discharge (Chapter 17 Marine Environment, paragraph 17.34.7, Environmental Statement, 2018). The pumping station may only discharge to sea in emergency circumstances when the pumping station is inoperative. No discharge occurs under normal circumstances. Due to the operational restrictions on this outfall, a significant in-combination effect is not predicted (Chapter 17 Marine Environment, paragraph 17.34.9, Environmental Statement, 2018).</p> <p>The Sellafield outfalls extend ~2.1 km from shore into the north-eastern Irish Sea and are located approximately 14.5 km directly south of the</p>		

Solway Firth pSPA – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>Saltom Bay discharge point (~17 km by sea). The Sellafield discharge outfall (at Seascale) is therefore also outside the zone of influence for the WCM discharge (Chapter 17 Marine Environment, paragraph 17.34.7, Environmental Statement, 2018). An in-combination effect is not predicted to occur due to the separation distance (Chapter 17 Marine Environment, paragraph 17.34.11, Environmental Statement, 2018).</p> <p>The United Utilities wastewater treatment works discharge (at Parton, north of Whitehaven) is located approximately 5 km from the proposed discharge point in Saltom Bay. The discharge point of this outfall is therefore also outside the zone of influence for the WCM discharge (Chapter 17 Marine Environment, paragraph 17.34.7, Environmental Statement, 2018). Furthermore, the existing sewage discharge is discharged via diffuser(s) at a distance of ~1.9 km from shore, in the main current flows of the Solway Firth, and has an initial dilution factor of 50, which is generally considered appropriate for secondary treated sewage effluent. The United Utilities wastewater treatment works discharge is therefore considered to have sufficient initial and secondary mixing to ensure that it will not produce cumulative or in-combination impacts with the Saltom Bay discharge. (Chapter 17 Marine Environment, paragraph 17.34.10, Environmental Statement, 2018).</p> <p>There are no other projects which CCC is aware of in the marine environment in the proximity of the proposed mine that need to be included in an in-combination assessment. The NuGen Moorside development is currently on hold, and timescales, the nature and scope of the project, and its potential impacts are unknown. Therefore, no cumulative impact assessment is provided for this development.</p> <p>It is concluded that there will be no adverse effect on the integrity of the pSPA (through impacts on the populations of the pSPA qualifying</p>		

Solway Firth pSPA – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			species or through impacts on supporting habitats or species) through this pathway alone or in combination with other plans or projects.		
7	Deterioration of marine water quality as a result of mobilisation of pollutants (including changes in pH, temperature, salinity, and dissolved oxygen) in surface water discharged via Saltom Bay outfall	<p>Potential effect on pSPA marine birds within pSPA boundary and adjacent functional habitat including impacts on prey availability through:</p> <p>Mobilisation of underground contaminants disturbed</p> <p>Potential for pollution incidents from spillages, leakages etc from stored chemicals, fuel and oils on site.</p>	<p>The proposed development will not impact directly on any part of the Solway Firth pSPA; however, impacts on marine water quality are possible as a result of discharges of surface water made through the existing sea outfall pipe.</p> <p>Data collected through desk study complemented by survey data collected during various surveys carried out during the period 2015 to 2018 have led to the conclusion that no parts of the development site provide supporting habitat for pSPA birds (BSG Ecology, 2018).</p> <p>In the absence of mitigation measures, the release of pollutants into the marine environment could potentially impact on pSPA qualifying features directly (if they are present in the vicinity of the discharge pipe), for example as a result of toxic effects, or indirectly, by impacting on the prey species that pSPA qualifying features depend upon. There are also potential impacts associated with the discharge and these are related to non-toxic inputs. These include the effects of pH, temperature, salinity and dissolved oxygen.</p> <p>However, the effects of pollutants on the marine environment will be fully mitigated during the operational phase. During the operation phase of the development surface water within the site will be collected and stored. The mining activities are water consumptive and so it is expected that most surface water will be utilised on site (Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, Flood Risk Assessment and Drainage Strategy, Section 6.1.4.3, Environmental Statement, West Cumbria Mining, 2018).</p>	Yes	Yes

Solway Firth pSPA – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>All surface water arising from areas of hard-standing and roofs of buildings will be captured, attenuated on site and used in the coal processing plant and as a source of grey water (for example for toilet flushing etc) (Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, Flood Risk Assessment and Drainage Strategy, Section 6.1.4.3, Environmental Statement, West Cumbria Mining, 2018; Sections 5.7 and 5.10 of the Draft Environmental Management Plan - Appendix E to Chapter 5 Project Description, Environmental Statement, West Cumbria Mining, 2018).</p> <p>Storm water flows will be accommodated in the storm water attenuation tank on site (total capacity 6,500m³) (Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, Flood Risk Assessment and Drainage Strategy, Section 6.1.4.3, Environmental Statement, West Cumbria Mining, 2018). Where possible, these flows will be used in the coal processing and associated plant, however in exceptional circumstances a storm water discharge may be required. Storm water flows will go to sea via the existing discharge point, and they will first be passed through silt traps and oil interceptors (although it should be noted that during the operational phase silt mobilisation will be limited once the bund vegetation is established, and no oils will be stored outside).</p> <p>The discharge will be at a maximum flow rate of 25 l/s (Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, Flood Risk Assessment and Drainage Strategy, section 6.1.4.2 et seq, Environmental Statement, West Cumbria Mining, 2018). The attenuation measures described above will ensure that the maximum permitted flow rate of 25 l/s is not exceeded.</p> <p>Discharged surface water will necessarily have to achieve the environmental permit standard that will be set by the consenting authority</p>		

Solway Firth pSPA – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>(Chapter 5, Environmental Statement, Appendix E, Section 6, West Cumbria Mining, 2018; Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, Flood Risk Assessment and Drainage Strategy, section 6.1.4.3, Environmental Statement, West Cumbria Mining, 2018). All other pollutants will be controlled through the adoption of best practice measures (Draft Environmental Management Plan - Appendix E to Chapter 5 Project Description, Sections 5.7 and 5.10, Environmental Statement, West Cumbria Mining, 2018). A Marine Environmental Monitoring Plan will be implemented to assess the potential impacts of the discharge (Chapter 17 Marine Environment, Appendix C, paragraph 4.12, Environmental Statement, West Cumbria Mining, 2018).</p> <p>The marine assessment has concluded that the proposed discharge of surface water into the marine environment is not expected to have an effect on pH, salinity, water temperature of dissolved oxygen (Chapter 17 Marine Environment, Environmental Statement, West Cumbria Mining, 2018, paragraphs 17.31.7 [pH], 17.31.9-12 [salinity], 17.31.8 [water temperature], 17.31.13-14 [dissolved oxygen]).</p> <p>Modelling work has concluded that the Zone of Influence of the discharge into the sea, when combined with the existing leachate discharge, is 162m from the outfall, which means that the Solway Firth pSPA and its qualifying features will not be directly impacted (Chapter 17 Marine Environment, Environmental Statement, section 17.34.7 et seq, West Cumbria Mining, 2018). Furthermore, as the proposed discharge is not expected to have a significant effect on marine fauna, no indirect impacts on pSPA qualifying features are expected either, e.g. as a result of impacts on prey species.</p> <p>The proposed mitigation measures and the maximum discharge rate</p>		

Solway Firth pSPA – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>(together with rapid mixing and dispersal in the marine environment) will ensure that the effects of the discharge are limited in their extent. No significant effects are likely on the marine environment (Chapter 17 Marine Environment, paragraph 17.31.6 et seq, Environmental Statement, West Cumbria Mining, 2018), indeed any such impact is regarded as negligible.</p> <p>Consequently it is not expected that the discharge of pollutants (including changes in pH, temperature, salinity, and dissolved oxygen) will impact directly or indirectly on pSPA populations of qualifying features or their supporting habitats or species.</p> <p>The hydrological assessment has concluded that, with respect to groundwater and surface water, no pathway is considered to exist between the proposed development and any other proposed development (Chapter 12 Hydrology & Hydrogeology, Section 12.8, Environmental Statement, West Cumbria Mining, 2018). As such, an in-combination effect with other plans or projects is considered very unlikely, however, to ensure a comprehensive assessment, other discharges from other plans and projects have also been considered (if they include a proposed discharge to sea which could combine with the 162m zone of influence from the Saltom Bay outfall - Chapter 17 Marine Environment, Environmental Statement, section 17.34.1 et seq, West Cumbria Mining, 2018).</p> <p>The zone of influence (ZOI) of the proposed surface water runoff discharge to Saltom Bay has been calculated as approximately 162 m and is over 8 km (by sea) from the mouth of Pow Beck. Hence no in-combination effect is predicted between the two sources of surface water runoff associated with the proposed development. The following</p>		

Solway Firth pSPA – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>licensable discharges to sea are within the vicinity of Saltom Bay and have the potential to interact with the surface water runoff discharges from the Saltom Bay outfall associated with the proposed development (Chapter 17 , paragraph 17.34, of the Environmental Statement):</p> <p>A private sewer discharge outfall is located approximately 350 m from the proposed WCM discharge point and it is permitted to discharge no more than 0.2 m³ per day. The permit associated with this discharge states that the discharge must have no adverse visible effect on the receiving environment. Modelling shows that the private sewer discharge from a pharmacy in Kells (to Saltom Bay) is outside the zone of influence for the WCM discharge (Chapter 17 Marine Environment, paragraph 17.34.7, Environmental Statement, 2018). This is the case even when the outfall is fully exposed at low tide. Due to the separation distance and the very small volume of this discharge, a significant in-combination effect is not predicted to occur (Chapter 17 Marine Environment, paragraph 17.34.8, Environmental Statement, 2018).</p> <p>A United Utilities pumping station discharge (to Saltom Bay) is also outside the zone of influence for the WCM discharge (Chapter 17 Marine Environment, paragraph 17.34.7, Environmental Statement, 2018). The pumping station may only discharge to sea in emergency circumstances when the pumping station is inoperative. No discharge occurs under normal circumstances. Due to the operational restrictions on this outfall, a significant in-combination effect is not predicted (Chapter 17 Marine Environment, paragraph 17.34.9, Environmental Statement, 2018).</p> <p>The Sellafeld outfalls extend ~2.1 km from shore into the north-eastern Irish Sea and are located approximately 14.5 km directly south of the Saltom Bay discharge point (~17 km by sea). The Sellafeld discharge</p>		

Solway Firth pSPA – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>outfall (at Seascale) is therefore also outside the zone of influence for the WCM discharge (Chapter 17 Marine Environment, paragraph 17.34.7, Environmental Statement, 2018). An in-combination effect is not predicted to occur due to the separation distance (Chapter 17 Marine Environment, paragraph 17.34.11, Environmental Statement, 2018).</p> <p>The United Utilities wastewater treatment works discharge (at Parton, north of Whitehaven) is located approximately 5 km from the proposed discharge point in Saltom Bay. The discharge point of this outfall is therefore also outside the zone of influence for the WCM discharge (Chapter 17 Marine Environment, paragraph 17.34.7, Environmental Statement, 2018). Furthermore, the existing sewage discharge is discharged via diffuser(s) at a distance of ~1.9 km from shore, in the main current flows of the Solway Firth, and has an initial dilution factor of 50, which is generally considered appropriate for secondary treated sewage effluent. The United Utilities wastewater treatment works discharge is therefore considered to have sufficient initial and secondary mixing to ensure that it will not produce cumulative or in-combination impacts with the Saltom Bay discharge. (Chapter 17 Marine Environment, paragraph 17.34.10, Environmental Statement, 2018).</p> <p>There are no other projects which CCC is aware of in the marine environment in the proximity of the proposed mine that need to be included in an in-combination assessment. The NuGen Moorside development is currently on hold, and timescales, the nature and scope of the project, and its potential impacts are unknown. Therefore, no cumulative impact assessment is provided for this development. .</p> <p>It is concluded that there will be no adverse effect on the integrity of the pSPA (through impacts on the populations of the pSPA qualifying species or through impacts on supporting habitats or species) through</p>		

Solway Firth pSPA – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			this pathway alone or in combination with other plans or projects.		
8	Deterioration of marine water quality as a result of sediment and other pollutant-laden surface water run-off during operation, via Pow Beck catchment	Potential effect on pSPA marine birds within pSPA boundary and adjacent functional habitat including impacts on prey availability through surface water discharge and run-off	<p>The proposed development will not impact directly on any part of the Solway Firth pSPA; however, impacts on marine water quality are possible as a result of discharges of surface water made from the RLF and Conveyor to the Bellhouse Gill and Pow Beck, which eventually discharges to the sea to the south of St Bees approximately 2.8 km downstream of the development.</p> <p>Data collected through desk study complemented by survey data collected during various surveys carried out during the period 2015 to 2018 have led to the conclusion that no parts of the land at the development site provide supporting habitat for pSPA birds (BSG Ecology, 2018).</p> <p>In the absence of mitigation the release of sediment-laden surface water via the Pow Beck into the marine environment could potentially impact on pSPA qualifying features directly (if they are present in the vicinity of the Pow Beck where it discharges to sea at St Bees Beach), for example as a result of habitat deterioration due to sediment-laden water, or indirectly, by impacting on the prey species that pSPA qualifying features depend upon.</p> <p>The effects of suspended solids (transported via the Pow Beck) on the marine environment will be fully mitigated through measures that will be adopted during the operational phase of the development.</p> <p>Surface discharges to Pow Beck will be at a reduced rate compared to the current greenfield runoff rates. Whilst runoff volume will increase due to the increase in impermeable area, this excess volume will be</p>	Yes	Yes

Solway Firth pSPA – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>discharged slowly after the peak flow has passed and will not increase flood flow rates in the Pow Beck.</p> <p>During the operation phase of the development surface water within the site will be collected and stored. The mining activities are water consumptive and so it is expected that most surface water will be utilised on site (Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, Flood Risk Assessment and Drainage Strategy, Section 6.1.4.3, Environmental Statement, West Cumbria Mining, 2018).</p> <p>All other pollution effects will be fully mitigated through the adoption of best practice pollution prevention measures at the conveyor site and RLF. (Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, Flood Risk Assessment and Drainage Strategy, Sections 6.2 and 6.3, Environmental Statement, West Cumbria Mining, 2018 and Draft Environmental Management Plan - Appendix E to Chapter 5 Project Description, Sections 5.7 and 5.10, Environmental Statement, West Cumbria Mining, 2018).</p> <p>Dilution effects within Bellhouse Gill and Pow Beck will also reduce the environmental concentrations of any contaminants present (though this is considered unlikely once good practice measures are in place) to the point where they are not predicted to have any significant impact on the marine environment (Chapter 17 Marine Environment, paragraph 17.29.21 – 17.29.23, Environmental Statement, West Cumbria Mining, 2018).</p> <p>These good practice measures, in conjunction with mixing and dilution effects of the freshwater watercourses, mean that no significant pollution impact on the marine environment is predicted via the Pow Beck pathway</p>		

Solway Firth pSPA – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>(see Chapter 17, Marine Environment, paragraph 17.29.22, Environmental Statement, 2018), indeed any such impact is regarded as negligible. Consequently it is not expected that the discharge to Pow Beck will impact directly or indirectly on pSPA populations of qualifying features or their supporting habitats or species.</p> <p>The hydrological assessment has concluded that, with respect to groundwater and surface water, no pathway is considered to exist between the proposed development and any other proposed development (Chapter 12 Hydrology & Hydrogeology, Section 12.8, Environmental Statement, West Cumbria Mining, 2018).</p> <p>As such an in-combination effect with other plans or projects is considered very unlikely, however, to ensure a comprehensive assessment, nearby licensable discharges to sea in the vicinity of the mouth of Pow Beck have nevertheless been investigated.</p> <p>The zone of influence (ZOI) of the proposed surface water runoff discharge to Saltom Bay has been calculated as approximately 162 m and is over 8 km (by sea) from the mouth of Pow Beck. Hence no in-combination effect is predicted between the two sources of surface water runoff associated with the proposed development.</p> <p>The closest licensed discharge to the mouth of Pow Beck is a United Utilities pumping station located at Nethertown, which has a permit to discharge to sea (permit no. 017470153) approximately 4 km south of the mouth of Pow Beck. However, under the conditions of the permit, the pumping station may only discharge to sea in emergency circumstances when the pumping station is inoperative as a result of e.g. electrical failure or rising main failure. No discharge occurs under normal</p>		

Solway Firth pSPA – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>circumstances. For this reason this discharge has been scoped out of the in-combination impact assessment.</p> <p>The United Utilities WwTW located at Braystones, south of Nethertown, discharges to sea via a long sea outfall (permit no. 017470152). The discharge point of this outfall is located approximately 7 km south from the mouth of Pow Beck and hence any combined effect between it and any discharges made via Pow Beck is very unlikely. Furthermore, the existing sewage discharge is discharged via diffuser(s) at a distance of ~2 km from shore and has an initial dilution factor generally considered appropriate for secondary treated sewage effluent. The existing discharge is therefore considered to have sufficient initial and secondary mixing to ensure that it will not produce cumulative or in-combination impacts with other discharges.</p> <p>The Sellafeld outfalls extend ~2.1 km from shore into the north-eastern Irish Sea and are located approximately 8.8 km from the mouth of Pow Beck and hence, again, it is considered highly unlikely that the two plumes will interact. Furthermore, the two discharges are not similar; the proposed discharges to Pow Beck are ambient temperature freshwater which, with good practice guidelines in place, will not be contaminated, while the Sellafeld discharge is a cooling water discharge, i.e. warm seawater. There is therefore no realistic likelihood of in-combination effects between the two discharges.</p> <p>There are no other projects which CCC is aware of in the marine environment in the proximity of the proposed mine that need to be included in an in-combination assessment. The NuGen Moorside development is currently on hold, and timescales, the nature and scope of the project, and its potential impacts are unknown. Therefore, no</p>		

Solway Firth pSPA – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>cumulative impact assessment is provided for this development.</p> <p>It is concluded that there will be no adverse effect on the integrity of the pSPA (through impacts on the populations of the pSPA qualifying species or through impacts on supporting habitats or species) through this pathway alone or in combination with other plans or projects.</p>		
9	Deterioration of marine water quality as a result of disturbance of contaminated land and mobilisation of pollutants (including changes in pH, temperature, salinity, and dissolved oxygen) discharged via Pow Beck catchment	<p>Potential effect on pSPA marine birds within pSPA boundary and adjacent functional habitat including impacts on prey availability through:</p> <p>Mobilisation of underground contaminants disturbed</p> <p>Potential for pollution incidents from spillages, leakages etc from stored chemicals, fuel and oils on site.</p>	<p>The proposed development will not impact directly on any part of the Solway Firth pSPA; however, impacts on marine water quality are possible as a result of discharges of surface water made from the RLF and Conveyor to the Bellhouse Gill and Pow Beck, which eventually discharges to the sea to the south of St Bees approximately 2.8 km downstream of the development.</p> <p>In the absence of mitigation the release of pollutants into the marine environment could potentially impact on SPA qualifying features directly (if they are present in the vicinity of the Pow Beck where it discharges to sea), for example as a result of toxic effects, or indirectly, by impacting on the prey species that SPA qualifying features depend upon. There are also potential impacts associated with the discharge related to non-toxic inputs. These include the effects of pH, temperature, salinity and dissolved oxygen.</p> <p>Prior to the main construction period it is planned that a 6 month remediation phase will be required to treat pockets of contamination which may remain in areas of the site. Consequently no contamination will remain in areas that could be impacted during the operational phase of the development, and so no pathway exists for the mobilisation of contaminants (Chapter 17 Marine Environment, Environmental Statement, West Cumbria Mining, 2018, paragraph 19.29.7).</p>	Yes	Yes

Solway Firth pSPA – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>Bellhouse Gill and an unnamed tributary of the Pow Beck (both ephemeral watercourses) are intersected by the conveyor route. The conveyor will be buried beneath these ephemeral watercourses; following construction, the flow regime at these locations will return to pre-development conditions. There will therefore be no increases in flow rates or discharge volumes to Pow Beck (Chapter 17 Marine Environment, Environmental Statement, section 17.32.7, West Cumbria Mining, 2018). The conveyor route is enclosed, which will minimise the chance of contamination of local watercourses.</p> <p>Water discharge and pollution controls will be adopted at the conveyor site and RLF, which will minimise pollutant release to Pow Beck and hence the marine environment. (Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, sections 6.2 and 6.3, Flood Risk Assessment and Drainage Strategy, Environmental Statement, West Cumbria Mining, 2018; Sections 5.7 and 5.10 of the Draft Environmental Management Plan - Appendix E to Chapter 5 Project Description, Environmental Statement, West Cumbria Mining, 2018).</p> <p>During the operational phase, surface water runoff at the rail loading facility (RLF) site will be retained on-site in attenuation lagoons. Surface discharges to Pow Beck will be at a reduced rate compared to the current greenfield runoff rates. Whilst runoff volume will increase due to the increase in impermeable area, this excess volume will be discharged slowly after the peak flow has passed and will not increase flood flow rates in the Pow Beck. As with both the Marchon and the conveyor construction sites, water pollution controls, including the use of attenuation lagoons, will be implemented to minimise sediment and</p>		

Solway Firth pSPA – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>pollutant release to freshwater watercourses and hence the marine environment.</p> <p>Dilution effects within Bellhouse Gill and Pow Beck will also reduce the environmental concentrations of any contaminants present (though this is considered unlikely once good practice measures are in place) to the point where they are not predicted to have any significant impact on the marine environment (Chapter 17 Marine Environment, paragraph 17.29.21 – 17.29.23, Environmental Statement, West Cumbria Mining, 2018). The adoption of good practice measures, in conjunction with mixing and dilution effects of the freshwater watercourses (the Pow Beck discharges to sea 2.8 km downstream of the development site), mean that no significant pollution impact on the marine environment is predicted via the Pow Beck pathway (see Chapter 17, Marine Environment, paragraph 17.29.22, Environmental Statement, 2018), indeed any such impact is regarded as negligible.</p> <p>Consequently it not expected that the discharge of pollutants to Pow Beck (including changes in pH, temperature, salinity, and dissolved oxygen) will impact directly or indirectly on pSPA populations of qualifying features or their supporting habitats or species.</p> <p>The hydrological assessment has concluded that, with respect to groundwater and surface water, no pathway is considered to exist between the proposed development and any other proposed development (Chapter 12 Hydrology & Hydrogeology, Section 12.8, Environmental Statement, West Cumbria Mining, 2018).</p>		

Solway Firth pSPA – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>As such an in-combination effect with other plans or projects is considered very unlikely, however, to ensure a comprehensive assessment, nearby licensable discharges to sea in the vicinity of the mouth of Pow Beck have nevertheless been investigated.</p> <p>The zone of influence (ZOI) of the proposed surface water runoff discharge to Saltom Bay has been calculated as approximately 162 m and is over 8 km (by sea) from the mouth of Pow Beck. Hence no in-combination effect is predicted between the two sources of surface water runoff associated with the proposed development.</p> <p>The closest licensed discharge to the mouth of Pow Beck is a United Utilities pumping station located at Nethertown, which has a permit to discharge to sea (permit no. 017470153) approximately 4 km south of the mouth of Pow Beck. However, under the conditions of the permit, the pumping station may only discharge to sea in emergency circumstances when the pumping station is inoperative as a result of e.g. electrical failure or rising main failure. No discharge occurs under normal circumstances. For this reason this discharge has been scoped out of the in-combination impact assessment.</p> <p>The United Utilities WWTW located at Braystones, south of Nethertown, discharges to sea via a long sea outfall (permit no. 017470152). The discharge point of this outfall is located approximately 7 km south from the mouth of Pow Beck and hence any combined effect between it and any discharges made via Pow Beck is very unlikely. Furthermore, the existing sewage discharge is discharged via diffuser(s) at a distance of ~2 km from shore and has an initial dilution factor generally considered appropriate for secondary treated sewage effluent. The existing</p>		

Solway Firth pSPA – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>discharge is therefore considered to have sufficient initial and secondary mixing to ensure that it will not produce cumulative or in-combination impacts with other discharges.</p> <p>The Sellafield outfalls extend ~2.1 km from shore into the north-eastern Irish Sea and are located approximately 8.8 km from the mouth of Pow Beck and hence, again, it is considered highly unlikely that the two plumes will interact. Furthermore, the two discharges are not similar; the proposed discharges to Pow Beck are ambient temperature freshwater which, with good practice guidelines in place, will not be contaminated, while the Sellafield discharge is a cooling water discharge, i.e. warm seawater. There is therefore no realistic likelihood of in-combination effects between the two discharges.</p> <p>There are no other projects which CCC is aware of in the marine environment in the proximity of the proposed mine that need to be included in an in-combination assessment. The NuGen Moorside development is currently on hold, and timescales, the nature and scope of the project, and its potential impacts are unknown. Therefore, no cumulative impact assessment is provided for this development.</p> <p>It is concluded that there will be no adverse effect on the integrity of the pSPA (through impacts on the populations of the pSPA qualifying species or through impacts on supporting habitats or species) through this pathway alone or in combination with other plans or projects.</p>		
10	Subsidence effects under	Subsidence under the terrestrial	In the absence of mitigation, it is possible that subsidence (and any associated seismic events induced by subsidence) arising from mining	Yes	Yes

Solway Firth pSPA – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
	the terrestrial environment	environment as a result of sub-surface mining activities	<p>related activities may impact on the pSPA qualifying species and the supporting habitats and species on which they depend, as a result of changes in sediment deposition.</p> <p>For the areas of onshore mining, the proposed partial extraction mining technique in combination with the use of paste backfill in mined areas may result in, as a worst case scenario, very low levels of subsidence under the terrestrial habitats (65% void back-filling is proposed). If subsidence does occur it will happen gradually.</p> <p>The proposed mining method under the terrestrial environment involves the backfilling of voids with waste material. The paste backfill involves waste rock being converted into a paste type material, which will consist of ground up rock, a cementitious additive and water. This will be pumped into the underground areas that have been mined. The deposited material, once hardened, provides additional stability underground (Briefing Note, Paste Plant Process, Appendix D to Chapter 5 Project Description, Environmental Statement, West Cumbria Mining, 2018).</p> <p>It is expected that the paste would fill 65% of the void space created by mining in the panels where paste backfill is employed (Appendix B to Chapter 5 Project Description, Environmental Statement, West Cumbria Mining, 2018). It is therefore planned, in the event that the amount of waste is limited, to prioritise the paste backfill to areas that will be most sensitive to subsidence, such as the terrestrial areas (Appendix D to Chapter 5 Project Description, Environmental Statement, West Cumbria Mining, 2018).</p> <p>The maximum predicted subsidence arising from areas of multiple panel</p>		

Solway Firth pSPA – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>mining is 30 cm in the absence of paste backfill, which reduces to less than 15 cm when the same excavation is backfilled by 65% with paste. The maximum rate at which the subsidence will take place over the centre of a panel is 0.6 cm per day without paste backfill and less than 0.3 cm per day with paste backfill over a two-week period when the face of the panel is directly underneath (Appendix D to Chapter 5 Project Description, Environmental Statement, West Cumbria Mining, 2018). Subsidence, if it happens, will only occur during the operation phase of the development (if a drift collapses this is not predicted to result in subsidence at the surface): Appendix B, Section 3.3, Subsidence Briefing Note, Chapter 5 Project Description, Environmental Statement, West Cumbria Mining, 2018).</p> <p>Overall it is concluded that, whilst subsidence (and therefore associated seismic events induced by subsidence) may occur below onshore terrestrial habitat, such subsidence will be of limited magnitude and will be slow to develop. Consequently it is not expected that subsidence will impact directly or indirectly on the pSPA's population of qualifying species or the supporting species or habitats on which they depend.</p> <p>As no impact through subsidence is predicted onshore, it follows that no significant impact through induced seismicity (i.e. seismicity associated with and induced by subsidence) is expected. As no impact is predicted on the pSPA's qualifying features via this pathway, there is no effect with which the effect of any other plan or project can combine. In any event, there are no other plans or projects known with subsidence impacts which could act in combination with the predicted subsidence from the WCM project and as such no scope of any in-combination impact via this pathway. It is concluded that there will be no adverse effect on the integrity of the pSPA (through impacts on the populations of the pSPA</p>		

Solway Firth pSPA – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			qualifying species or through impacts on supporting habitats or species) through this pathway alone or in combination with other plans or projects.		
11	Subsidence effects under the marine environment	Subsidence under the marine environment as a result of sub-surface mining activities	<p>In the absence of mitigation, it is possible that subsidence (and any associated seismic events induced by subsidence) arising from mining related activities may impact on the pSPA qualifying species and the supporting habitats and species on which they depend, as a result of changes in changes in marine water and habitat quality that may impact on qualifying species (and the habitats and prey species which support them).</p> <p>For the areas of offshore mining, the proposed partial extraction mining technique in combination with the use of paste backfill in mined areas may result in, as a worst case scenario, very low levels of subsidence under the marine habitats. If subsidence does occur it will happen gradually.</p> <p>The proposed mining method under the marine environment (note that there is no coal extraction under St Bees Head SSSI and the MCZ) involves the backfilling of some voids with waste material. The paste backfill involves waste rock being converted into a paste type material, which will consist of ground up rock, a cementitious additive and water. This will be pumped into the underground areas that have been mined. The deposited material, once hardened, provides additional stability underground (Briefing Note, Paste Plant Process, Appendix D to Chapter 5 Project Description, Environmental Statement, West Cumbria Mining, 2018).</p> <p>It is expected that the paste would fill 65% of the void space created by mining in the panels where paste backfill is employed (Appendix B to</p>	Yes	Yes

Solway Firth pSPA – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>Chapter 5 Project Description, Environmental Statement, West Cumbria Mining, 2018). It is therefore planned, in the event that the amount of waste is limited, to prioritise the paste backfill to areas that will be most sensitive to subsidence, such as the terrestrial areas (Appendix D to Chapter 5 Project Description, Environmental Statement, West Cumbria Mining, 2018).</p> <p>The maximum predicted subsidence arising from areas of multiple panel mining is 30 cm in the absence of paste backfill, which reduces to less than 15 cm when the same excavation is backfilled by 65% with paste. The maximum rate at which the subsidence will take place over the centre of a panel is 0.6 cm per day without paste backfill and less than 0.3 cm per day with paste backfill over a two-week period when the face of the panel is directly underneath (Appendix D to Chapter 5 Project Description, Environmental Statement, West Cumbria Mining, 2018). Subsidence, if it happens, will only occur during the operation phase of the development (if a drift collapses this is not predicted to result in subsidence at the surface): Appendix B, Section 3.3, Subsidence Briefing Note, Chapter 5 Project Description, Environmental Statement, West Cumbria Mining, 2018).</p> <p>For the areas of offshore mining, as a result of the proposed partial extraction method and the use of paste backfill (as detailed above), approximately 10% of the offshore mining area may experience subsidence up to 15 cm, and approximately 50% may experience subsidence of up to 7.5 cm (Appendix B, Subsidence Briefing Note, Chapter 5 Project Description, Environmental Statement, West Cumbria Mining, 2018). As noted above, subsidence, if it occurs, will be slow to develop.</p>		

Solway Firth pSPA – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>The marine assessment concludes that no significant impact is expected on the shore as a result of subsidence or associated seismic events under the marine environment (Chapter 17 Marine Environment, Section 17.30.11, Environmental Statement, West Cumbria Mining 2018). It also concludes that there will be no significant effect from the project through subsidence or associated seismic events on the Solway Firth pSPA, which is the nearest European site (Chapter 17 Marine Environment, Section 17.30.12 et seq, Environmental Statement, West Cumbria Mining 2018). It can therefore be concluded that, whilst subsidence may occur above some of the mined areas offshore (ie beyond the MCZ), due to the slow nature of its development and the overlying 15-20m thick marine sediments, no significant impact is expected.</p> <p>As no significant impact through subsidence is predicted either onshore or offshore, it follows that no significant impact through induced seismicity (i.e. seismicity associated with and induced by subsidence) is expected.</p> <p>There are no other plans or projects known with subsidence impacts which could act in combination with the predicted subsidence from the WCM project and as such no scope of any in-combination impact via this pathway.</p> <p>It is concluded that there will be no adverse effect on the integrity of the pSPA (through impacts on the populations of the pSPA qualifying species or through impacts on supporting habitats or species) through this pathway alone or in combination with other plans or projects.</p>		

Decommissioning Phase

Table 4: Impact mechanisms and pathways during the decommissioning phase of the development – Solway Firth pSPA

Solway Firth pSPA – decommissioning phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
1	Direct loss of or damage to terrestrial habitat – MMS, RLF/UC	Potential loss of terrestrial supporting habitat for pSPA birds through land-take	Please see paragraphs 6.23 et seq in Chapter 6, which provide a detailed assessment.	Yes	Yes
2	Disturbance of marine or terrestrial qualifying species (visual/noise/vibration) – MMS/RLF/UC /UM)	<p>Potential effect on pSPA marine birds within the surrounding functional habitat through:</p> <p>Visual disturbance</p> <p>Human presence</p> <p>Noise</p> <p>Vibration</p>	<p><u>Visual / human disturbance</u></p> <p>Please see paragraphs 6.46 et seq in Chapter 6, which provides a detailed assessment.</p> <p>Disturbance resulting from human presence is directly linked to visual disturbance, i.e. human presence is most likely to have an impact as a result of visual disturbance. Please see paragraphs 6.46 et seq in Chapter 6, which provides a detailed assessment.</p> <p><u>Noise and vibration</u></p> <p>The assessment of noise and vibration in Chapter 14 of the ES has been carried out taking into account designed-in mitigation measures, which are likely to include similar measures to those identified for the construction phase: all plant and equipment should comply with EU noise emission limits; all vehicles and mechanical plant should be fitted with effective exhaust silencers and should be maintained in good efficient working order;</p>	Yes	Yes

Solway Firth pSPA – decommissioning phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>inherently quiet plant will be used where appropriate; all major compressors should be 'sound reduced' models; all ancillary pneumatic percussive tools should be fitted with mufflers or silencers; all ancillary plant such as generators, compressors and pumps should be positioned so as to cause minimum noise disturbance; contractors should be obliged to adhere to the codes of practice given in BS 5228 (Chapter 14 Noise and Vibration, section 14.6.1, Environmental Statement, West Cumbria Mining, 2018).</p> <p>Data collected through desk study complemented by survey data collected during various surveys carried out during the period 2015 to 2018 have led to the conclusion that no parts of the land at the site provide terrestrial supporting habitat for pSPA birds. No impacts on pSPA birds are expected as there is no evidence that the land at the development site is functionally linked with the pSPA (i.e. it is not critical to or necessary for the ecological or behavioural functioning of the qualifying features for which a site has been designated). The closest point of the Solway Firth pSPA is 1.16 km to the north-west of the development land, which is sufficiently distant that noise and vibration related impacts on any qualifying features are not expected. Surveys have also found that the adjacent marine area is only used by small numbers of a limited range of pSPA species, e.g. common scoter, cormorant, common gull, herring gull (BSG Ecology, 2018). Whilst species for which the pSPA is qualified have been recorded, these were all outside the pSPA boundary and may well not form part of the pSPA population).</p> <p>The noise assessment has used ecological receptors, such as St Bees Head SSSI which is c.285m to the north-west of the proposed development site, that are closer to the development site than any of the European sites. Consequently it is reasonable to assume that the conclusions of the assessment for St Bees Head SSSI can be applied to the nearest European</p>		

Solway Firth pSPA – decommissioning phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>site and its qualifying features (i.e. the pSPA). When avoidance and reduction measures are taken into account, disturbance impacts are not likely to extend as far as the pSPA, which is the nearest European site (1.1 km away).</p> <p>The noise and vibration assessment has concluded that during the decommissioning phase, noise or vibration related changes arising from the proposed development will be similar to those predicted for the construction phase. The predicted changes will not impact on the Solway Firth pSPA (Chapter 14 Noise and Vibration, section 14.9.6 et seq, Environmental Statement, West Cumbria Mining, 2018). The noise assessment concludes that construction noise levels at the proposed SPA will be less than 20 dB(A) at the nearest point, which is low compared with prevailing background noise levels; for example, background noise levels in a rural area at night are typically of the order 30 Db(A) (Chapter 14 Noise and Vibration, Table A14.1.1, Environmental Statement, West Cumbria Mining, 2018). Decommissioning noise levels are expected to be similar or lower.</p> <p>In any event, any noise/vibration impacts during the decommissioning phase are likely to be short-term.</p> <p>This is reinforced in the marine assessment (Chapter 17 Marine Environment, Environmental Statement, section 17.33.2, West Cumbria Mining, 2018). There are no planned decommissioning operations which are expected to give rise to noise and/or vibration that will affect any pSPA qualifying species or supporting species or habitats. It is concluded that the pSPA's population of qualifying species will not be affected by noise and vibration.</p> <p>It is concluded that there will be no adverse effect on the integrity of the</p>		

Solway Firth pSPA – decommissioning phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			pSPA (through impacts on the populations of the pSPA qualifying species or through impacts on supporting habitats or species) through this pathway alone or in combination with other plans or projects.		
3	Direct loss of or damage to marine habitat or disturbance to marine species from scouring and/or sedimentation from any discharges from the existing discharge pipe into Saltom Bay	Potential effect on pSPA marine birds both within pSPA boundary and surrounding functional habitat through Impacts on prey availability.	<p>The proposed development will not impact directly on any part of the Solway Firth pSPA. However impacts on marine habitat or disturbance to marine species from scouring and/or sedimentation are possible as a result of discharges of surface water made through the existing sea outfall pipe.</p> <p>Data collected through desk study complemented by survey data collected during various surveys carried out during the period 2015 to 2018 have led to the conclusion that no parts of the land at the development site provide supporting habitat for pSPA birds (BSG Ecology, 2018).</p> <p>Once the mine is closed the above ground structures on the site will be removed and the land reinstated and planted for ecology and recreation. The underground surface water attenuation tank is likely to be disconnected and decommissioned rather than removed to minimise environmental disturbance. Disconnection of the attenuation tank will be the final phase of decommissioning so that it remains in use until the final restoration scheme is in place. It is proposed to replace the storage provided by the attenuation tank with a pond and wetland feature, with an overflow to the pipeline that discharges into the sea (Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, Flood Risk Assessment and Drainage Strategy, section 6.1.4.4, Environmental Statement, West Cumbria Mining, 2018).</p> <p>Discharge rates from the restored site will be reduced compared to the operational phase, as the impermeable surfaces will be removed and replaced by more retentive naturalised catchment. The proposed pond and wetland feature will also provide attenuation during high rainfall events.</p>	Yes	Yes

Solway Firth pSPA – decommissioning phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>During the decommissioning process the proposed development will continue to minimise the potential for scour on the intertidal area around the outfall by limiting, wherever practicable, surface water discharge to when the outlet point is submerged. The discharge pipe runs down the foreshore and terminates in the intertidal zone (it is only fully exposed around low water springs tides). By only discharging surface water when the outlet point is submerged, the potential for scour at the proposed flow rates will be minimised as previously noted for the operational phase (Chapter 17 Marine Environment, Environmental Statement, section 17.31.3, West Cumbria Mining, 2018). In order to minimise potential scour, the maximum flow rate of the discharge will be limited to 25 l/s, which will only be reached during and following heavy rainfall events.</p> <p>All surface water from areas of hard-standing and roofs will be captured during the decommissioning phase and directed via silt traps and oil interceptors to the underground water storage tank for testing prior to discharge to sea using the existing outfall. This will ensure that the maximum permitted flow rate of 25 l/s is not exceeded. However, the interception of surface water will change during the decommissioning phase as building and other infrastructure are removed.</p> <p>When the discharge point is exposed (i.e. not submerged), modelling results indicate that the proposed flow rate would be sufficient to mobilise fine sand material (i.e. no significant sediment re-suspension is likely). However, the sediments at the discharge point location consist of coarse sands (and cobbles and boulders), and so any re-suspended particles are likely to settle out very quickly. It is therefore concluded that any effect on water quality and biota will be localised and of minor significance (Chapter 17 Marine Environment, Environmental Statement, section 17.33.8, West Cumbria</p>		

Solway Firth pSPA – decommissioning phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>Mining, 2018). Modelling work has concluded that the Zone of Influence of the discharge into the sea, when combined with the existing leachate discharge, is 162m from the outfall, which means that the Solway Firth pSPA and its qualifying features will not be directly impacted (Chapter 17 Marine Environment, Environmental Statement, section 17.34.7 et seq, West Cumbria Mining, 2018). Furthermore, as the proposed discharge is not expected to have a significant effect on marine fauna, no indirect impacts on pSPA qualifying features are expected either, e.g. as a result of impacts on prey species.</p> <p>Runoff volumes and flow rates are likely to be lower than during the operational phase, and so the impacts of the discharge are likely to be the same as or less than those predicted in the operational phase.</p> <p>The proposed mitigation measures and the maximum discharge rate (together with rapid mixing and dispersal in the marine environment) will ensure that the effects of the discharge are limited in their extent.</p> <p>As such, an in-combination effect with other plans or projects is considered very unlikely, however, to ensure a comprehensive assessment, other discharges from other plans and projects have also been considered (if they include a proposed discharge to sea which could combine with the 162m zone of influence from the Saltom Bay outfall - Chapter 17 Marine Environment, Environmental Statement, sections 17.34.1 to 17.34.5, West Cumbria Mining, 2018).</p> <p>The zone of influence (ZOI) of the proposed surface water runoff discharge to Saltom Bay has been calculated as approximately 162 m and is over 8 km</p>		

Solway Firth pSPA – decommissioning phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>(by sea) from the mouth of Pow Beck. Hence no in-combination effect is predicted between the two sources of surface water runoff associated with the proposed development. The following licensable discharges to sea are within the vicinity of Saltom Bay and have the potential to interact with the surface water runoff discharges from the Saltom Bay outfall associated with the proposed development (Chapter 17 , paragraph 17.34, of the Environmental Statement):</p> <p>A private sewer discharge outfall is located approximately 350 m from the proposed WCM discharge point and it is permitted to discharge no more than 0.2 m³ per day. The permit associated with this discharge states that the discharge must have no adverse visible effect on the receiving environment. Modelling shows that the private sewer discharge from a pharmacy in Kells (to Saltom Bay) is outside the zone of influence for the WCM discharge (Chapter 17 Marine Environment, paragraph 17.34.7, Environmental Statement, 2018). This is the case even when the outfall is fully exposed at low tide. Due to the separation distance and the very small volume of this discharge, a significant in-combination effect is not predicted to occur (Chapter 17 Marine Environment, paragraph 17.34.8, Environmental Statement, 2018).</p> <p>A United Utilities pumping station discharge (to Saltom Bay) is also outside the zone of influence for the WCM discharge (Chapter 17 Marine Environment, paragraph 17.34.7, Environmental Statement, 2018). The pumping station may only discharge to sea in emergency circumstances when the pumping station is inoperative. No discharge occurs under normal circumstances. Due to the operational restrictions on this outfall, a significant in-combination effect is not predicted (Chapter 17 Marine Environment, paragraph 17.34.9, Environmental Statement, 2018).</p>		

Solway Firth pSPA – decommissioning phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>The Sellafield outfalls extend ~2.1 km from shore into the north-eastern Irish Sea and are located approximately 14.5 km directly south of the Saltom Bay discharge point (~17 km by sea). The Sellafield discharge outfall (at Seascale) is therefore also outside the zone of influence for the WCM discharge (Chapter 17 Marine Environment, paragraph 17.34.7, Environmental Statement, 2018). An in-combination effect is not predicted to occur due to the separation distance (Chapter 17 Marine Environment, paragraph 17.34.11, Environmental Statement, 2018).</p> <p>The United Utilities wastewater treatment works discharge (at Parton, north of Whitehaven) is located approximately 5 km from the proposed discharge point in Saltom Bay. The discharge point of this outfall is therefore also outside the zone of influence for the WCM discharge (Chapter 17 Marine Environment, paragraph 17.34.7, Environmental Statement, 2018). Furthermore, the existing sewage discharge is discharged via diffuser(s) at a distance of ~1.9 km from shore, in the main current flows of the Solway Firth, and has an initial dilution factor of 50, which is generally considered appropriate for secondary treated sewage effluent. The United Utilities wastewater treatment works discharge is therefore considered to have sufficient initial and secondary mixing to ensure that it will not produce cumulative or in-combination impacts with the Saltom Bay discharge. (Chapter 17 Marine Environment, paragraph 17.34.10, Environmental Statement, 2018).</p> <p>There are no other projects which CCC is aware of in the marine environment in the proximity of the proposed mine that need to be included in an in-combination assessment. The NuGen Moorside development is currently on hold, and timescales, the nature and scope of the project, and its potential impacts are unknown. Therefore, no cumulative impact</p>		

Solway Firth pSPA – decommissioning phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>assessment is provided for this development.</p> <p>It is therefore concluded that the discharge will not have a significant effect on the marine environment, either alone or in combination with other discharges from other plans or projects.</p> <p>It is concluded that there will be no adverse effect on the integrity of the pSPA (through impacts on the populations of the pSPA qualifying species or through impacts on supporting habitats or species) through this pathway alone or in combination with other plans or projects.</p>		
4	Direct loss of or damage to marine habitat or disturbance to marine species from scouring and/or sedimentation from any discharges via Pow Beck	Potential effect on pSPA marine birds both within pSPA boundary and surrounding functional habitat through impacts on prey availability	<p>The proposed development will not impact directly on any part of the Solway Firth pSPA. Data collected through desk study complemented by survey data collected during various surveys carried out during the period 2015 to 2018 have led to the conclusion that no parts of the land at the development site provide supporting habitat for pSPA birds (BSG Ecology, 2018).</p> <p>Impacts on marine habitat or disturbance to marine species from scouring and/or sedimentation are, however, possible at the point where Pow Beck discharges to the sea to the south of St Bees (approximately 2.8 km downstream of the development), as a result of the discharge of surface water made to connected watercourses from the conveyor and RLF.</p> <p>Surface water flows, if uncontrolled, have the potential to entrain sediments and contaminants generated by the decommissioning of the proposed development, which may have negative impacts on marine water quality and marine biota. In addition, the flows themselves, if increased, will have the potential to cause scouring around the mouth of Pow Beck. In order to minimise potential scour during the decommissioning phase, discharge and control measures will be adopted at the conveyor and rail loading facility</p>	Yes	Yes

Solway Firth pSPA – decommissioning phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>sites (Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, sections 6.2 and 6.3, Flood Risk Assessment and Drainage Strategy, Environmental Statement, West Cumbria Mining, 2018; Sections 5.7 and 5.10 of the Draft Environmental Management Plan - Appendix E to Chapter 5 Project Description, Environmental Statement, West Cumbria Mining, 2018).</p> <p>Bellhouse Gill and an unnamed tributary of the Pow Beck (both ephemeral watercourses) are intersected by the conveyor route. The conveyor will be buried beneath these ephemeral watercourses and during the operation (and subsequently decommissioning) phase the flow regime at these locations will return to pre-development conditions. There will therefore be no increases in flow rates or discharge volumes to Pow Beck during the operation phase and this is expected to continue during the decommissioning phase as well. Consequently no impacts at St Bees beach due to scour are predicted.</p> <p>Once the mine is closed the above ground structures on the site will be removed and the land reinstated and planted for ecology and recreation. It is expected that the drainage infrastructure would remain in place and continue to function, although removing the buildings and ceasing operation would reduce the runoff and sediment generation from the site. If all the infrastructure is removed, including the drainage system, then the site would revert to its pre-development state.</p> <p>After construction the conveyor box will be backfilled with low permeability material in a way that will minimise ingress and tracking of surface water along the outside of the box structure. At this point the difference between the flow regimes pre and post construction is expected to be negligible (Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, Flood Risk Assessment and Drainage Strategy, section 6.2.1.2, Environmental Statement, West Cumbria Mining, 2018). This situation is expected to continue during the decommissioning phase as the conveyor will be left in</p>		

Solway Firth pSPA – decommissioning phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>situ.</p> <p>During the decommissioning phase the storage lagoons, wetland, drainage pipes and outfalls to receiving watercourses that serve the RLF will remain.</p> <p>Discharge rates from the restored site will be reduced compared to the operational phase, as the impermeable surfaces will be removed and replaced by more retentive naturalised catchment.</p> <p>Consequently, impacts associated with scour at the mouth of the Pow Beck at St Bees Beach are not predicted to occur (Chapter 17 Marine Environment, Environmental Statement, sections 17.29.20 to 17.29.23, West Cumbria Mining, 2018).</p> <p>It is concluded that there will be no adverse effect on the integrity of the pSPA (through impacts on the populations of the pSPA qualifying species or through impacts on supporting habitats or species) through this pathway alone or in combination with other plans or projects.</p> <p>In relation to the risk of scouring there is predicted to be no impact at the point where the Pow Beck discharges to the sea from WCM's project and so no risk of any in combination impact.</p>		
5	Dust and other airborne contamination of marine and terrestrial habitats – MMS/RLF/UC	Potential effect on pSPA marine birds both within pSPA boundary and surrounding functional habitat through impacts on prey	<p>Please see paragraphs 6.157 et seq in Chapter 6, which provide a detailed assessment of the effects of dust.</p> <p>Please see paragraphs 6.161 et seq in Chapter 6, which provide a detailed assessment of the effects of NOx.</p> <p>Please see paragraphs 6.163 et seq in Chapter 6, which provide a detailed assessment of the effects of N deposition.</p>	Yes	Yes

Solway Firth pSPA – decommissioning phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
		availability	It is important to note that the analysis of air quality impacts presented in the above sections represents, as is legally required, a cumulative assessment of the proposed development (i.e. in combination with other plans and projects). This covers dust, traffic, and other operational controlled emissions and is explained in detail in the air quality assessment (Chapter 15 Air Quality, section 15.7, paragraph 15.7.1 - 15.7.4 [dust], paragraph 15.7.5 – 15.7.10 [traffic], paragraph 15.7.11 – 15.7.12 [controlled emissions], Environmental Statement, 2018)).		
6	Deterioration of marine water quality as a result of sediment-laden surface water run-off via Saltom Bay outfall	<p>Potential effect on pSPA marine birds within pSPA boundary and adjacent functional habitat including impacts on prey availability through:</p> <p>Escape of sediment-entrained surface water during the decommission phase</p>	<p>The proposed development will not impact directly on any part of the Solway Firth pSPA. Impacts on marine water quality are possible as a result of discharges of surface water made through the existing sea outfall pipe.</p> <p>Data collected through desk study complemented by survey data collected during various surveys carried out during the period 2015 to 2018 have led to the conclusion that no parts of the land at the development site provide supporting habitat for pSPA birds (BSG Ecology, 2018).</p> <p>Consequently any future use of the site by pSPA birds will take place whilst the site is operational, i.e. use of the site will take place whilst there is disturbance associated with the operation of the site. It is expected that disturbance during the decommissioning phase will be the same as or less than the disturbance experienced during the operational phase.</p> <p>The discharge of water to sea during the decommissioning phase could have similar impacts as those predicted during the operational phase. In the absence of mitigation measures, the release of sediment-laden surface water into the marine environment could potentially impact on pSPA qualifying features directly (if they are present in the vicinity of the discharge</p>	Yes	Yes

Solway Firth pSPA – decommissioning phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>pipe), for example as a result of habitat deterioration due to sediment laden water, or indirectly, by impacting on the prey species or habitats that pSPA qualifying features depend upon.</p> <p>However, the effects of suspended solids on the marine environment will be fully mitigated during the decommissioning phase. The planned decommissioning phase is over 50 years away, and WCM expect that in the final few years leading up to decommissioning, close liaison will be required with the environmental regulatory body(ies) in force at the time to develop a detailed decommissioning plan which takes full account of the requirement to minimise environmental impacts.</p> <p>All surface water from areas of hard-standing and roofs will be captured during the decommissioning phase and directed via silt traps and oil interceptors to the underground water storage tank for testing prior to discharge to sea using the existing outfall. However, the interception of surface water will change during the decommissioning phase as buildings and other infrastructure are removed.</p> <p>Storm water flows will be accommodated in the storm water attenuation tank on site (total capacity 6,500m³) (Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, Flood Risk Assessment and Drainage Strategy, Section 6.1.4.3, Environmental Statement, West Cumbria Mining, 2018). In exceptional circumstances, a storm water discharge may be required. Storm water flows will go to sea via the existing discharge point, and they will first be passed through silt traps and oil interceptors (although it should be noted that during the decommissioning phase silt mobilisation will be limited once the bund vegetation is established, and no oils will be stored outside). All pollutants will be controlled through the adoption of best practice measures (Draft Environmental Management Plan - Appendix E to Chapter 5 Project</p>		

Solway Firth pSPA – decommissioning phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>Description, Sections 5.7 and 5.10, Environmental Statement, West Cumbria Mining, 2018).</p> <p>The discharge will be at a maximum flow rate of 25 l/s (Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, Flood Risk Assessment and Drainage Strategy, section 6.1.4.2 et seq, Environmental Statement, West Cumbria Mining, 2018). The attenuation measures described above will ensure that the maximum permitted flow rate of 25 l/s is not exceeded.</p> <p>Discharged surface water will necessarily have to achieve the environmental permit standard that will be set by the consenting authority (Chapter 5, Environmental Statement, Appendix E, Section 6, West Cumbria Mining, 2018). A Marine Environmental Monitoring Plan will be implemented to assess the potential impacts of the discharge (Chapter 17 Marine Environment, Appendix C, paragraph 4.12, Environmental Statement, West Cumbria Mining, 2018). Once the mine is closed the above ground structures on the site will be removed and the land reinstated and planted for ecology and recreation. The underground surface water attenuation tank is likely to be disconnected and decommissioned rather than removed to minimise environmental disturbance. Disconnection of the attenuation tank will be the final phase of decommissioning so that it remains in use until the final restoration scheme is in place. It is proposed to replace the storage provided by the attenuation tank with a pond and wetland feature, with an overflow to the pipeline that discharges into the sea (Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, Flood Risk Assessment and Drainage Strategy, section 6.1.4.4, Environmental Statement, West Cumbria Mining, 2018).</p> <p>Discharge rates from the restored site will be reduced compared to the operational phase, as the impermeable surfaces will be removed and</p>		

Solway Firth pSPA – decommissioning phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>replaced by more retentive naturalised catchment. The proposed pond and wetland feature will also provide attenuation during high rainfall events.</p> <p>The ongoing discharge of surface water to sea could have impacts on marine water quality and local marine biota. While contaminants in the restored site are not predicted to be significant, entrainment of sediments could lead to increases in turbidity and smothering effects on biota. Deterioration of marine water quality is not likely due to the provision of appropriate water treatment, which will necessarily have to achieve the environmental permit standard that will be set by the consenting authority (Chapter 5, Environmental Statement, Appendix E, Section 6, West Cumbria Mining, 2018; Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, Flood Risk Assessment and Drainage Strategy, Environmental Statement, West Cumbria Mining, 2018 sets out details of the water treatment facilities during operation [section 6.1.4.4]).</p> <p>The input of freshwater into the marine environment could also impact marine biota via salinity stress. The discharge would need to be subject to a discharge permit, and any and all conditions of the discharge permit will have to be adhered to. Although runoff volumes and flow rates are likely to be lower than during the operational phase, given the permanent nature of the discharge, it is likely that the impacts of the discharge post decommissioning would continue to be minor.</p> <p>Modelling work has concluded that the Zone of Influence of the discharge into the sea, when combined with the existing leachate discharge, is 162m from the outfall, which means that the Solway Firth pSPA and its qualifying features will not be directly impacted (Chapter 17 Marine Environment, Environmental Statement, section 17.34.7 et seq, West Cumbria Mining, 2018). Furthermore, as the proposed discharge is not expected to have a significant effect on marine fauna, no indirect impacts on pSPA qualifying</p>		

Solway Firth pSPA – decommissioning phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>features are expected either, e.g. as a result of impacts on prey species.</p> <p>The proposed mitigation measures and the maximum discharge rate (together with rapid mixing and dispersal in the marine environment) will ensure that the effects of the discharge are limited in their extent. No significant effects are likely on the marine environment (Chapter 17 Marine Environment, paragraph 17.33.8, Environmental Statement, West Cumbria Mining, 2018), indeed any such impact is regarded as negligible. Consequently it is not expected that the discharge of sediment laden surface water will impact directly or indirectly on the pSPA's population of qualifying features or their supporting habitats or species. The hydrological assessment has concluded that, with respect to groundwater and surface water, no pathway is considered to exist between the proposed development and any other proposed development (Chapter 12 Hydrology & Hydrogeology, Section 12.8, Environmental Statement, West Cumbria Mining, 2018).</p> <p>As such, an in-combination effect with other plans or projects is considered very unlikely, however, to ensure a comprehensive assessment, other discharges from other plans and projects have also been considered (if they include a proposed discharge to sea which could combine with the 162m zone of influence from the Saltom Bay outfall (Chapter 17 Marine Environment, Environmental Statement, section 17.34.1 et seq, West Cumbria Mining, 2018).</p> <p>The zone of influence (ZOI) of the proposed surface water runoff discharge to Saltom Bay has been calculated as approximately 162 m and is over 8 km (by sea) from the mouth of Pow Beck. Hence no in-combination effect is predicted between the two sources of surface water runoff associated with the proposed development. The following licensable discharges to sea are within the vicinity of Saltom Bay and have the potential to interact with the</p>		

Solway Firth pSPA – decommissioning phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>surface water runoff discharges from the Saltom Bay outfall associated with the proposed development (Chapter 17 , paragraph 17.34, of the Environmental Statement):</p> <p>A private sewer discharge outfall is located approximately 350 m from the proposed WCM discharge point and it is permitted to discharge no more than 0.2 m³ per day. The permit associated with this discharge states that the discharge must have no adverse visible effect on the receiving environment. Modelling shows that the private sewer discharge from a pharmacy in Kells (to Saltom Bay) is outside the zone of influence for the WCM discharge (Chapter 17 Marine Environment, paragraph 17.34.7, Environmental Statement, 2018). This is the case even when the outfall is fully exposed at low tide. Due to the separation distance and the very small volume of this discharge, a significant in-combination effect is not predicted to occur (Chapter 17 Marine Environment, paragraph 17.34.8, Environmental Statement, 2018).</p> <p>A United Utilities pumping station discharge (to Saltom Bay) is also outside the zone of influence for the WCM discharge (Chapter 17 Marine Environment, paragraph 17.34.7, Environmental Statement, 2018). The pumping station may only discharge to sea in emergency circumstances when the pumping station is inoperative. No discharge occurs under normal circumstances. Due to the operational restrictions on this outfall, a significant in-combination effect is not predicted (Chapter 17 Marine Environment, paragraph 17.34.9, Environmental Statement, 2018).</p> <p>The Sellafield outfalls extend ~2.1 km from shore into the north-eastern Irish Sea and are located approximately 14.5 km directly south of the Saltom Bay discharge point (~17 km by sea). The Sellafield discharge outfall (at Seascale) is therefore also outside the zone of influence for the WCM</p>		

Solway Firth pSPA – decommissioning phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>discharge (Chapter 17 Marine Environment, paragraph 17.34.7, Environmental Statement, 2018). An in-combination effect is not predicted to occur due to the separation distance (Chapter 17 Marine Environment, paragraph 17.34.11, Environmental Statement, 2018).</p> <p>The United Utilities wastewater treatment works discharge (at Parton, north of Whitehaven) is located approximately 5 km from the proposed discharge point in Saltom Bay. The discharge point of this outfall is therefore also outside the zone of influence for the WCM discharge (Chapter 17 Marine Environment, paragraph 17.34.7, Environmental Statement, 2018). Furthermore, the existing sewage discharge is discharged via diffuser(s) at a distance of ~1.9 km from shore, in the main current flows of the Solway Firth, and has an initial dilution factor of 50, which is generally considered appropriate for secondary treated sewage effluent. The United Utilities wastewater treatment works discharge is therefore considered to have sufficient initial and secondary mixing to ensure that it will not produce cumulative or in-combination impacts with the Saltom Bay discharge. (Chapter 17 Marine Environment, paragraph 17.34.10, Environmental Statement, 2018).</p> <p>There are no other projects which CCC is aware of in the marine environment in the proximity of the proposed mine that need to be included in an in-combination assessment. The NuGen Moorside development is currently on hold, and timescales, the nature and scope of the project, and its potential impacts are unknown. Therefore, no cumulative impact assessment is provided for this development.</p> <p>It is therefore concluded that the discharge will not have a significant effect on the marine environment, either alone or in combination with other discharges from other plans or projects; predicted effects during the</p>		

Solway Firth pSPA – decommissioning phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>decommissioning phase will be the same as or less than the predicted effects during the construction phase (Chapter 17 Marine Environment, Environmental Statement, sections 17.29.8.11 and 17.34.7, West Cumbria Mining, 2018).</p> <p>It is concluded that there will be no adverse effect on the integrity of the pSPA (through impacts on the populations of the pSPA qualifying species or through impacts on supporting habitats or species) through this pathway alone or in combination with other plans or projects.</p>		
7	Deterioration of marine water quality as a result of mobilisation of pollutants (including changes in pH, temperature, salinity, and dissolved oxygen) in surface water discharged via Saltom Bay outfall	<p>Potential effect on pSPA marine birds within pSPA boundary and adjacent functional habitat including impacts on prey availability through:</p> <p>Mobilisation of underground contaminants disturbed</p> <p>Potential for pollution incidents from spillages,</p>	<p>The proposed development will not impact directly on any part of the Solway Firth pSPA. Impacts on marine water quality are possible as a result of discharges of surface water made through the existing sea outfall pipe.</p> <p>Data collected through desk study complemented by survey data collected during various surveys carried out during the period 2015 to 2018 have led to the conclusion that no parts of the development site provide supporting habitat for pSPA birds (BSG Ecology, 2018).</p> <p>In the absence of mitigation measures, the release of pollutants into the marine environment could potentially impact on pSPA qualifying features directly (if they are present in the vicinity of the discharge pipe), for example as a result of toxic effects, or indirectly, by impacting on the prey species that pSPA qualifying features depend upon.</p> <p>There are potential impacts associated with the discharge and these are related to non-toxic inputs. These include the effects of pH, temperature, salinity and dissolved oxygen. The marine assessment has concluded that, during the construction phase, the proposed discharge of surface water into the marine environment is not likely to have a significant effect on pH,</p>	Yes	Yes

Solway Firth pSPA – decommissioning phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
		leakages etc from stored chemicals, fuel and oils on site.	<p>salinity, water temperature of dissolved oxygen (Chapter 17 Marine Environment, Environmental Statement, West Cumbria Mining, 2018, paragraphs 17.29.12 [pH], 17.29.14-17 [salinity], 17.29.13 [water temperature], 17.29.18 [dissolved oxygen]). Conditions during the decommissioning phase are expected to be the same or better than those predicted for the construction phase.</p> <p>However, the effects of pollutants on the marine environment will be fully mitigated during the decommissioning phase. The planned decommissioning phase is over 50 years away, and WCM expect that in the final few years leading up to decommissioning, close liaison will be required with the environmental regulatory body(ies) in force at the time to develop a detailed decommissioning plan which takes full account of the requirement to minimise environmental impacts.</p> <p>All surface water from areas of hard-standing and roofs will be captured during the decommissioning phase and directed via silt traps and oil interceptors to the underground water storage tank for testing prior to discharge to sea using the existing outfall. However, the interception of surface water will change during the decommissioning phase as buildings and other infrastructure are removed.</p> <p>The discharge will be at a maximum flow rate of 25 l/s (Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, Flood Risk Assessment and Drainage Strategy, section 6.1.4.2 et seq, Environmental Statement, West Cumbria Mining, 2018). The attenuation measures described above will ensure that the maximum permitted flow rate of 25 l/s is not exceeded.</p> <p>Discharged surface water will necessarily have to achieve the environmental permit standard that will be set by the consenting authority (Chapter 5, Environmental Statement, Appendix E, Section 6, West Cumbria Mining,</p>		

Solway Firth pSPA – decommissioning phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>2018; Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, Flood Risk Assessment and Drainage Strategy, section 6.1.3.3, Environmental Statement, West Cumbria Mining, 2018). All other pollutants will be controlled through the adoption of best practice measures (Draft Environmental Management Plan - Appendix E to Chapter 5 Project Description, Sections 5.7 and 5.10, Environmental Statement, West Cumbria Mining, 2018). A Marine Environmental Monitoring Plan will be implemented to assess the potential impacts of the discharge (Chapter 17 Marine Environment, Appendix C, paragraph 4.12, Environmental Statement, West Cumbria Mining, 2018).</p> <p>Once the mine is closed the above ground structures on the site will be removed and the land reinstated and planted for ecology and recreation. The underground surface water attenuation tank is likely to be disconnected and decommissioned rather than removed to minimise environmental disturbance. Disconnection of the attenuation tank will be the final phase of decommissioning so that it remains in use until the final restoration scheme is in place. It is proposed to replace the storage provided by the attenuation tank with a pond and wetland feature, with an overflow to the pipeline that discharges into the sea.</p> <p>Discharge rates from the restored site will be reduced compared to the operational phase, as the impermeable surfaces will be removed and replaced by a more retentive naturalised catchment. The proposed pond and wetland feature will also provide attenuation during high rainfall events (Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, Flood Risk Assessment and Drainage Strategy, section 6.1.4.4, Environmental Statement, West Cumbria Mining, 2018).</p> <p>Modelling work has concluded that the Zone of Influence of the discharge</p>		

Solway Firth pSPA – decommissioning phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>into the sea, when combined with the existing leachate discharge, is 162m from the outfall, which means that the Solway Firth pSPA and its qualifying features will not be directly impacted (Chapter 17 Marine Environment, Environmental Statement, section 17.34.7 et seq, West Cumbria Mining, 2018). Furthermore, as the proposed discharge is not expected to have a significant effect on marine fauna, no indirect impacts on pSPA qualifying features are expected either, e.g. as a result of impacts on prey species.</p> <p>The proposed mitigation measures and the maximum discharge rate (together with rapid mixing and dispersal in the marine environment) will ensure that the effects of the discharge are limited in their extent. During the decommissioning phase runoff volumes and flow rates are likely to be lower than during the operational phase: given the permanent nature of the discharge, it is likely that the impacts of the discharge post decommissioning would continue to be minor. Taking this into account it is therefore concluded that any effect on water quality and biota will be localised and of minor significance (Chapter 17 Marine Environment, paragraph 17.33.8, Environmental Statement, West Cumbria Mining, 2018). Consequently it is not expected that the discharge of pollutants (including changes in pH, temperature, salinity, and dissolved oxygen) will impact directly or indirectly on pSPA populations of qualifying features or their supporting habitats or species.</p> <p>The hydrological assessment has concluded that, with respect to groundwater and surface water, no pathway is considered to exist between the proposed development and any other proposed development (Chapter 12 Hydrology & Hydrogeology, Section 12.8, Environmental Statement, West Cumbria Mining, 2018).</p> <p>As such, an in-combination effect with other plans or projects is considered</p>		

Solway Firth pSPA – decommissioning phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>very unlikely, however, to ensure a comprehensive assessment, other discharges from other plans and projects have also been considered (if they include a proposed discharge to sea which could combine with the 162m zone of influence from the Saltom Bay outfall (Chapter 17 Marine Environment, Environmental Statement, section 17.34.1 et seq, West Cumbria Mining, 2018).</p> <p>The zone of influence (ZOI) of the proposed surface water runoff discharge to Saltom Bay has been calculated as approximately 162 m and is over 8 km (by sea) from the mouth of Pow Beck. Hence no in-combination effect is predicted between the two sources of surface water runoff associated with the proposed development.</p> <p>The following licensable discharges to sea are within the vicinity of Saltom Bay and have the potential to interact with the surface water runoff discharges from the Saltom Bay outfall associated with the proposed development (Chapter 17 , paragraph 17.34, of the Environmental Statement:</p> <p>A private sewer discharge outfall is located approximately 350 m from the proposed WCM discharge point and it is permitted to discharge no more than 0.2 m³ per day. The permit associated with this discharge states that the discharge must have no adverse visible effect on the receiving environment. Modelling shows that the private sewer discharge from a pharmacy in Kells (to Saltom Bay) is outside the zone of influence for the WCM discharge (Chapter 17 Marine Environment, paragraph 17.34.7, Environmental Statement, 2018). This is the case even when the outfall is fully exposed at low tide. Due to the separation distance and the very small volume of this discharge, a significant in-combination effect is not predicted to occur (Chapter 17 Marine Environment, paragraph 17.34.8, Environmental</p>		

Solway Firth pSPA – decommissioning phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>Statement, 2018).</p> <p>A United Utilities pumping station discharge (to Saltom Bay) is also outside the zone of influence for the WCM discharge (Chapter 17 Marine Environment, paragraph 17.34.7, Environmental Statement, 2018). The pumping station may only discharge to sea in emergency circumstances when the pumping station is inoperative. No discharge occurs under normal circumstances. Due to the operational restrictions on this outfall, a significant in-combination effect is not predicted (Chapter 17 Marine Environment, paragraph 17.34.9, Environmental Statement, 2018).</p> <p>The Sellafield outfalls extend ~2.1 km from shore into the north-eastern Irish Sea and are located approximately 14.5 km directly south of the Saltom Bay discharge point (~17 km by sea). The Sellafield discharge outfall (at Seascale) is therefore also outside the zone of influence for the WCM discharge (Chapter 17 Marine Environment, paragraph 17.34.7, Environmental Statement, 2018). An in-combination effect is not predicted to occur due to the separation distance (Chapter 17 Marine Environment, paragraph 17.34.11, Environmental Statement, 2018).</p> <p>The United Utilities wastewater treatment works discharge (at Parton, north of Whitehaven) is located approximately 5 km from the proposed discharge point in Saltom Bay. The discharge point of this outfall is therefore also outside the zone of influence for the WCM discharge (Chapter 17 Marine Environment, paragraph 17.34.7, Environmental Statement, 2018). Furthermore, the existing sewage discharge is discharged via diffuser(s) at a distance of ~1.9 km from shore, in the main current flows of the Solway Firth, and has an initial dilution factor of 50, which is generally considered appropriate for secondary treated sewage effluent. The United Utilities wastewater treatment works discharge is therefore considered to have</p>		

Solway Firth pSPA – decommissioning phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>sufficient initial and secondary mixing to ensure that it will not produce cumulative or in-combination impacts with the Saltom Bay discharge. (Chapter 17 Marine Environment, paragraph 17.34.10, Environmental Statement, 2018).</p> <p>There are no other projects which CCC is aware of in the marine environment in the proximity of the proposed mine that need to be included in an in-combination assessment. The NuGen Moorside development is currently on hold, and timescales, the nature and scope of the project, and its potential impacts are unknown. Therefore, no cumulative impact assessment is provided for this development.</p> <p>It is therefore concluded that the discharge will not have a significant effect on the marine environment, either alone or in combination with other discharges from other plans or projects; predicted effects during the decommissioning phase will be the same as or less than the predicted effects during the construction phase (Chapter 17 Marine Environment, Environmental Statement, sections 17.29.8 to 17.29.11, 17.33.7 and 17.34.7, West Cumbria Mining, 2018).</p> <p>It is concluded that there will be no adverse effect on the integrity of the pSPA (through impacts on the populations of the pSPA qualifying species or through impacts on supporting habitats or species) through this pathway alone or in combination with other plans or projects.</p>		
8	Deterioration of marine water quality as a result of sediment-	Potential effect on pSPA marine birds within pSPA boundary and adjacent	The proposed development will not impact directly on any part of the Solway Firth pSPA; however, impacts on marine water quality are possible as a result of discharges of surface water made from the RLF and Conveyor to the Bellhouse Gill and Pow Beck, which eventually discharges to the sea to the south of St Bees approximately 2.8 km downstream of the development.	Yes	Yes

Solway Firth pSPA – decommissioning phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
	laden surface water run-off during decommissioning, via Pow Beck catchment	functional habitat including impacts on prey availability through surface water discharge and run-off	<p>Data collected through desk study complemented by survey data collected during various surveys carried out during the period 2015 to 2018 have led to the conclusion that no parts of the land at the development site provide supporting habitat for pSPA birds (BSG Ecology, 2018).</p> <p>In the absence of mitigation the release of sediment-laden surface water via the Pow Beck into the marine environment could potentially impact on pSPA qualifying features directly (if they are present in the vicinity of the Pow Beck where it discharges to sea at St Bees Beach), for example as a result of habitat deterioration due to sediment-laden water, or indirectly, by impacting on the prey species that pSPA qualifying features depend upon. The effects of suspended solids (transported via the Pow Beck) on the marine environment will be fully mitigated through measures that will be adopted during the decommissioning phase at the conveyor and rail loading facility sites (Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, sections 6.2 and 6.3, Flood Risk Assessment and Drainage Strategy, Environmental Statement, West Cumbria Mining, 2018; Sections 5.7 and 5.10 of the Draft Environmental Management Plan - Appendix E to Chapter 5 Project Description, Environmental Statement, West Cumbria Mining, 2018).</p> <p>Bellhouse Gill and an unnamed tributary of the Pow Beck (both ephemeral watercourses) are intersected by the conveyor route. The conveyor will be buried beneath these ephemeral watercourses and during the operation phase the flow regime at these locations will return to pre-development conditions and this is expected to continue during the decommissioning phase. There will therefore be no increases in flow rates or discharge volumes to Pow Beck during the operation phase and this is expected to continue during the decommissioning phase as well. The conveyor route will remain enclosed, which will minimise the chance of contamination of local watercourses during the decommissioning phase.</p>		

Solway Firth pSPA – decommissioning phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>After construction the conveyor box will be backfilled with low permeability material in a way that will minimise ingress and tracking of surface water along the outside of the box structure. At this point the difference between the flow regimes pre and post construction is expected to be negligible (Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, Flood Risk Assessment and Drainage Strategy, section 6.2.1.2, Environmental Statement, West Cumbria Mining, 2018). This situation is expected to continue during the decommissioning phase as the conveyor will be left in situ.</p> <p>During the decommissioning phase the storage lagoons, wetland, drainage pipes and outfalls to receiving watercourses that serve the RLF will remain.</p> <p>Once the mine is closed the above ground structures on the site will be removed and the land reinstated and planted for ecology and recreation. It is expected that the drainage infrastructure would remain in place and continue to function, although removing the buildings and ceasing operation would reduce the runoff and sediment generation from the site. If all the infrastructure is removed, including the drainage system, then the site would revert to its pre-development state. Discharge rates from the restored site will be reduced compared to the operational phase, as the impermeable surfaces will be removed and replaced by more retentive naturalised catchment.</p> <p>Dilution effects within Bellhouse Gill and Pow Beck will also reduce the environmental concentrations of any contaminants present (though this is considered unlikely once good practice measures are in place) to the point where they are not predicted to have any significant impact on the marine environment. Predicted effects during the decommissioning phase will be the</p>		

Solway Firth pSPA – decommissioning phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>same as or less than the predicted effects during the construction phase. (Chapter 17 Marine Environment, paragraph 17.29.21 – 17.29.23, Environmental Statement, West Cumbria Mining, 2018).</p> <p>These good practice measures, in conjunction with mixing and dilution effects of the freshwater watercourses, mean that, no significant pollution impact on the marine environment is predicted via the Pow Beck pathway (see Chapter 17, Marine Environment, paragraph 17.29.22, Environmental Statement, 2018), indeed any such impact is regarded as negligible. Consequently it is not expected that the discharge to Pow Beck will impact directly or indirectly on pSPA populations of qualifying features or their supporting habitats or species.</p> <p>The hydrological assessment has concluded that, with respect to groundwater and surface water, no pathway is considered to exist between the proposed development and any other proposed development (Chapter 12 Hydrology & Hydrogeology, Section 12.8, Environmental Statement, West Cumbria Mining, 2018).</p> <p>As such an in-combination effect with other plans or projects is considered very unlikely, however, to ensure a comprehensive assessment, nearby licensable discharges to sea in the vicinity of the mouth of Pow Beck have nevertheless been investigated.</p> <p>The zone of influence (ZOI) of the proposed surface water runoff discharge to Saltom Bay has been calculated as approximately 162 m and is over 8 km (by sea) from the mouth of Pow Beck. Hence no in-combination effect is predicted between the two sources of surface water runoff associated with the proposed development.</p>		

Solway Firth pSPA – decommissioning phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>The closest licensed discharge to the mouth of Pow Beck is a United Utilities pumping station located at Nethertown, which has a permit to discharge to sea (permit no. 017470153) approximately 4 km south of the mouth of Pow Beck. However, under the conditions of the permit, the pumping station may only discharge to sea in emergency circumstances when the pumping station is inoperative as a result of e.g. electrical failure or rising main failure. No discharge occurs under normal circumstances. For this reason this discharge has been scoped out of the in-combination impact assessment.</p> <p>The United Utilities WwTW located at Braystones, south of Nethertown, discharges to sea via a long sea outfall (permit no. 017470152). The discharge point of this outfall is located approximately 7 km south from the mouth of Pow Beck and hence any combined effect between it and any discharges made via Pow Beck is very unlikely. Furthermore, the existing sewage discharge is discharged via diffuser(s) at a distance of ~2 km from shore and has an initial dilution factor generally considered appropriate for secondary treated sewage effluent. The existing discharge is therefore considered to have sufficient initial and secondary mixing to ensure that it will not produce cumulative or in-combination impacts with other discharges.</p> <p>The Sellafield outfalls extend ~2.1 km from shore into the north-eastern Irish Sea and are located approximately 8.8 km from the mouth of Pow Beck and hence, again, it is considered highly unlikely that the two plumes will interact. Furthermore, the two discharges are not similar; the proposed discharges to Pow Beck are ambient temperature freshwater which, with good practice guidelines in place, will not be contaminated, while the Sellafield discharge is a cooling water discharge, i.e. warm seawater. There is therefore no realistic likelihood of in-combination effects between the two discharges.</p>		

Solway Firth pSPA – decommissioning phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			There are no other projects which CCC is aware of in the marine environment in the proximity of the proposed mine that need to be included in an in-combination assessment. The NuGen Moorside development is currently on hold, and timescales, the nature and scope of the project, and its potential impacts are unknown. Therefore, no cumulative impact assessment is provided for this development. It is concluded that there will be no adverse effect on the integrity of the pSPA (through impacts on the populations of the pSPA qualifying species or through impacts on supporting habitats or species) through this pathway alone or in combination with other plans or projects.		
9	Deterioration of marine water quality as a result of disturbance of contaminated land and mobilisation of pollutants (including changes in pH, temperature, salinity, and dissolved oxygen) discharged	Potential effect on pSPA marine birds within pSPA boundary and adjacent functional habitat including impacts on prey availability through: Mobilisation of underground contaminants disturbed Potential for pollution	The proposed development will not impact directly on any part of the Solway Firth pSPA; however, impacts on marine water quality are possible as a result of discharges of surface water made from the RLF and Conveyor to the Bellhouse Gill and Pow Beck, which eventually discharges to the sea to the south of St Bees approximately 2.8 km downstream of the development. Data collected through desk study complemented by survey data collected during various surveys carried out during the period 2015 to 2018 have led to the conclusion that no parts of the land at the development site provide supporting habitat for pSPA birds (BSG Ecology, 2018). In the absence of mitigation the release of pollutants into the marine environment could potentially impact on SPA qualifying features directly (if they are present in the vicinity of the Pow Beck where it discharges to sea), for example as a result of toxic effects, or indirectly, by impacting on the prey species that SPA qualifying features depend upon. There are also potential impacts associated with the discharge related to non-toxic inputs. These include the effects of pH, temperature, salinity and dissolved oxygen.	Yes	Yes

Solway Firth pSPA – decommissioning phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
	via Pow Beck catchment	incidents from spillages, leakages etc from stored chemicals, fuel and oils on site.	<p>During the decommissioning phase, pollution effects will be fully mitigated through the adoption of discharge and control measures at the conveyor and rail loading facility sites (Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, sections 6.2 and 6.3, Flood Risk Assessment and Drainage Strategy, Environmental Statement, West Cumbria Mining, 2018; Sections 5.7 and 5.10 of the Draft Environmental Management Plan - Appendix E to Chapter 5 Project Description, Environmental Statement, West Cumbria Mining, 2018).</p> <p>Bellhouse Gill and an unnamed tributary of the Pow Beck (both ephemeral watercourses) are intersected by the conveyor route. The conveyor will be buried beneath these ephemeral watercourses and during the operation phase the flow regime at these locations will return to pre-development conditions and this is expected to continue during the decommissioning phase. There will therefore be no increases in flow rates or discharge volumes to Pow Beck during the operation phase and this is expected to continue during the decommissioning phase as well. The conveyor route will remain enclosed, which will minimise the chance of contamination of local watercourses during the decommissioning phase.</p> <p>After construction the conveyor box will be backfilled with low permeability material in a way that will minimise ingress and tracking of surface water along the outside of the box structure. At this point the difference between the flow regimes pre and post construction is expected to be negligible (Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, Flood Risk Assessment and Drainage Strategy, section 6.2.1.2, Environmental Statement, West Cumbria Mining, 2018). This situation is expected to continue during the decommissioning phase as the conveyor will be left in situ.</p>		

Solway Firth pSPA – decommissioning phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>During the decommissioning phase the storage lagoons, wetland, drainage pipes and outfalls to receiving watercourses that serve the RLF will remain.</p> <p>Discharge rates from the restored site will be reduced compared to the operational phase, as the impermeable surfaces will be removed and replaced by more retentive naturalised catchment.</p> <p>Once the mine is closed the above ground structures on the site will be removed and the land reinstated and planted for ecology and recreation. It is expected that the drainage infrastructure would remain in place and continue to function, although removing the buildings and ceasing operation would reduce the runoff and sediment generation from the site. If all the infrastructure is removed, including the drainage system, then the site would revert to its pre-development state.</p> <p>Dilution effects within Bellhouse Gill and Pow Beck will also reduce the environmental concentrations of any contaminants present (though this is considered unlikely once good practice measures are in place) to the point where they are not predicted to have any significant impact on the marine environment. Predicted effects during the decommissioning phase will be the same as or less than the predicted effects during the construction phase (Chapter 17 Marine Environment, paragraph 17.29.21 – 17.29.23, Environmental Statement, West Cumbria Mining, 2018).</p> <p>The implementation of these good practice measures, in conjunction with mixing and dilution effects of the freshwater watercourses, mean that , no significant pollution impact on the marine environment is predicted via the Pow Beck pathway (see Chapter 17, Marine Environment, paragraph 17.29.22, Environmental Statement, 2018), indeed any such impact is</p>		

Solway Firth pSPA – decommissioning phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>regarded as negligible. Consequently it not expected that the discharge of pollutants to Pow Beck (including changes in pH, temperature, salinity, and dissolved oxygen) will impact directly or indirectly on pSPA populations of qualifying features or their supporting habitats or species.</p> <p>The hydrological assessment has concluded that, with respect to groundwater and surface water, no pathway is considered to exist between the proposed development and any other proposed development (Chapter 12 Hydrology & Hydrogeology, Section 12.8, Environmental Statement, West Cumbria Mining, 2018).</p> <p>As such an in-combination effect with other plans or projects is considered very unlikely, however, to ensure a comprehensive assessment, nearby licensable discharges to sea in the vicinity of the mouth of Pow Beck have nevertheless been investigated.</p> <p>The zone of influence (ZOI) of the proposed surface water runoff discharge to Saltom Bay has been calculated as approximately 162 m and is over 8 km (by sea) from the mouth of Pow Beck. Hence no in-combination effect is predicted between the two sources of surface water runoff associated with the proposed development.</p> <p>The closest licensed discharge to the mouth of Pow Beck is a United Utilities pumping station located at Nethertown, which has a permit to discharge to sea (permit no. 017470153) approximately 4 km south of the mouth of Pow Beck. However, under the conditions of the permit, the pumping station may only discharge to sea in emergency circumstances when the pumping station is inoperative as a result of e.g. electrical failure or rising main failure. No discharge occurs under normal circumstances. For this reason this discharge has been scoped out of the in-combination impact assessment.</p>		

Solway Firth pSPA – decommissioning phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>The United Utilities WwTW located at Braystones, south of Nethertown, discharges to sea via a long sea outfall (permit no. 017470152). The discharge point of this outfall is located approximately 7 km south from the mouth of Pow Beck and hence any combined effect between it and any discharges made via Pow Beck is very unlikely. Furthermore, the existing sewage discharge is discharged via diffuser(s) at a distance of ~2 km from shore and has an initial dilution factor generally considered appropriate for secondary treated sewage effluent. The existing discharge is therefore considered to have sufficient initial and secondary mixing to ensure that it will not produce cumulative or in-combination impacts with other discharges.</p> <p>The Sellafield outfalls extend ~2.1 km from shore into the north-eastern Irish Sea and are located approximately 8.8 km from the mouth of Pow Beck and hence, again, it is considered highly unlikely that the two plumes will interact. Furthermore, the two discharges are not similar; the proposed discharges to Pow Beck are ambient temperature freshwater which, with good practice guidelines in place, will not be contaminated, while the Sellafield discharge is a cooling water discharge, i.e. warm seawater. There is therefore no realistic likelihood of in-combination effects between the two discharges.</p> <p>There are no other projects which CCC is aware of in the marine environment in the proximity of the proposed mine that need to be included in an in-combination assessment. The NuGen Moorside development is currently on hold, and timescales, the nature and scope of the project, and its potential impacts are unknown. Therefore, no cumulative impact assessment is provided for this development.</p> <p>It is concluded that there will be no adverse effect on the integrity of the pSPA (through impacts on the populations of the pSPA qualifying species or</p>		

Solway Firth pSPA – decommissioning phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			through impacts on supporting habitats or species) through this pathway alone or in combination with other plans or projects.		
10	Subsidence effects under the terrestrial environment	Subsidence under the terrestrial environment as a result of sub-surface mining activities	No subsidence is predicted during the decommissioning phase as no mining activity will be taking place and any subsidence will have taken place during the operational phase of the development. Please see paragraphs 6.187 et seq in Chapter 6, which provides an assessment of the effects of subsidence.	Yes	Yes
11	Subsidence effects under the marine environment	Subsidence under the marine environment as a result of sub-surface mining activities	No subsidence is predicted during the decommissioning phase as no mining activity will be taking place and any subsidence will have taken place during the operational phase of the development. Please see paragraphs 6.187 et seq in Chapter 6, which provides an assessment of the effects of subsidence.	Yes	Yes

River Ehen SAC

- 7.15 The qualifying features of the River Ehen SAC are as follows:
- 7.16 The River Ehen is designated a SAC because it supports internationally important populations of the following Annex II species, which is a primary reason for selection of this site: Freshwater pearl mussel *Margaritifera margaritifera*.
- 7.17 The River Ehen also supports a population of the following Annex II species, which is not a primary reason for site selection: Atlantic salmon *Salmo salar*.
- 7.18 The conservation objectives for the River Ehen SAC are as follows:
- Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring;
 - The extent and distribution of the habitats of qualifying species;
 - The structure and function of the habitats of qualifying species;
 - The supporting processes on which the habitats of qualifying species rely;
 - The populations of qualifying species; and
 - The distribution of qualifying species within the site.

Construction Phase

Table 5: Impact mechanisms and pathways during the construction phase of the development – River Ehen SAC

River Ehen SAC – construction phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
1	Direct loss of or damage to terrestrial habitat – MMS, RLF/UC	Potential loss of terrestrial supporting habitat for SAC qualifying features through land-take	The interest features of the R Ehen SAC are aquatic hence there is no impact pathway from loss of or damage to terrestrial habitat. Please see paragraphs 6.8 et seq in Chapter 6, which provide a detailed assessment.	Yes	Yes
2	Disturbance of marine or terrestrial qualifying species (visual/noise/vibration) – MMS/RLF/UC/UM/	Potential for disruption and/or injury to migratory fish through noise/vibration as a result of construction processes e.g. piling/drilling	<u>Visual / human disturbance</u> The interest features of the R Ehen SAC are aquatic hence this impact pathway is not relevant. Please see paragraphs 6.27 et seq in Chapter 6, which provides a detailed assessment. <u>Noise and vibration</u> There is no mechanism by which construction related noise and vibration can impact on the River Ehen SAC. The nearest part of the River Ehen SAC is 3 km to the east of the site and the point at which it discharges to the sea is more than 11 km to the south of the site. This is well beyond the limits of any noise and vibration effects. There will be no construction related noise and vibration related impacts on marine receptors as no offshore works or mining activities will take place in this phase.	Yes	Yes

River Ehen SAC – construction phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			Please see paragraphs 6.31 et seq in Chapter 6, which provides a detailed assessment.		
3	Direct loss of or damage to marine habitat or disturbance to marine species from scouring and/or sedimentation from any discharges from the existing discharge pipe into Saltom Bay	Potential effect on migratory fish populations through: Deterioration of food resource; Reduction in prey availability	<p>The proposed development will not impact directly on any part of the River Ehen SAC; however, impacts on marine habitat or disturbance to marine species from scouring and/or sedimentation are possible as a result of discharges of surface water made through the existing sea outfall pipe.</p> <p>Whilst the River Ehen is 3 km to the east of the site, the point at which it discharges to the sea is more than 11 km to the south of the site. This is sufficiently distant from the sea outfall pipe at Saltom Bay that scour / sedimentation related impacts on fish migration linked to the SAC are not expected (Chapter 17 Marine Environment, Environmental Statement, paragraph 17.29.19, West Cumbria Mining, 2018).</p> <p>During the remediation of the development site no surface water discharge is likely as areas being worked will be covered to prevent rainwater ingress (where necessary), which will prevent surface water drainage from these areas. For other parts of the site there will be a state of no change (Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, Flood Risk Assessment and Drainage Strategy, section 6.1.4.1, Environmental Statement, West Cumbria Mining, 2018; Chapter 17 Marine Environment, Environmental Statement, section 17.29.6 et seq, West Cumbria Mining, 2018). Consequently, during the remediation of the site there is no mechanism by which scouring or sedimentation impacts on the marine environment could occur.</p>	Yes	Yes

River Ehen SAC – construction phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>During the remaining part of the construction phase, excess surface water runoff will need to be discharged to sea via the existing outfall in Saltom Bay. In periods of heavy rainfall, flows will be attenuated on site through storage (Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, Flood Risk Assessment and Drainage Strategy, section 6.1.4.2 et seq, Environmental Statement, West Cumbria Mining, 2018).</p> <p>However, following heavy rainfall excess surface water runoff will need to be discharged to sea via the existing outfall in Saltom Bay. The discharge pipe runs down the foreshore and terminates in the intertidal zone (it is only fully exposed around low water springs tides).</p> <p>In order to minimise potential scour, the maximum flow rate of the discharge will be limited to 25 l/s, which will only be reached during and following heavy rainfall events. The proposed development will minimise the potential for scour on the intertidal area around the outfall by limiting, wherever practicable, surface water discharge to when the outlet point is submerged. By only discharging surface water when the outlet point is submerged, the potential for scour at the proposed flow rates will be minimised (Chapter 17 Marine Environment, Environmental Statement, section 17.29.10, West Cumbria Mining, 2018).</p> <p>When the discharge point is exposed (i.e. not submerged), modelling results indicate that the proposed flow rate would be sufficient to mobilise fine sand material (i.e. no significant sediment re-suspension is likely (Chapter 17 Marine Environment, Environmental Statement,</p>		

River Ehen SAC – construction phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>section 17.29.8, West Cumbria Mining, 2018). However, the sediments at the discharge point location consist of coarse sands (and cobbles and boulders), and so any re-suspended particles are likely to settle out very quickly. It is concluded that any effect on water quality and biota will be localised and of minor significance (Chapter 17 Marine Environment, Environmental Statement, section 17.29.9, West Cumbria Mining, 2018).</p> <p>Modelling work has concluded that the Zone of Influence of the discharge into the sea, when combined with the existing leachate discharge, is 162m from the outfall, which means that the River Ehen SAC (which discharges to the sea at a point more than 11 km to the south of the site) and its qualifying features will not be directly impacted (Chapter 17 Marine Environment, Environmental Statement, section 17.34.7 et seq, West Cumbria Mining, 2018). Consequently, as the proposed discharge is not expected to have a significant effect on marine fauna, no significant effect is expected in respect of salmon (the only qualifying feature of the SAC that uses the marine environment) using the River Ehen estuary, which is 11 km to the south. Similarly, there will be no significant indirect impacts on SAC qualifying features as a result of impacts on prey species.</p> <p>As such, an in-combination effect with other plans or projects is considered very unlikely, however, to ensure a comprehensive assessment, other discharges from other plans and projects have also been considered (if they include a proposed discharge to sea which could combine with the 162m zone of influence from the Saltom Bay outfall - Chapter 17 Marine Environment, Environmental Statement, sections 17.34.1 to 17.34.5, West Cumbria Mining, 2018).</p>		

River Ehen SAC – construction phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>The zone of influence (ZOI) of the proposed surface water runoff discharge to Saltom Bay has been calculated as approximately 162 m and is over 8 km (by sea) from the mouth of Pow Beck. Hence no in-combination effect is predicted between the two sources of surface water runoff associated with the proposed development. The following licensable discharges to sea are within the vicinity of Saltom Bay and have the potential to interact with the surface water runoff discharges from the Saltom Bay outfall associated with the proposed development (Chapter 17 , paragraph 17.34, of the Environmental Statement):</p> <p>A private sewer discharge outfall is located approximately 350 m from the proposed WCM discharge point and it is permitted to discharge no more than 0.2 m³ per day. The permit associated with this discharge states that the discharge must have no adverse visible effect on the receiving environment. Modelling shows that the private sewer discharge from a pharmacy in Kells (to Saltom Bay) is outside the zone of influence for the WCM discharge (Chapter 17 Marine Environment, paragraph 17.34.7, Environmental Statement, 2018). This is the case even when the outfall is fully exposed at low tide. Due to the separation distance and the very small volume of this discharge, a significant in-combination effect is not predicted to occur (Chapter 17 Marine Environment, paragraph 17.34.8, Environmental Statement, 2018).</p> <p>A United Utilities pumping station discharge (to Saltom Bay) is also outside the zone of influence for the WCM discharge (Chapter 17 Marine Environment, paragraph 17.34.7, Environmental Statement, 2018). The pumping station may only discharge to sea in emergency</p>		

River Ehen SAC – construction phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>circumstances when the pumping station is inoperative. No discharge occurs under normal circumstances. Due to the operational restrictions on this outfall, a significant in-combination effect is not predicted (Chapter 17 Marine Environment, paragraph 17.34.9, Environmental Statement, 2018).</p> <p>The Sellafield outfalls extend ~2.1 km from shore into the north-eastern Irish Sea and are located approximately 14.5 km directly south of the Saltom Bay discharge point (~17 km by sea). The Sellafield discharge outfall (at Seascale) is therefore also outside the zone of influence for the WCM discharge (Chapter 17 Marine Environment, paragraph 17.34.7, Environmental Statement, 2018). An in-combination effect is not predicted to occur due to the separation distance (Chapter 17 Marine Environment, paragraph 17.34.11, Environmental Statement, 2018).</p> <p>The United Utilities wastewater treatment works discharge (at Parton, north of Whitehaven) is located approximately 5 km from the proposed discharge point in Saltom Bay. The discharge point of this outfall is therefore also outside the zone of influence for the WCM discharge (Chapter 17 Marine Environment, paragraph 17.34.7, Environmental Statement, 2018). Furthermore, the existing sewage discharge is discharged via diffuser(s) at a distance of ~1.9 km from shore, in the main current flows of the Solway Firth, and has an initial dilution factor of 50, which is generally considered appropriate for secondary treated sewage effluent. The United Utilities wastewater treatment works discharge is therefore considered to have sufficient initial and secondary mixing to ensure that it will not produce cumulative or in-combination impacts with the Saltom Bay discharge. (Chapter 17 Marine Environment, paragraph 17.34.10, Environmental</p>		

River Ehen SAC – construction phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>Statement, 2018).</p> <p>There are no other projects which CCC is aware of in the marine environment in the proximity of the proposed mine that need to be included in an in-combination assessment. The NuGen Moorside development is currently on hold, and timescales, the nature and scope of the project, and its potential impacts are unknown. Therefore, no cumulative impact assessment is provided for this development.</p> <p>It is therefore concluded that the discharge will not have a significant effect on the marine environment, either alone or in combination with other discharges from other plans or projects (Chapter 17 Marine Environment, Environmental Statement, sections 17.29.8 to 17.29.11 and 17.34.7, West Cumbria Mining, 2018).</p> <p>It is concluded that there will be no adverse effect on the integrity of the SAC (through impacts on the populations of the SAC qualifying species or through impacts on supporting habitats or species) through this pathway alone or in combination with other plans or projects.</p>		
4	Direct loss of or damage to marine habitat or disturbance to marine species from scouring and/or sedimentation	<p>Potential effect on migratory fish populations through:</p> <p>Deterioration of food resource;</p> <p>Reduction in prey</p>	<p>The proposed development will not impact directly on any part of the River Ehen SAC; however, impacts on marine habitat or disturbance to marine species from scouring and/or sedimentation are possible at the point where Pow Beck discharges to the sea to the south of St Bees (approximately 2.8 km downstream of the development), as a result of the discharge of surface water made to connected watercourses from the conveyor and RLF.</p> <p>Surface water flows, if uncontrolled, have the potential to entrain</p>	Yes	Yes

River Ehen SAC – construction phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
	from any discharges via Pow Beck	availability	<p>sediments and contaminants generated by the construction of the proposed development, which may have negative impacts on marine water quality and marine biota. In addition, the flows themselves, if increased, will have the potential to cause scouring around the mouth of Pow Beck.</p> <p>Whilst the River Ehen is 3 km to the east of the site, the point at which it discharges to the sea is more than 9 km to the south of the Pow Beck. This is sufficiently distant from the Pow Beck that scour / sedimentation related impacts on fish migration linked to the SAC are not likely (Chapter 17 Marine Environment, Environmental Statement, paragraph 17.29.19, West Cumbria Mining, 2018). However, this assessment takes a highly precautionary approach, and assumes that there may be a potential for scouring and/or sedimentation to impact migratory salmon (a qualifying feature of the SAC).</p> <p>In order to minimise potential scour, discharge and control measures will be adopted at the conveyor and rail loading facility sites (Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, sections 6.2 and 6.3, Flood Risk Assessment and Drainage Strategy, Environmental Statement, West Cumbria Mining, 2018; Sections 5.7 and 5.10 of the Draft Environmental Management Plan - Appendix E to Chapter 5 Project Description, Environmental Statement, West Cumbria Mining, 2018).</p> <p>Bellhouse Gill and an unnamed tributary of the Pow Beck (both ephemeral watercourses) are intersected by the conveyor route. The conveyor will be buried beneath these two ephemeral watercourses. During the construction phase, the watercourses will be diverted around the construction area. There will therefore be no increases in flow rates or discharge volumes to Pow Beck, and hence no impacts</p>		

River Ehen SAC – construction phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>at St Bees beach due to scour are predicted.</p> <p>During the construction phase, surface water runoff at the rail loading facility (RLF) site will be retained on-site in attenuation lagoons. Surface discharges to Pow Beck will be at a reduced rate compared to the current greenfield runoff rates. Consequently, impacts associated with scour at the mouth of the Pow Beck at St Bees beach are not predicted to occur (Chapter 17 Marine Environment, Environmental Statement, sections 17.29.20 to 17.29.23, West Cumbria Mining, 2018).</p> <p>It is concluded that there will be no adverse effect on the integrity of the SAC (through impacts on the populations of the SAC qualifying species or through impacts on supporting habitats or species) through this pathway alone or in combination with other plans or projects</p> <p>In relation to the risk of scouring there is predicted to be no impact at the point where the Pow Beck discharges to the sea from WCM's project and so no risk of any in combination impact.</p>		
5	Dust and other airborne contamination of marine and terrestrial habitats – MMS/RLF/UC	<p>Potential effect on migratory fish populations through:</p> <p>Deterioration of food resource;</p> <p>Reduction in prey availability</p>	<p>Please see paragraphs 6.131 et seq in Chapter 6, which provide a detailed assessment of the effects of dust.</p> <p>Please see paragraphs 6.135 et seq in Chapter 6, which provide a detailed assessment of the effects of NOx.</p> <p>Please see paragraphs 6.139 et seq in Chapter 6, which provide a detailed assessment of the effects of N deposition.</p>	Yes	Yes

River Ehen SAC – construction phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			It is important to note that the analysis of air quality impacts presented in the above sections represents, as is legally required, a cumulative assessment of the proposed development (i.e. in combination with other plans and projects). This covers dust, traffic, and other operational controlled emissions and is explained in detail in the air quality assessment (Chapter 15 Air Quality, section 15.7, paragraph 15.7.1 - 15.7.4 [dust], paragraph 15.7.5 – 15.7.10 [traffic], paragraph 15.7.11 – 15.7.12 [controlled emissions], Environmental Statement, 2018).		
6	Deterioration of marine water quality as a result of sediment-laden surface water run-off during remediation and construction – via the Saltom Bay outfall	Potential effect on SAC migratory fish populations including impacts on prey availability and deterioration of food resource through: Escape of sediment-entrained surface water during construction works.	The proposed development will not impact directly on any part of the River Ehen SAC; however, impacts on marine habitat or disturbance to marine species from sediment-laden surface water are possible as a result of discharges of surface water made through the existing sea outfall pipe. Whilst the River Ehen is 3 km to the east of the site, the point at which it discharges to the sea is more than 11 km to the south of the site. This is sufficiently distant from the sea outfall pipe at Saltom Bay that water quality related impacts on fish migration linked to the SAC (salmon is the only qualifying feature that uses the marine environment) are not expected and in any event the surface water will be treated prior to discharge. Prior to the main construction period it is planned that a 6 month remediation phase will be required to treat pockets of contamination which may remain in areas of the site. During the remediation works, working areas will be fully covered to prevent rainwater ingress. This will ensure that no sediment is mobilised or transported by surface	Yes	Yes

River Ehen SAC – construction phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>water. Areas of the site which are not being remediated will continue to drain as they do currently (Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, Flood Risk Assessment and Drainage Strategy, Section 6.1.4.1, Environmental Statement, West Cumbria Mining, 2018).</p> <p>Consequently no significant effects from sediment-laden surface water are expected on the marine environment during this remediation phase (Chapter 17 Marine Environment, paragraph 17.29.6, Environmental Statement, West Cumbria Mining, 2018).</p> <p>In the absence of mitigation the release of sediment-laden surface water into the marine environment could potentially impact on SAC qualifying features directly (if they are present in the vicinity of the discharge pipe), for example as a result of habitat deterioration due to sediment-laden water, or indirectly, by impacting on the prey species that SAC qualifying features depend upon.</p> <p>However, the effects of suspended solids on the marine environment will be fully mitigated during the construction phase of the development through best practice measures that will be adopted by the appointed contractor. Temporary settlement lagoons will be installed to collect surface water prior to discharge to remove potential suspended solids and ensure that discharge permit levels are met (Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, Flood Risk Assessment and Drainage Strategy, Section 6.1.4.2, Environmental Statement, West Cumbria Mining, 2018). Water which has passed through oil and silt traps will be discharged using the existing outfall. Control measures including standard construction site environmental management (Sections 5.7 and 5.10 of the Draft</p>		

River Ehen SAC – construction phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>Environmental Management Plan - Appendix E to Chapter 5 Project Description, Environmental Statement, West Cumbria Mining, 2018) will be implemented.</p> <p>Discharges during the construction phase will be temporary in nature, i.e. they will only occur for the duration of the construction period, which is expected to be about 2 years, and at times when rainfall cannot be used in the construction processes (for example concrete mixing, damping down of roads and stockpiles etc).</p> <p>Modelling work has concluded that the Zone of Influence of the discharge into the sea, when combined with the existing leachate discharge, is 162m from the outfall, which means that the River Ehen SAC (which discharges to the sea at a point more than 11 km to the south of the site) and its qualifying features will not be directly impacted (Chapter 17 Marine Environment, Environmental Statement, section 17.34.7 et seq, West Cumbria Mining, 2018). The discharge will be at a maximum flow rate of 25 l/s (Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, Flood Risk Assessment and Drainage Strategy, section 6.1.4.2 et seq, Environmental Statement, West Cumbria Mining, 2018). As the proposed discharge is not expected to have a significant effect on marine fauna, no indirect impacts on SAC qualifying features are expected either, e.g. as a result of impacts on prey species.</p> <p>The proposed mitigation measures and the maximum discharge rate (together with rapid mixing and dispersal in the marine environment) will ensure that the effects of the discharge are limited in their extent. No significant effects are likely on the marine environment (Chapter 17 Marine Environment, paragraph 17.29.8 to 17.29.11, Environmental Statement, West Cumbria Mining, 2018), indeed any</p>		

River Ehen SAC – construction phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>such impact is regarded as negligible. Consequently it is not expected that the discharge of sediment laden surface water will impact directly or indirectly on salmon (the only qualifying feature of the SAC that uses the marine environment) using the River Ehen estuary, which is 11 km to the south.</p> <p>The hydrological assessment has concluded that, with respect to groundwater and surface water, no pathway is considered to exist between the proposed development and any other proposed development (Chapter 12 Hydrology & Hydrogeology, Section 12.8, Environmental Statement, West Cumbria Mining, 2018).</p> <p>As such, an in-combination effect with other plans or projects is considered very unlikely, however, to ensure a comprehensive assessment, other discharges from other plans and projects have also been considered (if they include a proposed discharge to sea which could combine with the 162m zone of influence from the Saltom Bay outfall) (Chapter 17 Marine Environment, Environmental Statement, section 17.34.1 et seq, West Cumbria Mining, 2018) .</p> <p>The zone of influence (ZOI) of the proposed surface water runoff discharge to Saltom Bay has been calculated as approximately 162 m and is over 8 km (by sea) from the mouth of Pow Beck. Hence no in-combination effect is predicted between the two sources of surface water runoff associated with the proposed development.</p> <p>The following licensable discharges to sea are within the vicinity of Saltom Bay and have the potential to interact with the surface water runoff discharges from the Saltom Bay outfall associated with the proposed development (Chapter 17 , paragraph 17.34, of the</p>		

River Ehen SAC – construction phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>Environmental Statement):</p> <p>A private sewer discharge outfall is located approximately 350 m from the proposed WCM discharge point and it is permitted to discharge no more than 0.2 m³ per day. The permit associated with this discharge states that the discharge must have no adverse visible effect on the receiving environment. Modelling shows that the private sewer discharge from a pharmacy in Kells (to Saltom Bay) is outside the zone of influence for the WCM discharge (Chapter 17 Marine Environment, paragraph 17.34.7, Environmental Statement, 2018). This is the case even when the outfall is fully exposed at low tide. Due to the separation distance and the very small volume of this discharge, a significant in-combination effect is not predicted to occur (Chapter 17 Marine Environment, paragraph 17.34.8, Environmental Statement, 2018).</p> <p>A United Utilities pumping station discharge (to Saltom Bay) is also outside the zone of influence for the WCM discharge (Chapter 17 Marine Environment, paragraph 17.34.7, Environmental Statement, 2018). The pumping station may only discharge to sea in emergency circumstances when the pumping station is inoperative. No discharge occurs under normal circumstances. Due to the operational restrictions on this outfall, a significant in-combination effect is not predicted (Chapter 17 Marine Environment, paragraph 17.34.9, Environmental Statement, 2018).</p> <p>The Sellafield outfalls extend ~2.1 km from shore into the north-eastern Irish Sea and are located approximately 14.5 km directly south of the Saltom Bay discharge point (~17 km by sea). The Sellafield discharge outfall (at Seascale) is therefore also outside the</p>		

River Ehen SAC – construction phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>zone of influence for the WCM discharge (Chapter 17 Marine Environment, paragraph 17.34.7, Environmental Statement, 2018). An in-combination effect is not predicted to occur due to the separation distance (Chapter 17 Marine Environment, paragraph 17.34.11, Environmental Statement, 2018).</p> <p>The United Utilities wastewater treatment works discharge (at Parton, north of Whitehaven) is located approximately 5 km from the proposed discharge point in Saltom Bay. The discharge point of this outfall is therefore also outside the zone of influence for the WCM discharge (Chapter 17 Marine Environment, paragraph 17.34.7, Environmental Statement, 2018). Furthermore, the existing sewage discharge is discharged via diffuser(s) at a distance of ~1.9 km from shore, in the main current flows of the Solway Firth, and has an initial dilution factor of 50, which is generally considered appropriate for secondary treated sewage effluent. The United Utilities wastewater treatment works discharge is therefore considered to have sufficient initial and secondary mixing to ensure that it will not produce cumulative or in-combination impacts with the Saltom Bay discharge. (Chapter 17 Marine Environment, paragraph 17.34.10, Environmental Statement, 2018).</p> <p>There are no other projects which CCC is aware of in the marine environment in the proximity of the proposed mine that need to be included in an in-combination assessment. The NuGen Moorside development is currently on hold, and timescales, the nature and scope of the project, and its potential impacts are unknown. Therefore, no cumulative impact assessment is provided for this development.</p> <p>It is therefore concluded that the discharge will not have a significant</p>		

River Ehen SAC – construction phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>effect on the marine environment, either alone or in combination with other discharges from other plans or projects (Chapter 17 Marine Environment, Environmental Statement, sections 17.29.8 to 17.29.11 and 17.34.7, West Cumbria Mining, 2018).</p> <p>It is concluded that there will be no adverse effect on the integrity of the SAC (through impacts on the populations of the SAC qualifying species or through impacts on supporting habitats or species) through this pathway alone or in combination with other plans or projects.</p>		
7	Deterioration of marine water quality as a result of disturbance of contaminated land and mobilisation of pollutants during construction (including remediation works) on brownfield land (including changes in pH, temperature, salinity, and dissolved oxygen)	<p>Potential effect on SAC migratory fish populations including impacts on prey availability and deterioration of food resource through:</p> <p>Mobilisation of underground contaminants disturbed during remediation works</p> <p>Potential for pollution incidents from spillages, leakages etc from stored chemicals, fuel and oils on site.</p>	<p>The proposed development will not impact directly on any part of the River Ehen SAC; however, impacts on marine water quality are possible as a result of discharges of surface water made through the existing sea outfall pipe.</p> <p>Whilst the River Ehen is 3 km to the east of the site, the point at which it discharges to the sea is more than 11 km to the south of the site. This is sufficiently distant from the Saltom Bay outfall that water quality related impacts on fish migration linked to the SAC (salmon is the only qualifying feature that uses the marine environment) are not expected. In addition the surface water will be treated prior to discharge.</p> <p>Prior to the main construction period it is planned that a 6 month remediation phase will be required to treat pockets of contamination which may remain in areas of the site.</p> <p>In the absence of mitigation the potential release of pollutants into the marine environment could potentially impact on SAC qualifying features directly (if they are present in the vicinity of the discharge</p>	Yes	Yes

River Ehen SAC – construction phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
	discharged via Saltom Bay outfall		<p>pipe), for example as a result of toxic effects, or indirectly, by impacting on the prey species or habitats that SAC qualifying features depend upon.</p> <p>There are potential impacts associated with the discharge and these are related to non-toxic inputs. These include the effects of pH, temperature, salinity and dissolved oxygen. The marine assessment has concluded that the proposed discharge of surface water into the marine environment is not likely to have a significant effect on pH, salinity, water temperature of dissolved oxygen (Chapter 17 Marine Environment, Environmental Statement, West Cumbria Mining, 2018, paragraphs 17.29.12 [pH], 17.29.14-.17 [salinity], 17.29.13 [water temperature], 17.29.18 [dissolved oxygen]). As previously noted the Zone of Influence of the discharge into the sea, when combined with the existing leachate discharge, is 162m from the outfall.</p> <p>Pollution effects during the construction phase of the development (including remediation works) will be fully mitigated through best practice measures that will be adopted by the appointed contractor. This includes the collection and settlement of surface water and the adoption of best practice pollution prevention measures (Draft Environmental Management Plan - Appendix E to Chapter 5 Project Description, Sections 5.7 and 5.10, Environmental Statement, West Cumbria Mining, 2018).</p> <p>During the remediation works, working areas will be fully covered to prevent rainwater ingress. This will ensure that no contaminants are mobilised or transported by surface water. Areas of the site which are not being remediated will continue to drain as they do currently (Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, Flood Risk</p>		

River Ehen SAC – construction phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>Assessment and Drainage Strategy, Section 6.1.4.1, Environmental Statement, West Cumbria Mining, 2018).</p> <p>Once the remediation phase is complete, there will be no legacy contaminants on site. Consequently there will be no mechanism whereby legacy contaminants could be discharged into the marine environment.</p> <p>Discharges during the construction phase will be temporary in nature, i.e. they will only occur for the duration of the construction period, which is expected to be about 2 years, and at times when rainfall cannot be used in the construction processes (for example concrete mixing, damping down of roads and stockpiles etc).</p> <p>Modelling work has concluded that the Zone of Influence of the discharge into the sea, when combined with the existing leachate discharge, is 162m from the outfall, which means that the River Ehen SAC (which discharges to the sea at a point more than 11 km to the south of the site) and its qualifying features will not be directly impacted (Chapter 17 Marine Environment, Environmental Statement, section 17.34.7 et seq, West Cumbria Mining, 2018). The discharge will be at a maximum flow rate of 25 l/s (Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, Flood Risk Assessment and Drainage Strategy, section 6.1.4.2 et seq, Environmental Statement, West Cumbria Mining, 2018). As the proposed discharge is not expected to have a significant effect on marine fauna, no indirect impacts on SAC qualifying features are expected either, e.g. as a result of impacts on prey species.</p> <p>The proposed mitigation measures and the maximum discharge rate</p>		

River Ehen SAC – construction phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>(together with rapid mixing and dispersal in the marine environment) will ensure that the effects of the discharge are limited in their extent. No significant effects are likely on the marine environment (Chapter 17 Marine Environment, paragraph 17.29.12 – 17.29.18, Environmental Statement, West Cumbria Mining, 2018) indeed any such impact is regarded as negligible.</p> <p>Consequently it is not expected that the discharge of pollutants (including changes in pH, temperature, salinity, and dissolved oxygen) will impact directly or indirectly on salmon (the only qualifying feature of the SAC that uses the marine environment) using the River Ehen estuary, which is 11 km to the south. The hydrological assessment has concluded that, with respect to groundwater and surface water, no pathway is considered to exist between the proposed development and any other proposed development (Chapter 12 Hydrology & Hydrogeology, Section 12.8, Environmental Statement, West Cumbria Mining, 2018).</p> <p>As such, an in-combination effect with other plans or projects is considered very unlikely, however, to ensure a comprehensive assessment, other discharges from other plans and projects have also been considered (if they include a proposed discharge to sea which could combine with the 162m zone of influence from the Saltom Bay outfall) (Chapter 17 Marine Environment, Environmental Statement, section 17.34.1 et seq, West Cumbria Mining, 2018).</p> <p>The zone of influence (ZOI) of the proposed surface water runoff discharge to Saltom Bay has been calculated as approximately 162 m and is over 8 km (by sea) from the mouth of Pow Beck. Hence no in-combination effect is predicted between the two sources of surface</p>		

River Ehen SAC – construction phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>water runoff associated with the proposed development. The following licensable discharges to sea are within the vicinity of Saltom Bay and have the potential to interact with the surface water runoff discharges from the Saltom Bay outfall associated with the proposed development (Chapter 17 , paragraph 17.34, of the Environmental Statement):</p> <p>A private sewer discharge outfall is located approximately 350 m from the proposed WCM discharge point and it is permitted to discharge no more than 0.2 m³ per day. The permit associated with this discharge states that the discharge must have no adverse visible effect on the receiving environment. Modelling shows that the private sewer discharge from a pharmacy in Kells (to Saltom Bay) is outside the zone of influence for the WCM discharge (Chapter 17 Marine Environment, paragraph 17.34.7, Environmental Statement, 2018). This is the case even when the outfall is fully exposed at low tide. Due to the separation distance and the very small volume of this discharge, a significant in-combination effect is not predicted to occur (Chapter 17 Marine Environment, paragraph 17.34.8, Environmental Statement, 2018).</p> <p>A United Utilities pumping station discharge (to Saltom Bay) is also outside the zone of influence for the WCM discharge (Chapter 17 Marine Environment, paragraph 17.34.7, Environmental Statement, 2018). The pumping station may only discharge to sea in emergency circumstances when the pumping station is inoperative. No discharge occurs under normal circumstances. Due to the operational restrictions on this outfall, a significant in-combination effect is not predicted (Chapter 17 Marine Environment, paragraph 17.34.9, Environmental Statement, 2018).</p>		

River Ehen SAC – construction phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>The Sellafield outfalls extend ~2.1 km from shore into the north-eastern Irish Sea and are located approximately 14.5 km directly south of the Saltom Bay discharge point (~17 km by sea). The Sellafield discharge outfall (at Seascale) is therefore also outside the zone of influence for the WCM discharge (Chapter 17 Marine Environment, paragraph 17.34.7, Environmental Statement, 2018). An in-combination effect is not predicted to occur due to the separation distance (Chapter 17 Marine Environment, paragraph 17.34.11, Environmental Statement, 2018).</p> <p>The United Utilities wastewater treatment works discharge (at Parton, north of Whitehaven) is located approximately 5 km from the proposed discharge point in Saltom Bay. The discharge point of this outfall is therefore also outside the zone of influence for the WCM discharge (Chapter 17 Marine Environment, paragraph 17.34.7, Environmental Statement, 2018). Furthermore, the existing sewage discharge is discharged via diffuser(s) at a distance of ~1.9 km from shore, in the main current flows of the Solway Firth, and has an initial dilution factor of 50, which is generally considered appropriate for secondary treated sewage effluent. The United Utilities wastewater treatment works discharge is therefore considered to have sufficient initial and secondary mixing to ensure that it will not produce cumulative or in-combination impacts with the Saltom Bay discharge. (Chapter 17 Marine Environment, paragraph 17.34.10, Environmental Statement, 2018).</p> <p>There are no other projects which CCC is aware of in the marine environment in the proximity of the proposed mine that need to be included in an in-combination assessment. The NuGen Moorside</p>		

River Ehen SAC – construction phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>development is currently on hold, and timescales, the nature and scope of the project, and its potential impacts are unknown. Therefore, no cumulative impact assessment is provided for this development.</p> <p>It is concluded that there will be no adverse effect on the integrity of the SAC (through impacts on the populations of the SAC qualifying species or through impacts on supporting habitats or species) through this pathway alone or in combination with other plans or projects.</p>		
8	Deterioration of marine water quality as a result of sediment-laden surface water run-off during construction, via Pow Beck catchment	<p>Potential effect on SAC migratory fish populations including impacts on prey availability and deterioration of food resource through:</p> <p>Construction site surface water discharge and run-off</p>	<p>The proposed development will not impact directly on any part of the River Ehen SAC; however, impacts on marine water quality are possible as a result of discharges of surface water made from the RLF and Conveyor to the Bellhouse Gill and Pow Beck, which eventually discharges to the sea to the south of St Bees approximately 2.8 km downstream of the development.</p> <p>Whilst the River Ehen is 3 km to the east of the site, the point at which it discharges to the sea via Pow Beck is more than 9 km to the south of the Pow Beck. This is sufficiently distant that water quality related impacts on fish migration linked to the SAC (salmon is the only qualifying feature that uses the marine environment) are not expected and in any event the surface water will be treated prior to discharge.</p> <p>In the absence of mitigation the release of sediment-laden surface water via the Pow Beck into the marine environment could potentially impact on SAC qualifying features directly (if they are present in the vicinity of the Pow Beck where it discharges to sea), for example as a result habitat deterioration due to sediment-laden water or indirectly</p>	Yes	Yes

River Ehen SAC – construction phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>by impacting on the prey species that SAC qualifying features depend upon.</p> <p>The effects of suspended solids (transported via the Pow Beck) on the marine environment will be fully mitigated through measures that will be adopted during the construction phase of the development. This includes the collection and treatment of surface water by settlement and the adoption of best practice pollution prevention measures (Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, section 6.2.1.1, Flood Risk Assessment and Drainage Strategy, Environmental Statement, West Cumbria Mining, 2018; Chapter 5 Project Description, Appendix E, Draft Environmental Management Plan, sections 5.6 and 5.7).</p> <p>Details of the discharge and control measures at the conveyor and rail loading facility sites are described in Chapter 12 Hydrology & Hydrogeology, Appendix 12-7, Flood Risk Assessment and Drainage Strategy, Sections 6.2 and 6.3, Environmental Statement, West Cumbria Mining, 2018.</p> <p>Bellhouse Gill and an unnamed tributary of the Pow Beck (both ephemeral watercourses) are intersected by the conveyor route. The conveyor will be buried beneath these ephemeral watercourses. Following construction, the flow regime at these locations will return to pre-development conditions.</p> <p>During the construction phase, the watercourses will be diverted around the construction area to allow for the continuation of flow over this time. There will therefore be no increases in flow rates or discharge volumes to Pow Beck. Water pollution controls at the</p>		

River Ehen SAC – construction phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>conveyor site will avoid/minimise sediment release to Pow Beck and hence the marine environment.</p> <p>It is proposed to create a temporary lagoon for the storage and settlement of surface water from the Conveyor and Rail Loading Facility during the construction phase (Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, Flood Risk Assessment and Drainage Strategy, Table 6.1, Environmental Statement, West Cumbria Mining, 2018).</p> <p>Dilution effects within Bellhouse Gill and Pow Beck will also reduce the environmental concentrations of any contaminants present (though this is considered unlikely once good practice measures are in place) to the point where they are not predicted to have any significant impact on the marine environment (Chapter 17 Marine Environment, paragraph 17.29.21 – 17.29.23, Environmental Statement, West Cumbria Mining, 2018).</p> <p>Furthermore, discharges during the construction phase will be temporary in nature, i.e. they will only occur for the duration of the construction period, which is expected to be about 2 years, and at times when rainfall cannot be used in the construction processes (for example concrete mixing, damping down of roads and stockpiles etc).</p> <p>The mitigation measures (together with rapid mixing and dispersal in the marine environment) will ensure that the effects of the discharge are limited in their extent. No significant pollution impact on the marine environment is predicted via the Pow Beck pathway (Chapter 17 Marine Environment, paragraph 17.29.23, Environmental Statement, West Cumbria Mining, 2018), indeed any such impact is</p>		

River Ehen SAC – construction phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>regarded as negligible.</p> <p>Consequently it is not expected that there will be discharge of any sediment laden surface water from the RLF and Conveyor to the Pow Beck, which eventually discharges to the sea and that will impact directly or indirectly on salmon (the only qualifying feature of the SAC that uses the marine environment) using the River Ehen estuary, which is 9 km to the south, and whilst migrating at sea.</p> <p>The hydrological assessment has concluded that, with respect to groundwater and surface water, no pathway is considered to exist between the proposed development and any other proposed development (Chapter 12 Hydrology & Hydrogeology, Section 12.8, Environmental Statement, West Cumbria Mining, 2018). As such an in-combination effect with other plans or projects is considered very unlikely, however, to ensure a comprehensive assessment, nearby licensable discharges to sea in the vicinity of the mouth of Pow Beck have nevertheless been investigated.</p> <p>The zone of influence (ZOI) of the proposed surface water runoff discharge to Saltom Bay has been calculated as approximately 162 m and is over 8 km (by sea) from the mouth of Pow Beck. Hence no in-combination effect is predicted between the two sources of surface water runoff associated with the proposed development.</p> <p>The closest licensed discharge to the mouth of Pow Beck is a United Utilities pumping station located at Nethertown, which has a permit to discharge to sea (permit no. 017470153) approximately 4 km south of</p>		

River Ehen SAC – construction phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>the mouth of Pow Beck. However, under the conditions of the permit, the pumping station may only discharge to sea in emergency circumstances when the pumping station is inoperative as a result of e.g. electrical failure or rising main failure. No discharge occurs under normal circumstances. For this reason this discharge has been scoped out of the in-combination impact assessment.</p> <p>The United Utilities WwTW located at Braystones, south of Nethertown, discharges to sea via a long sea outfall (permit no. 017470152). The discharge point of this outfall is located approximately 7 km south from the mouth of Pow Beck and hence any combined effect between it and any discharges made via Pow Beck is very unlikely. Furthermore, the existing sewage discharge is discharged via diffuser(s) at a distance of ~2 km from shore and has an initial dilution factor generally considered appropriate for secondary treated sewage effluent. The existing discharge is therefore considered to have sufficient initial and secondary mixing to ensure that it will not produce cumulative or in-combination impacts with other discharges.</p> <p>The Sellafield outfalls extend ~2.1 km from shore into the north-eastern Irish Sea and are located approximately 8.8 km from the mouth of Pow Beck and hence, again, it is considered highly unlikely that the two plumes will interact. Furthermore, the two discharges are not similar; the proposed discharges to Pow Beck are ambient temperature freshwater which, with good practice guidelines in place, will not be contaminated, while the Sellafield discharge is a cooling water discharge, i.e. warm seawater. There is therefore no realistic likelihood of in-combination effects between the two discharges.</p>		

River Ehen SAC – construction phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>There are no other projects which CCC is aware of in the marine environment in the proximity of the proposed mine that need to be included in an in-combination assessment. The NuGen Moorside development is currently on hold, and timescales, the nature and scope of the project, and its potential impacts are unknown. Therefore, no cumulative impact assessment is provided for this development.</p> <p>It is concluded that there will be no adverse effect on the integrity of the SAC (through impacts on the populations of the SAC qualifying species or through impacts on supporting habitats or species) through this pathway alone or in combination with other plans or projects.</p>		
9	Deterioration of marine water quality as a result of disturbance of contaminated land and mobilisation of pollutants during construction (including remediation works) on brownfield land (including changes in pH,	<p>Potential effect on SAC migratory fish populations including impacts on prey availability and deterioration of food resource through:</p> <p>Mobilisation of underground contaminants disturbed during remediation works</p> <p>Potential for pollution incidents from</p>	<p>The proposed development will not impact directly on any part of the River Ehen SAC; however, impacts on marine water quality are possible as a result of discharges of surface water made from the RLF and Conveyor to the Bellhouse Gill and Pow Beck, which eventually discharges to the sea to the south of St Bees approximately 2.8 km downstream of the development.</p> <p>Whilst the River Ehen is 3 km to the east of the site, the point at which it discharges to the sea via Pow Beck is more than 9 km to the south of the site. This is sufficiently distant that water quality related impacts on fish migration linked to the SAC (salmon is the only qualifying feature that uses the marine environment) are not expected and in any event the surface water will be treated prior to discharge.</p> <p>In the absence of mitigation the release of pollutants into the marine environment could potentially impact on SAC qualifying features</p>	Yes	Yes

River Ehen SAC – construction phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
	temperature, salinity, and dissolved oxygen) discharged via Pow Beck catchment	spillages, leakages etc from stored chemicals, fuel and oils on site.	<p>directly (if they are present in the vicinity of the Pow Beck where it discharges to sea), for example as a result of toxic effects, or indirectly, by impacting on the prey species that SAC qualifying features depend upon.</p> <p>There are potential impacts associated with the discharge and these are related to non-toxic inputs. These include the effects of pH, temperature, salinity and dissolved oxygen.</p> <p>Pollution effects during the construction phase of the development will be fully mitigated through the adoption of best practice pollution prevention measures that will be adopted by the appointed contractor. This includes the collection and settlement of surface water and the adoption of best practice pollution prevention measures (Draft Environmental Management Plan - Appendix E to Chapter 5 Project Description, Sections 5.7 and 5.10, Environmental Statement, West Cumbria Mining, 2018).</p> <p>Details of the discharge and control measures at the conveyor and rail loading facility sites are described in Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, Flood Risk Assessment and Drainage Strategy, Sections 6.2 and 6.3, Environmental Statement, West Cumbria Mining, 2018.</p> <p>Bellhouse Gill and an unnamed tributary of the Pow Beck (both ephemeral watercourses) are intersected by the conveyor route. The conveyor will be buried beneath these ephemeral watercourses; following construction, the flow regime at these locations will return to pre-development conditions.</p>		

River Ehen SAC – construction phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>During the construction phase, the watercourses will be diverted around the construction area to allow for the continuation of flow over this time. There will therefore be no increases in flow rates or discharge volumes to Pow Beck. The conveyor route is enclosed, which will minimise the chance of contamination of local watercourses. Water pollution controls at the conveyor site and RLF, including the use of attenuation lagoons, will avoid/minimise pollutant release to Pow Beck and hence the marine environment.</p> <p>Dilution effects within Bellhouse Gill and Pow Beck will also reduce the environmental concentrations of any contaminants present (though this is considered unlikely once good practice measures are in place) to the point where they are not predicted to have any significant impact on the marine environment (Chapter 17 Marine Environment, paragraph 17.29.21 – 17.29.23, Environmental Statement, West Cumbria Mining, 2018).</p> <p>Furthermore, discharges during the construction phase will be temporary in nature, i.e. they will only occur for the duration of the construction period, which is expected to be about 2 years, and at times when rainfall cannot be used in the construction processes (for example concrete mixing, damping down of roads and stockpiles etc).</p> <p>The mitigation measures (together with rapid mixing and dispersal in the marine environment) will significantly reduce the likelihood of pollution occurring. No significant effects are likely on the marine environment (Chapter 17 Marine Environment, paragraph 17.29. 23, Environmental Statement, West Cumbria Mining, 2018), indeed any such impact is regarded as negligible.</p>		

River Ehen SAC – construction phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>Consequently it is not expected that there will be discharge of pollutants to Pow Beck (including changes in pH, temperature, salinity, and dissolved oxygen) or that any discharges will impact directly or indirectly on salmon (the only qualifying feature of the SAC that uses the marine environment) using the River Ehen estuary, which is 9 km to the south.</p> <p>The hydrological assessment has concluded that, with respect to groundwater and surface water, no pathway is considered to exist between the proposed development and any other proposed development (Chapter 12 Hydrology & Hydrogeology, Section 12.8, Environmental Statement, West Cumbria Mining, 2018).</p> <p>As such an in-combination effect with other plans or projects is considered very unlikely, however, to ensure a comprehensive assessment, nearby licensable discharges to sea in the vicinity of the mouth of Pow Beck have nevertheless been investigated.</p> <p>The zone of influence (ZOI) of the proposed surface water runoff discharge to Saltom Bay has been calculated as approximately 162 m and is over 8 km (by sea) from the mouth of Pow Beck. Hence no in-combination effect is predicted between the two sources of surface water runoff associated with the proposed development.</p> <p>The closest licensed discharge to the mouth of Pow Beck is a United Utilities pumping station located at Nethertown, which has a permit to discharge to sea (permit no. 017470153) approximately 4 km south of the mouth of Pow Beck. However, under the conditions of the permit, the pumping station may only discharge to sea in emergency</p>		

River Ehen SAC – construction phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>circumstances when the pumping station is inoperative as a result of e.g. electrical failure or rising main failure. No discharge occurs under normal circumstances. For this reason this discharge has been scoped out of the in-combination impact assessment.</p> <p>The United Utilities WwTW located at Braystones, south of Nethertown, discharges to sea via a long sea outfall (permit no. 017470152). The discharge point of this outfall is located approximately 7 km south from the mouth of Pow Beck and hence any combined effect between it and any discharges made via Pow Beck is very unlikely. Furthermore, the existing sewage discharge is discharged via diffuser(s) at a distance of ~2 km from shore and has an initial dilution factor generally considered appropriate for secondary treated sewage effluent. The existing discharge is therefore considered to have sufficient initial and secondary mixing to ensure that it will not produce cumulative or in-combination impacts with other discharges.</p> <p>The Sellafield outfalls extend ~2.1 km from shore into the north-eastern Irish Sea and are located approximately 8.8 km from the mouth of Pow Beck and hence, again, it is considered highly unlikely that the two plumes will interact. Furthermore, the two discharges are not similar; the proposed discharges to Pow Beck are ambient temperature freshwater which, with good practice guidelines in place, will not be contaminated, while the Sellafield discharge is a cooling water discharge, i.e. warm seawater. There is therefore no realistic likelihood of in-combination effects between the two discharges.</p> <p>There are no other projects which CCC is aware of in the marine environment in the proximity of the proposed mine that need to be</p>		

River Ehen SAC – construction phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>included in an in-combination assessment. The NuGen Moorside development is currently on hold, and timescales, the nature and scope of the project, and its potential impacts are unknown. Therefore, no cumulative impact assessment is provided for this development.</p> <p>It is concluded that there will be no adverse effect on the integrity of the SAC (through impacts on the populations of the SAC qualifying species or through impacts on supporting habitats or species) through this pathway alone or in combination with other plans or projects.</p>		
10	Subsidence effects under the terrestrial environment	Subsidence under the terrestrial environment as a result of sub-surface mining activities	<p>No subsidence is predicted during the construction phase as no mining activity will have commenced.</p> <p>Please see paragraphs 6.166 et seq in Chapter 6, which provides an assessment of the effects of subsidence.</p>	Yes	Yes
11	Subsidence effects under the marine environment	Subsidence under the marine environment as a result of sub-surface mining activities	<p>No subsidence is predicted during the construction phase as no mining activity will have commenced.</p> <p>Please see paragraphs 6.166 et seq in Chapter 6, which provides an assessment of the effects of subsidence.</p>	Yes	Yes

Operation Phase

Table 6: Impact mechanisms and pathways during the operation phase of the development – River Ehen SAC

River Ehen SAC – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
1	Direct loss of or damage to terrestrial habitat – MMS, RLF/UC	Potential loss of terrestrial supporting habitat for SAC qualifying features through land-take	The interest features of the R Ehen SAC are aquatic hence there is no impact pathway from loss of or damage to terrestrial habitat. Please see paragraphs 6.19 et seq in Chapter 6, which provide a detailed assessment.	Yes	Yes
2	Disturbance of marine or terrestrial qualifying species (visual/noise/vibration) – MMS/RLF/UC/UM	Possible effect on migratory fish populations through mining operations including sub-sea drilling	<u>Visual / human disturbance</u> The interest features of the R Ehen SAC are aquatic hence this impact pathway is not relevant. Please see paragraphs 6.36 et seq in Chapter 6, which provides a detailed assessment. <u>Noise and Vibration</u> The nearest part of the River Ehen SAC is 3 km to the east of the site and the point at which it discharges to the sea is more than 11 km to the south of the site. The noise and vibration assessment has concluded that there are no predicted noise or vibration related impacts arising from the terrestrial elements of the proposed development that will impact on the Solway Firth pSPA (which is 1.16 km to the north west of the development site) (Chapter 14 Noise and Vibration, section 14.9.4 et seq,	Yes	Yes

River Ehen SAC – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>Environmental Statement, West Cumbria Mining, 2018). It therefore follows that disturbance impacts are not expected to extend as far as more distant European sites, including the River Ehen SAC. The noise assessment concludes that construction noise levels at the proposed SPA will be less than 20 dB(A) at the nearest point, which is low compared with prevailing background noise levels; for example, background noise levels in a rural area at night are typically of the order 30 Db(A) (Chapter 14 Noise and Vibration, Table A14.1.1, Environmental Statement, West Cumbria Mining, 2018). It is therefore reasonable to conclude that noise levels at the SAC will be even lower.</p> <p>The noise and vibration assessment has used ecological receptors, such as St Bees Head SSSI, that are closer to the land at the development site than the River Ehen SAC. Consequently it is reasonable to assume that the conclusions of the assessment for St Bees Head SSSI can be applied to the SAC and its supporting habitats and species. This conclusion is also reached within the marine assessment (Chapter 17 Marine Environment, Environmental Statement, section 17.32.9 et seq, West Cumbria Mining, 2018).</p> <p>No operational phase noise and vibration related impacts are expected on marine receptors as the mining will be undertaken 400m under the sea bed (Chapter 17 Marine Environment, Environmental Statement, section 17.32.9 et seq, West Cumbria Mining, 2018). The source sound and vibration will propagate away from source (the underground mining area) in all directions and begin to attenuate, i.e. it will reduce as it travels away from source. This will occur by two principle methods; geometric spreading and material damping. As sound energy travels away from source, attenuation will occur</p>		

River Ehen SAC – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>through reflection and refraction as the sound wave passes through layers of differing density. A significant amount of the source sound and vibration will therefore attenuate as it travels through the >400 m of rock above the mine. Attenuation will also occur between the various layers within the rock as well as between the rock/sediment and sediment/water boundaries.</p> <p>No disturbance of SAC qualifying species by noise and vibration is expected. The nearest part of the SAC is 3 km to the east, which is well beyond the limits of any predicted noise and vibration effects. Furthermore the qualifying features utilise freshwater and marine habitats, which further buffers them from the effects of noise and vibration. The separation distance between the land at the development site and the River Ehen estuary (11 km) is sufficiently large that disturbance related impacts are not expected, both for SAC qualifying features associated with inland (freshwater) habitats and those that use the marine environment (and the supporting habitats and species on which they depend) (Chapter 17 Marine Environment, Environmental Statement, section 17.32.9 et seq, West Cumbria Mining, 2018).</p> <p>As such, an in-combination effect with other plans or projects is considered very unlikely. However, to ensure a comprehensive assessment, the following potential sources of marine noise have been considered which could, in combination with WCM's project, have an in combination effect on the marine qualifying features of the River Ehen SAC via the noise / vibration impact pathway.</p> <p>A search has been carried out for Marine Management Organisation (MMO) active licences and current licence applications to identify any</p>		

River Ehen SAC – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>marine projects which could, in combination with WCM's project, have an in combination effect on any European site via the noise / vibration impact pathway. This has shown that there is no such project located within the MMO's northwest Marine Planning Area (inshore and offshore) that has the potential to have an in-combination effect with WCM's proposed development.</p> <p>The in-combination assessment has also considered the following existing potential sources of marine noise which may have the potential to interact with the noise / vibration impacts on marine species associated with the proposed development:</p> <p>Shipping: There are no major shipping lanes in the area around the proposed development and local vessel traffic densities are considered to be low. There is significant vessel traffic associated with the ports in the vicinity of Morecambe Bay (~50 km to the south), however this mostly consists of relatively small supply ships and the nearest major port is Liverpool, >100 km to the south of the proposed development.</p> <p>Windfarms: The closest operational windfarms located in the sea are Robin Rigg (~25 km to the north) and Walney (~38 km to the south).</p> <p>Military areas: There are multiple military practice areas in the north-eastern Irish Sea, the closest of which include a firing practice area to the northwest of the proposed offshore mining area (~9 km at closest point), and the Eskmeals Range, located near Ravenglass, which is charted as extending to 1 km south of South Head. No restrictions are placed on the right to transit these areas at any time, and the practice areas are operated using a clear range procedure, i.e.</p>		

River Ehen SAC – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>exercises and firing only take place when the areas are considered to be clear of all shipping. It can therefore be assumed that these areas are used only infrequently.</p> <p>All of these listed activities currently contribute to baseline noise conditions in the area of sea above the proposed offshore mining area; however, these are all intermittent sources of noise that are expected to have a temporary effect on the marine environment. Furthermore, WCM is not aware of any proposals to: increase shipping movements in the area; extend or increase activity associated with the nearest offshore windfarm sites or; increase use of nearby firing ranges and military practice areas.</p> <p>It is therefore concluded that sound and vibration arising from the proposed development will not have an effect on any European site in combination with other plans and projects.</p> <p>It is concluded that there will be no adverse effect on the integrity of the SAC (through impacts on the populations of the SAC qualifying species or through impacts on supporting habitats or species) through this pathway alone or in combination with other plans or projects.</p>		
3	Direct loss of or damage to marine habitat or disturbance to marine species from scouring and/or	Potential effect on migratory fish populations through: Deterioration of food resource;	<p>The proposed development will not impact directly on any part of the River Ehen SAC; however, impacts on marine habitat or disturbance to marine species from scouring and/or sedimentation are possible as a result of discharges of surface water made through the existing sea outfall pipe.</p> <p>Whilst the River Ehen is 3 km to the east of the site, the point at which it discharges to the sea is more than 11 km to the south of the</p>	Yes	Yes

River Ehen SAC – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
	sedimentation from surface water drainage via Saltom Bay.	Reduction in prey availability	<p>site. This is sufficiently distant that disturbance related impacts on fish migration linked to the SAC are not expected and in any event the surface water will be treated prior to discharge (Chapter 17 Marine Environment, Environmental Statement, paragraph 17.29.19, West Cumbria Mining, 2018).</p> <p>All surface water from areas of hard-standing and roofs will be captured during the operation phase and directed (via oil interceptors and silt traps) to the underground water storage tank for testing prior to discharge to sea using the existing outfall. In order to minimise potential scour, the maximum flow rate of the discharge will be limited to 25 l/s. In periods of heavy rainfall, flows will be attenuated on site through storage (Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, Flood Risk Assessment and Drainage Strategy, section 6.1.4.3 et seq, Environmental Statement, West Cumbria Mining, 2018; Chapter 17 Marine Environment, Environmental Statement, section 17.31, West Cumbria Mining, 2018).</p> <p>However, following heavy rainfall excess surface water runoff will need to be discharged to sea via the existing outfall in Saltom Bay. The discharge pipe runs down the foreshore and terminates in the intertidal zone (it is only fully exposed around low water springs tides). In order to minimise potential scour, the maximum flow rate of the discharge will be limited to 25 l/s, which will only be reached during and following heavy rainfall events.</p> <p>During the operational phase it is expected that there will be significant consumption of attenuated surface water for mining related activities, such as washing coal and preparation of the paste for backfill. It is therefore expected that the discharge of surface water</p>		

River Ehen SAC – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>will be significantly lower than the consented discharge rate (Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, Flood Risk Assessment and Drainage Strategy, section 6.1.4.3, Environmental Statement, West Cumbria Mining, 2018).</p> <p>The proposed development will minimise the potential for scour on the intertidal area around the outfall by limiting, wherever practicable, surface water discharge to when the outlet point is submerged. By only discharging surface water when the outlet point is submerged, the potential for scour at the proposed flow rates will be minimised (Chapter 17 Marine Environment, Environmental Statement, section 17.31.5, West Cumbria Mining, 2018).</p> <p>When the discharge point is exposed (i.e. not submerged), modelling results indicate that the proposed flow rate would be sufficient to mobilise fine sand material (i.e. no significant sediment re-suspension is likely (Chapter 17 Marine Environment, Environmental Statement, section 17.31.1, West Cumbria Mining, 2018). However, the sediments at the discharge point location consist of coarse sands (and cobbles and boulders), and so any re-suspended particles are likely to settle out very quickly. It is therefore concluded that any effect on water quality and biota will be localised and of minor significance (Chapter 17 Marine Environment, Environmental Statement, section 17.31.3, West Cumbria Mining, 2018).</p> <p>Modelling work has concluded that the Zone of Influence of the discharge into the sea, when combined with the existing leachate discharge, is 162m from the outfall, which means that the River Ehen SAC (which discharges to the sea at a point more than 11 km to the south of the site) and its qualifying features will not be directly</p>		

River Ehen SAC – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>impacted (Chapter 17 Marine Environment, Environmental Statement, section 17.34.7 et seq, West Cumbria Mining, 2018). Consequently, as the proposed discharge is not expected to have a significant effect on marine fauna, no significant effect is expected in respect of salmon (the only qualifying feature of the SAC that uses the marine environment) using the River Ehen estuary, which is 11 km to the south. Similarly, there will be no significant indirect impacts on SAC qualifying features as a result of impacts on prey species.</p> <p>As such, an in-combination effect with other plans or projects is considered very unlikely, however, to ensure a comprehensive assessment, other discharges from other plans and projects have also been considered (if they include a proposed discharge to sea which could combine with the 162m zone of influence from the Saltom Bay outfall) (Chapter 17 Marine Environment, Environmental Statement, sections 17.34.1 to 17.34.5, West Cumbria Mining, 2018).</p> <p>The zone of influence (ZOI) of the proposed surface water runoff discharge to Saltom Bay has been calculated as approximately 162 m and is over 8 km (by sea) from the mouth of Pow Beck. Hence no in-combination effect is predicted between the two sources of surface water runoff associated with the proposed development. The following licensable discharges to sea are within the vicinity of Saltom Bay and have the potential to interact with the surface water runoff discharges from the Saltom Bay outfall associated with the proposed development (Chapter 17 , paragraph 17.34, of the Environmental Statement):</p> <p>A private sewer discharge outfall is located approximately 350 m from the proposed WCM discharge point and it is permitted to discharge</p>		

River Ehen SAC – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>no more than 0.2 m³ per day. The permit associated with this discharge states that the discharge must have no adverse visible effect on the receiving environment. Modelling shows that the private sewer discharge from a pharmacy in Kells (to Saltom Bay) is outside the zone of influence for the WCM discharge (Chapter 17 Marine Environment, paragraph 17.34.7, Environmental Statement, 2018). This is the case even when the outfall is fully exposed at low tide. Due to the separation distance and the very small volume of this discharge, a significant in-combination effect is not predicted to occur (Chapter 17 Marine Environment, paragraph 17.34.8, Environmental Statement, 2018).</p> <p>A United Utilities pumping station discharge (to Saltom Bay) is also outside the zone of influence for the WCM discharge (Chapter 17 Marine Environment, paragraph 17.34.7, Environmental Statement, 2018). The pumping station may only discharge to sea in emergency circumstances when the pumping station is inoperative. No discharge occurs under normal circumstances. Due to the operational restrictions on this outfall, a significant in-combination effect is not predicted (Chapter 17 Marine Environment, paragraph 17.34.9, Environmental Statement, 2018).</p> <p>The Sellafield outfalls extend ~2.1 km from shore into the north-eastern Irish Sea and are located approximately 14.5 km directly south of the Saltom Bay discharge point (~17 km by sea). The Sellafield discharge outfall (at Seascale) is therefore also outside the zone of influence for the WCM discharge (Chapter 17 Marine Environment, paragraph 17.34.7, Environmental Statement, 2018). An in-combination effect is not predicted to occur due to the separation distance (Chapter 17 Marine Environment, paragraph</p>		

River Ehen SAC – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>17.34.11, Environmental Statement, 2018).</p> <p>The United Utilities wastewater treatment works discharge (at Parton, north of Whitehaven) is located approximately 5 km from the proposed discharge point in Saltom Bay. The discharge point of this outfall is therefore also outside the zone of influence for the WCM discharge (Chapter 17 Marine Environment, paragraph 17.34.7, Environmental Statement, 2018). Furthermore, the existing sewage discharge is discharged via diffuser(s) at a distance of ~1.9 km from shore, in the main current flows of the Solway Firth, and has an initial dilution factor of 50, which is generally considered appropriate for secondary treated sewage effluent. The United Utilities wastewater treatment works discharge is therefore considered to have sufficient initial and secondary mixing to ensure that it will not produce cumulative or in-combination impacts with the Saltom Bay discharge. (Chapter 17 Marine Environment, paragraph 17.34.10, Environmental Statement, 2018).</p> <p>There are no other projects which CCC is aware of in the marine environment in the proximity of the proposed mine that need to be included in an in-combination assessment. The NuGen Moorside development is currently on hold, and timescales, the nature and scope of the project, and its potential impacts are unknown. Therefore, no cumulative impact assessment is provided for this development.</p> <p>It is therefore concluded that the discharge will not have a significant effect on the marine environment, either alone or in combination with other discharges from other plans or projects (Chapter 17 Marine Environment, Environmental Statement, section 17.31.5, West</p>		

River Ehen SAC – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			Cumbria Mining, 2018). It is concluded that there will be no adverse effect on the integrity of the SAC (through impacts on the populations of the SAC qualifying species or through impacts on supporting habitats or species) through this pathway alone or in combination with other plans or projects.		
4	Direct loss of or damage to marine habitat or disturbance to marine species from scouring and/or sedimentation from any discharges via Pow Beck	Potential effect on migratory fish populations through: Deterioration of food resource; Reduction in prey availability	The proposed development will not impact directly on any part of the River Ehen SAC; however, impacts on marine habitat or disturbance to marine species from scouring and/or sedimentation are, however, possible at the point where Pow Beck discharges to the sea to the south of St Bees (approximately 2.8 km downstream of the development), as a result of the discharge of surface water made to connected watercourses from the conveyor and RLF. Whilst the River Ehen is 3 km to the east of the site, the point at which it discharges to the sea is more than 9 km to the south of the Pow Beck. This is sufficiently distant from the point where the Pow Beck discharges to sea that scour / sedimentation related impacts on fish migration linked to the SAC are not expected (Chapter 17 Marine Environment, Environmental Statement, paragraph 17.29.19, West Cumbria Mining, 2018). Surface water flows, if uncontrolled, have the potential to entrain sediments and contaminants generated by the operation of the proposed development, which may have negative impacts on marine water quality and marine biota. In addition, the flows themselves, if increased, will have the potential to cause scouring around the mouth of Pow Beck.	Yes	Yes

River Ehen SAC – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>In order to minimise potential scour, discharge and control measures will be adopted at the conveyor and rail loading facility sites (Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, sections 6.2 and 6.3, Flood Risk Assessment and Drainage Strategy, Environmental Statement, West Cumbria Mining, 2018; Sections 5.7 and 5.10 of the Draft Environmental Management Plan - Appendix E to Chapter 5 Project Description, Environmental Statement, West Cumbria Mining, 2018).</p> <p>Bellhouse Gill and an unnamed tributary of the Pow Beck (both ephemeral watercourses) are intersected by the conveyor route. The conveyor will be buried beneath these two ephemeral watercourses; during the construction phase, the watercourses will be diverted around the construction area. There will therefore be no increases in flow rates or discharge volumes to Pow Beck, and hence no impacts at St Bees beach due to scour are predicted (Chapter 17 Marine Environment, Environmental Statement, section 17.32.7, West Cumbria Mining, 2018).</p> <p>After construction the conveyor box will be backfilled with low permeability material in a way that will minimise ingress and tracking of surface water along the outside of the box structure. At this point the difference between the flow regimes pre and post construction is expected to be negligible (Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, Flood Risk Assessment and Drainage Strategy, section 6.2.1.2, Environmental Statement, West Cumbria Mining, 2018). This situation is expected to continue during the operational phase as the conveyor will be left in situ.</p>		

River Ehen SAC – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>During the operational phase, surface water runoff at the rail loading facility (RLF) site will be retained on-site in attenuation lagoons. Surface discharges to Pow Beck will be at a reduced rate compared to the current greenfield runoff rates. Whilst runoff volume will increase due to the increase in impermeable area, this excess volume will be discharged slowly after the peak flow has passed and will not increase flood flow rates in the Pow Beck.</p> <p>Consequently, impacts associated with scour at the mouth of the Pow Beck are therefore not predicted to occur (Chapter 17 Marine Environment, Environmental Statement, sections 17.32.7, West Cumbria Mining, 2018).</p> <p>It is concluded that there will be no adverse effect on the integrity of the sSAC (through impacts on the populations of the SAC qualifying species or through impacts on supporting habitats or species) through this pathway alone or in combination with other plans or projects.</p> <p>In relation to the risk of scouring there is predicted to be no impact at the point where the Pow Beck discharges to the sea from WCM's project and so no risk of any in combination impact.</p>		
5	Dust and other airborne contamination of marine and terrestrial habitats – MMS/RLF	<p>Potential effect on migratory fish populations through:</p> <p>Deterioration of food resource;</p>	<p>Please see paragraphs 6.144 et seq in Chapter 6, which provide a detailed assessment of the effects of dust.</p> <p>Please see paragraphs 6.148 et seq in Chapter 6, which provide a detailed assessment of the effects of NOx.</p>	Yes	Yes

River Ehen SAC – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
		Reduction in prey availability	<p>Please see paragraphs 6.152 et seq in Chapter 6, which provide a detailed assessment of the effects of N deposition.</p> <p>It is important to note that the analysis of air quality impacts presented in the above sections represents, as is legally required, a cumulative assessment of the proposed development (i.e. in combination with other plans and projects). This covers dust, traffic, and other operational controlled emissions and is explained in detail in the air quality assessment (Chapter 15 Air Quality, section 15.7, paragraph 15.7.1 - 15.7.4 [dust], paragraph 15.7.5 – 15.7.10 [traffic], paragraph 15.7.11 – 15.7.12 [controlled emissions], Environmental Statement, 2018).</p>		
6	Deterioration of marine water quality as a result of sediment-laden surface water run-off via Saltom Bay outfall	<p>Potential effect on SAC migratory fish populations including impacts on prey availability and deterioration of food resource through:</p> <p>Escape of sediment-entrained surface water</p>	<p>The proposed development will not impact directly on any part of the River Ehen SAC; however, impacts on marine water quality are possible as a result of discharges of surface water made through the existing sea outfall pipe.</p> <p>Whilst the River Ehen is 3 km to the east of the site, the point at which it discharges to the sea is more than 11 km to the south of the site. This is sufficiently distant that water quality related impacts on fish migration linked to the SAC are not expected (Chapter 17 Marine Environment, Environmental Statement, paragraph 17.29.19, West Cumbria Mining, 2018).</p> <p>In the absence of mitigation measures, the release of sediment-laden surface water into the marine environment could potentially impact on SAC qualifying features directly (if they are present in the vicinity of the discharge pipe), for example as a result of habitat deterioration</p>	Yes	Yes

River Ehen SAC – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>due to sediment laden water, or indirectly, by impacting on the prey species or habitats that SAC qualifying features depend upon.</p> <p>However, the effects of suspended solids on the marine environment will be fully mitigated during the operational phase.</p> <p>During the operation phase of the development surface water within the site will be collected and stored. The mining activities are water consumptive and so it is expected that most surface water will be utilised on site (Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, Flood Risk Assessment and Drainage Strategy, Section 6.1.4.3, Environmental Statement, West Cumbria Mining, 2018).</p> <p>All surface water arising from areas of hard-standing and roofs of buildings will be captured, attenuated on site and used in the coal processing plant and as a source of grey water (for example for toilet flushing etc) (Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, Flood Risk Assessment and Drainage Strategy, Section 6.1.4.3, Environmental Statement, West Cumbria Mining, 2018; Sections 5.7 and 5.10 of the Draft Environmental Management Plan - Appendix E to Chapter 5 Project Description, Environmental Statement, West Cumbria Mining, 2018).</p> <p>Storm water flows will be accommodated in the storm water attenuation tank on site (total capacity 6,500 m³) (Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, Flood Risk Assessment and Drainage Strategy, Section 6.1.4.3, Environmental Statement, West Cumbria Mining, 2018). Where possible, these flows will be used in the coal processing and associated plant, however in exceptional circumstances a storm water discharge may be required. Storm water flows will go to sea via the existing discharge point, and</p>		

River Ehen SAC – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>they will first be passed through silt traps and oil interceptors (although it should be noted that during the operational phase silt mobilisation will be limited once the bund vegetation is established, and no oils will be stored outside). All pollutants (including sediments) will be controlled through the adoption of best practice measures (Draft Environmental Management Plan - Appendix E to Chapter 5 Project Description, Sections 5.7 and 5.10, Environmental Statement, West Cumbria Mining, 2018).</p> <p>The discharge will be at a maximum flow rate of 25 l/s (Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, Flood Risk Assessment and Drainage Strategy, section 6.1.4.2 et seq, Environmental Statement, West Cumbria Mining, 2018). The attenuation measures described above will ensure that the maximum permitted flow rate of 25 l/s is not exceeded.</p> <p>Discharged surface water will necessarily have to achieve the environmental permit standard that will be set by the consenting authority (Chapter 5, Environmental Statement, Appendix E, Section 6, West Cumbria Mining, 2018; Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, Flood Risk Assessment and Drainage Strategy, section 6.1.4.3, Environmental Statement, West Cumbria Mining, 2018). A Marine Environmental Monitoring Plan will be implemented to assess the discharge and its environmental effects (Chapter 17 Marine Environment, Appendix C, paragraph 4.12, Environmental Statement, West Cumbria Mining, 2018).</p> <p>Modelling work has concluded that the Zone of Influence of the discharge into the sea, when combined with the existing leachate discharge, is 162m from the outfall, which means that the River Ehen SAC (which discharges to the sea at a point more than 11 km to the</p>		

River Ehen SAC – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>south of the site) and its qualifying features will not be directly impacted (Chapter 17 Marine Environment, Environmental Statement, section 17.34.7 et seq, West Cumbria Mining, 2018). As the proposed discharge is not expected to have a significant effect on marine fauna, no indirect impacts on SAC qualifying features are expected either, e.g. as a result of impacts on prey species.</p> <p>The proposed mitigation measures and the maximum discharge rate (together with rapid mixing and dispersal in the marine environment) will ensure that the effects of the discharge are limited in their extent. No significant effects are likely on the marine environment (Chapter 17 Marine Environment, paragraph 17.31.6, Environmental Statement, West Cumbria Mining, 2018), indeed any such impact is regarded as negligible. Consequently it is not expected that the discharge of sediment laden surface water will impact directly or indirectly on salmon (the only qualifying feature of the SAC that uses the marine environment) using the River Ehen estuary, which is 11 km to the south.</p> <p>The hydrological assessment has concluded that, with respect to groundwater and surface water, no pathway is considered to exist between the proposed development and any other proposed development (Chapter 12 Hydrology & Hydrogeology, Section 12.8, Environmental Statement, West Cumbria Mining, 2018).</p> <p>As such, an in-combination effect with other plans or projects is considered very unlikely, however, to ensure a comprehensive assessment, other discharges from other plans and projects have also been considered (if they include a proposed discharge to sea which could combine with the 162m zone of influence from the</p>		

River Ehen SAC – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>Saltom Bay outfall) (Chapter 17 Marine Environment, Environmental Statement, section 17.34.1 et seq, West Cumbria Mining, 2018).</p> <p>The zone of influence (ZOI) of the proposed surface water runoff discharge to Saltom Bay has been calculated as approximately 162 m and is over 8 km (by sea) from the mouth of Pow Beck. Hence no in-combination effect is predicted between the two sources of surface water runoff associated with the proposed development.</p> <p>The following licensable discharges to sea are within the vicinity of Saltom Bay and have the potential to interact with the surface water runoff discharges from the Saltom Bay outfall associated with the proposed development (Chapter 17 , paragraph 17.34, of the Environmental Statement):</p> <p>A private sewer discharge outfall is located approximately 350 m from the proposed WCM discharge point and it is permitted to discharge no more than 0.2 m³ per day. The permit associated with this discharge states that the discharge must have no adverse visible effect on the receiving environment. Modelling shows that the private sewer discharge from a pharmacy in Kells (to Saltom Bay) is outside the zone of influence for the WCM discharge (Chapter 17 Marine Environment, paragraph 17.34.7, Environmental Statement, 2018). This is the case even when the outfall is fully exposed at low tide. Due to the separation distance and the very small volume of this discharge, a significant in-combination effect is not predicted to occur (Chapter 17 Marine Environment, paragraph 17.34.8, Environmental Statement, 2018).</p> <p>A United Utilities pumping station discharge (to Saltom Bay) is also</p>		

River Ehen SAC – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>outside the zone of influence for the WCM discharge (Chapter 17 Marine Environment, paragraph 17.34.7, Environmental Statement, 2018). The pumping station may only discharge to sea in emergency circumstances when the pumping station is inoperative. No discharge occurs under normal circumstances. Due to the operational restrictions on this outfall, a significant in-combination effect is not predicted (Chapter 17 Marine Environment, paragraph 17.34.9, Environmental Statement, 2018).</p> <p>The Sellafield outfalls extend ~2.1 km from shore into the north-eastern Irish Sea and are located approximately 14.5 km directly south of the Saltom Bay discharge point (~17 km by sea). The Sellafield discharge outfall (at Seascale) is therefore also outside the zone of influence for the WCM discharge (Chapter 17 Marine Environment, paragraph 17.34.7, Environmental Statement, 2018). An in-combination effect is not predicted to occur due to the separation distance (Chapter 17 Marine Environment, paragraph 17.34.11, Environmental Statement, 2018).</p> <p>The United Utilities wastewater treatment works discharge (at Parton, north of Whitehaven) is located approximately 5 km from the proposed discharge point in Saltom Bay. The discharge point of this outfall is therefore also outside the zone of influence for the WCM discharge (Chapter 17 Marine Environment, paragraph 17.34.7, Environmental Statement, 2018). Furthermore, the existing sewage discharge is discharged via diffuser(s) at a distance of ~1.9 km from shore, in the main current flows of the Solway Firth, and has an initial dilution factor of 50, which is generally considered appropriate for secondary treated sewage effluent. The United Utilities wastewater treatment works discharge is therefore considered to have sufficient</p>		

River Ehen SAC – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>initial and secondary mixing to ensure that it will not produce cumulative or in-combination impacts with the Saltom Bay discharge. (Chapter 17 Marine Environment, paragraph 17.34.10, Environmental Statement, 2018).</p> <p>There are no other projects which CCC is aware of in the marine environment in the proximity of the proposed mine that need to be included in an in-combination assessment. The NuGen Moorside development is currently on hold, and timescales, the nature and scope of the project, and its potential impacts are unknown. Therefore, no cumulative impact assessment is provided for this development.</p> <p>It is concluded that there will be no adverse effect on the integrity of the SAC (through impacts on the populations of the SAC qualifying species or through impacts on supporting habitats or species) through this pathway alone or in combination with other plans or projects.</p>		
7	Deterioration of marine water quality as a result of disturbance of contaminated land and mobilisation of pollutants (including changes in pH, temperature,	<p>Potential effect on SAC migratory fish populations including impacts on prey availability and deterioration of food resource through:</p> <p>Mobilisation of underground contaminants disturbed</p>	<p>The proposed development will not impact directly on any part of the River Ehen SAC; however, impacts on marine water quality are possible as a result of discharges of surface water made through the existing sea outfall pipe.</p> <p>Whilst the River Ehen is 3 km to the east of the site, the point at which it discharges to the sea is more than 11 km to the south of the site. This is sufficiently distant that water quality related impacts on fish migration linked to the SAC (salmon is the only qualifying feature that uses the marine environment) are not expected and in any event the surface water will be treated prior to discharge.</p>	Yes	Yes

River Ehen SAC – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
	salinity, and dissolved oxygen) discharged via Saltom Bay outfall	Potential for pollution incidents from spillages, leakages etc from stored chemicals, fuel and oils on site.	<p>In the absence of mitigation measures, the release of pollutants into the marine environment could potentially impact on SAC qualifying features directly (if they are present in the vicinity of the discharge pipe), for example as a result of toxic effects, or indirectly, by impacting on the prey species that SAC qualifying features depend upon.</p> <p>There are also potential impacts associated with the discharge and these are related to non-toxic inputs. These include the effects of pH, temperature, salinity and dissolved oxygen.</p> <p>However, the effects of pollutants on the marine environment will be fully mitigated during the operational phase. During the operation phase of the development surface water within the site will be collected and stored. The mining activities are water consumptive and so it is expected that most surface water will be utilised on site (Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, Flood Risk Assessment and Drainage Strategy, Section 6.1.4.3, Environmental Statement, West Cumbria Mining, 2018).</p> <p>All surface water arising from areas of hard-standing and roofs of buildings will be captured, attenuated on site and used in the coal processing plant and as a source of grey water (for example for toilet flushing etc) (Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, Flood Risk Assessment and Drainage Strategy, Section 6.1.4.3, Environmental Statement, West Cumbria Mining, 2018; Sections 5.7 and 5.10 of the Draft Environmental Management Plan - Appendix E to Chapter 5 Project Description, Environmental Statement, West Cumbria Mining, 2018).</p>		

River Ehen SAC – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>Storm water flows will be accommodated in the storm water attenuation tank on site (total capacity 6,500m³) (Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, Flood Risk Assessment and Drainage Strategy, Section 6.1.4.3, Environmental Statement, West Cumbria Mining, 2018). Where possible, these flows will be used in the coal processing and associated plant, however in exceptional circumstances a storm water discharge may be required. Storm water flows will go to sea via the existing discharge point, and they will first be passed through silt traps and oil interceptors (although it should be noted that during the operational phase silt mobilisation will be limited once the bund vegetation is established, and no oils will be stored outside).</p> <p>The discharge will be at a maximum flow rate of 25 l/s (Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, Flood Risk Assessment and Drainage Strategy, section 6.1.4.2 et seq, Environmental Statement, West Cumbria Mining, 2018). The attenuation measures described above will ensure that the maximum permitted flow rate of 25 l/s is not exceeded.</p> <p>Discharged surface water will necessarily have to achieve the environmental permit standard that will be set by the consenting authority (Chapter 5, Environmental Statement, Appendix E, Section 6, West Cumbria Mining, 2018; Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, Flood Risk Assessment and Drainage Strategy, section 6.1.4.3, Environmental Statement, West Cumbria Mining, 2018). All other pollutants will be controlled through the adoption of best practice measures (Draft Environmental Management Plan - Appendix E to Chapter 5 Project Description,</p>		

River Ehen SAC – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>Sections 5.7 and 5.10, Environmental Statement, West Cumbria Mining, 2018). A Marine Environmental Monitoring Plan will be implemented to assess the potential impacts of the discharge (Chapter 17 Marine Environment, Appendix C, paragraph 4.12, Environmental Statement, West Cumbria Mining, 2018).</p> <p>The marine assessment has concluded that the proposed discharge of surface water into the marine environment is not expected to have an effect on pH, salinity, water temperature of dissolved oxygen (Chapter 17 Marine Environment, Environmental Statement, West Cumbria Mining, 2018, paragraphs 17.31.7 [pH], 17.31.9-.12 [salinity], 17.31.8 [water temperature], 17.31.13-.14 [dissolved oxygen]).</p> <p>Modelling work has concluded that the Zone of Influence of the discharge into the sea, when combined with the existing leachate discharge, is 162m from the outfall, which means that the River Ehen SAC (which discharges to the sea at a point more than 11 km to the south of the site) and its qualifying features will not be directly impacted (Chapter 17 Marine Environment, Environmental Statement, section 17.34.7 et seq, West Cumbria Mining, 2018). As the proposed discharge is not expected to have a significant effect on marine fauna, no indirect impacts on SAC qualifying features are expected either, e.g. as a result of impacts on prey species.</p> <p>The proposed mitigation measures and the maximum discharge rate (together with rapid mixing and dispersal in the marine environment) will ensure that the effects of the discharge are limited in their extent. No significant effects are likely on the marine environment (Chapter 17 Marine Environment, paragraph 17.31.6, Environmental Statement, West Cumbria Mining, 2018), indeed any such impact is</p>		

River Ehen SAC – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>regarded as negligible</p> <p>Consequently it is not expected that the discharge of pollutants (including changes in pH, temperature, salinity, and dissolved oxygen) will impact directly or indirectly on salmon (the only qualifying feature of the SAC that uses the marine environment) using the River Ehen estuary, which is 11 km to the south. The hydrological assessment has concluded that, with respect to groundwater and surface water, no pathway is considered to exist between the proposed development and any other proposed development (Chapter 12 Hydrology & Hydrogeology, Section 12.8, Environmental Statement, West Cumbria Mining, 2018).</p> <p>As such, an in-combination effect with other plans or projects is considered very unlikely, however, to ensure a comprehensive assessment, other discharges from other plans and projects have also been considered (if they include a proposed discharge to sea which could combine with the 162m zone of influence from the Saltom Bay outfall) (Chapter 17 Marine Environment, Environmental Statement, section 17.34.1 et seq, West Cumbria Mining, 2018).</p> <p>The zone of influence (ZOI) of the proposed surface water runoff discharge to Saltom Bay has been calculated as approximately 162 m and is over 8 km (by sea) from the mouth of Pow Beck. Hence no in-combination effect is predicted between the two sources of surface water runoff associated with the proposed development.</p> <p>The following licensable discharges to sea are within the vicinity of Saltom Bay and have the potential to interact with the surface water runoff discharges from the Saltom Bay outfall associated with the</p>		

River Ehen SAC – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>proposed development (Chapter 17 , paragraph 17.34, of the Environmental Statement):</p> <p>A private sewer discharge outfall is located approximately 350 m from the proposed WCM discharge point and it is permitted to discharge no more than 0.2 m³ per day. The permit associated with this discharge states that the discharge must have no adverse visible effect on the receiving environment. Modelling shows that the private sewer discharge from a pharmacy in Kells (to Saltom Bay) is outside the zone of influence for the WCM discharge (Chapter 17 Marine Environment, paragraph 17.34.7, Environmental Statement, 2018). This is the case even when the outfall is fully exposed at low tide. Due to the separation distance and the very small volume of this discharge, a significant in-combination effect is not predicted to occur (Chapter 17 Marine Environment, paragraph 17.34.8, Environmental Statement, 2018).</p> <p>A United Utilities pumping station discharge (to Saltom Bay) is also outside the zone of influence for the WCM discharge (Chapter 17 Marine Environment, paragraph 17.34.7, Environmental Statement, 2018). The pumping station may only discharge to sea in emergency circumstances when the pumping station is inoperative. No discharge occurs under normal circumstances. Due to the operational restrictions on this outfall, a significant in-combination effect is not predicted (Chapter 17 Marine Environment, paragraph 17.34.9, Environmental Statement, 2018).</p> <p>The Sellafeld outfalls extend ~2.1 km from shore into the north-eastern Irish Sea and are located approximately 14.5 km directly south of the Saltom Bay discharge point (~17 km by sea). The</p>		

River Ehen SAC – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>Sellafield discharge outfall (at Seascale) is therefore also outside the zone of influence for the WCM discharge (Chapter 17 Marine Environment, paragraph 17.34.7, Environmental Statement, 2018). An in-combination effect is not predicted to occur due to the separation distance (Chapter 17 Marine Environment, paragraph 17.34.11, Environmental Statement, 2018).</p> <p>The United Utilities wastewater treatment works discharge (at Parton, north of Whitehaven) is located approximately 5 km from the proposed discharge point in Saltom Bay. The discharge point of this outfall is therefore also outside the zone of influence for the WCM discharge (Chapter 17 Marine Environment, paragraph 17.34.7, Environmental Statement, 2018). Furthermore, the existing sewage discharge is discharged via diffuser(s) at a distance of ~1.9 km from shore, in the main current flows of the Solway Firth, and has an initial dilution factor of 50, which is generally considered appropriate for secondary treated sewage effluent. The United Utilities wastewater treatment works discharge is therefore considered to have sufficient initial and secondary mixing to ensure that it will not produce cumulative or in-combination impacts with the Saltom Bay discharge. (Chapter 17 Marine Environment, paragraph 17.34.10, Environmental Statement, 2018).</p> <p>There are no other projects which CCC is aware of in the marine environment in the proximity of the proposed mine that need to be included in an in-combination assessment. The NuGen Moorside development is currently on hold, and timescales, the nature and scope of the project, and its potential impacts are unknown. Therefore, no cumulative impact assessment is provided for this development.</p>		

River Ehen SAC – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			It is concluded that there will be no adverse effect on the integrity of the SAC (through impacts on the populations of the SAC qualifying species or through impacts on supporting habitats or species) through this pathway alone or in combination with other plans or projects.		
8	Deterioration of marine water quality as a result of sediment-laden surface water run-off via Pow Beck catchment	Potential effect on SAC migratory fish populations including impacts on prey availability and deterioration of food resource through surface water discharge and run-off	<p>The proposed development will not impact directly on any part of the River Ehen SAC; however, impacts on marine water quality are possible as a result of discharges of surface water made from the RLF and Conveyor to the Bellhouse Gill and Pow Beck, which eventually discharges to the sea to the south of St Bees approximately 2.8 km downstream of the development.</p> <p>Whilst the River Ehen is 3 km to the east of the site, the point at which it discharges to the sea via Pow Beck is more than 9 km to the south of the site. This is sufficiently distant that water quality related impacts on fish migration linked to the SAC (salmon is the only qualifying feature that uses the marine environment) are not expected and in any event the surface water will be treated prior to discharge.</p> <p>In the absence of mitigation the release of sediment-laden surface water via the Pow Beck into the marine environment could potentially impact on SAC qualifying features directly (if they are present in the vicinity of the Pow Beck where it discharges to sea at St Bees Beach), for example as a result of habitat deterioration due to sediment-laden water, or indirectly, by impacting on the prey species that SAC qualifying features depend upon.</p> <p>The effects of suspended solids (transported via the Pow Beck) on the marine environment will be fully mitigated through measures that</p>	Yes	Yes

River Ehen SAC – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>will be adopted during the operational phase of the development.</p> <p>Surface discharges to Pow Beck will be at a reduced rate compared to the current greenfield runoff rates. Whilst runoff volume will increase due to the increase in impermeable area, this excess volume will be discharged slowly after the peak flow has passed and will not increase flood flow rates in the Pow Beck.</p> <p>During the operation phase of the development surface water within the site will be collected and stored. The mining activities are water consumptive and so it is expected that most surface water will be utilised on site (Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, Flood Risk Assessment and Drainage Strategy, Section 6.1.4.3, Environmental Statement, West Cumbria Mining, 2018). All other pollution effects will be fully mitigated through the adoption of best practice pollution prevention measures at the conveyor site and RLF. (Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, Flood Risk Assessment and Drainage Strategy, Sections 6.2 and 6.3, Environmental Statement, West Cumbria Mining, 2018 and Draft Environmental Management Plan - Appendix E to Chapter 5 Project Description, Sections 5.7 and 5.10, Environmental Statement, West Cumbria Mining, 2018).</p> <p>Dilution effects within Bellhouse Gill and Pow Beck will also reduce the environmental concentrations of any contaminants present (though this is considered unlikely once good practice measures are in place) to the point where they are not predicted to have any significant impact on the marine environment (Chapter 17 Marine Environment, paragraph 17.29.21 – 17.29.23, Environmental Statement, West Cumbria Mining, 2018).</p>		

River Ehen SAC – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>These good practice measures, in conjunction with mixing and dilution effects of the freshwater watercourses, mean that no significant pollution impact on the marine environment is predicted via the Pow Beck pathway (see Chapter 17, Marine Environment, paragraph 17.29.22, Environmental Statement 2018), indeed any such impact is regarded as negligible. Consequently it is not expected that the discharge to Pow Beck will impact directly or indirectly on SAC populations of qualifying features or their supporting habitats or species.</p> <p>The hydrological assessment has concluded that, with respect to groundwater and surface water, no pathway is considered to exist between the proposed development and any other proposed development (Chapter 12 Hydrology & Hydrogeology, Section 12.8, Environmental Statement, West Cumbria Mining, 2018).</p> <p>As such an in-combination effect with other plans or projects is considered very unlikely, however, to ensure a comprehensive assessment, nearby licensable discharges to sea in the vicinity of the mouth of Pow Beck have nevertheless been investigated.</p> <p>The zone of influence (ZOI) of the proposed surface water runoff discharge to Saltom Bay has been calculated as approximately 162 m and is over 8 km (by sea) from the mouth of Pow Beck. Hence no in-combination effect is predicted between the two sources of surface water runoff associated with the proposed development.</p> <p>The closest licensed discharge to the mouth of Pow Beck is a United Utilities pumping station located at Nethertown, which has a permit to</p>		

River Ehen SAC – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>discharge to sea (permit no. 017470153) approximately 4 km south of the mouth of Pow Beck. However, under the conditions of the permit, the pumping station may only discharge to sea in emergency circumstances when the pumping station is inoperative as a result of e.g. electrical failure or rising main failure. No discharge occurs under normal circumstances. For this reason this discharge has been scoped out of the in-combination impact assessment.</p> <p>The United Utilities WwTW located at Braystones, south of Nethertown, discharges to sea via a long sea outfall (permit no. 017470152). The discharge point of this outfall is located approximately 7 km south from the mouth of Pow Beck and hence any combined effect between it and any discharges made via Pow Beck is very unlikely. Furthermore, the existing sewage discharge is discharged via diffuser(s) at a distance of ~2 km from shore and has an initial dilution factor generally considered appropriate for secondary treated sewage effluent. The existing discharge is therefore considered to have sufficient initial and secondary mixing to ensure that it will not produce cumulative or in-combination impacts with other discharges.</p> <p>The Sellafield outfalls extend ~2.1 km from shore into the north-eastern Irish Sea and are located approximately 8.8 km from the mouth of Pow Beck and hence, again, it is considered highly unlikely that the two plumes will interact. Furthermore, the two discharges are not similar; the proposed discharges to Pow Beck are ambient temperature freshwater which, with good practice guidelines in place, will not be contaminated, while the Sellafield discharge is a cooling water discharge, i.e. warm seawater. There is therefore no realistic likelihood of in-combination effects between the two discharges.</p>		

River Ehen SAC – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this combination with other plans or projects (see also Chapter 8)?
			<p>There are no other projects which CCC is aware of in the marine environment in the proximity of the proposed mine that need to be included in an in-combination assessment. The NuGen Moorside development is currently on hold, and timescales, the nature and scope of the project, and its potential impacts are unknown. Therefore, no cumulative impact assessment is provided for this development.</p> <p>It is concluded that there will be no adverse effect on the integrity of the SAC (through impacts on the populations of the SAC qualifying species or through impacts on supporting habitats or species) through this pathway alone or in combination with other plans or projects.</p>		
9	Deterioration of marine water quality as a result of disturbance of contaminated land and mobilisation of pollutants (including changes in pH, temperature, salinity, and dissolved oxygen) discharged via	<p>Potential effect on SAC migratory fish populations including impacts on prey availability and deterioration of food resource through:</p> <p>Mobilisation of underground contaminants disturbed</p> <p>Potential for pollution incidents from spillages, leakages</p>	<p>The proposed development will not impact directly on any part of the River Ehen SAC; however, impacts on marine water quality are possible as a result of discharges of surface water made from the RLF and Conveyor to the Bellhouse Gill and Pow Beck, which eventually discharges to the sea to the south of St Bees approximately 2.8 km downstream of the development.</p> <p>Whilst the River Ehen is 3 km to the east of the site, the point at which it discharges to the sea via Pow Beck is more than 9 km to the south of the site. This is sufficiently distant that water quality related impacts on fish migration linked to the SAC (salmon is the only qualifying feature that uses the marine environment) are not expected and in any event the surface water will be treated prior to discharge.</p> <p>In the absence of mitigation the release of pollutants into the marine environment could potentially impact on SAC qualifying features</p>	Yes	Yes

River Ehen SAC – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
	Pow Beck catchment	etc from stored chemicals, fuel and oils on site.	<p>directly (if they are present in the vicinity of the Pow Beck where it discharges to sea), for example as a result of toxic effects, or indirectly, by impacting on the prey species that SAC qualifying features depend upon. There are also potential impacts associated with the discharge related to non-toxic inputs. These include the effects of pH, temperature, salinity and dissolved oxygen.</p> <p>Prior to the main construction period it is planned that a 6 month remediation phase will be required to treat pockets of contamination which may remain in areas of the site. Consequently no contamination will remain in areas that could be impacted during the operational phase of the development, and so no pathway exists for the mobilisation of contaminants (Chapter 17 Marine Environment, Environmental Statement, West Cumbria Mining, 2018, paragraph 19.29.7).</p> <p>Bellhouse Gill and an unnamed tributary of the Pow Beck (both ephemeral watercourses) are intersected by the conveyor route. The conveyor will be buried beneath these ephemeral watercourses; following construction, the flow regime at these locations will return to pre-development conditions. There will therefore be no increases in flow rates or discharge volumes to Pow Beck (Chapter 17 Marine Environment, Environmental Statement, section 17.32.7, West Cumbria Mining, 2018). The conveyor route is enclosed, which will minimise the chance of contamination of local watercourses.</p> <p>Details of the discharge and control measures at the conveyor and rail loading facility sites are described in Chapter 12 Hydrology &</p>		

River Ehen SAC – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>Hydrogeology, Appendix 12.7, Flood Risk Assessment and Drainage Strategy, Sections 6.2 and 6.3, Environmental Statement, West Cumbria Mining, 2018. Pollutants will be controlled through the adoption of best practice measures (Draft Environmental Management Plan - Appendix E to Chapter 5 Project Description, Sections 5.7 and 5.10, Environmental Statement, West Cumbria Mining, 2018).</p> <p>During the operational phase, surface water runoff at the rail loading facility (RLF) site will be retained on-site in attenuation lagoons. Surface discharges to Pow Beck will be at a reduced rate compared to the current greenfield runoff rates. Whilst runoff volume will increase due to the increase in impermeable area, this excess volume will be discharged slowly after the peak flow has passed and will not increase flood flow rates in the Pow Beck. As with both the Marchon and the conveyor construction sites, water pollution controls, including the use of attenuation lagoons, will be implemented to minimise sediment and pollutant release to freshwater watercourses and hence the marine environment.</p> <p>Dilution effects within Bellhouse Gill and Pow Beck will also reduce the environmental concentrations of any contaminants present (though this is considered unlikely once good practice measures are in place) to the point where they are not predicted to have any significant impact on the marine environment (Chapter 17 Marine Environment, paragraph 17.29.21 – 17.29.23, Environmental Statement, West Cumbria Mining, 2018).</p>		

River Ehen SAC – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>The adoption of good practice measures, in conjunction with mixing and dilution effects of the freshwater watercourses (the Pow Beck discharges to sea 2.8 km downstream of the development site), mean that no significant pollution impact on the marine environment is predicted via the Pow Beck pathway (see Chapter 17, Marine Environment, paragraph 17.29.22, Environmental Statement, 2018), indeed any such impact is regarded as negligible.</p> <p>Consequently it is not expected that there will be discharge of pollutants to Pow Beck (including changes in pH, temperature, salinity, and dissolved oxygen) will impact directly or indirectly on any qualifying feature of the SAC that uses the marine environment.</p> <p>The hydrological assessment has concluded that, with respect to groundwater and surface water, no pathway is considered to exist between the proposed development and any other proposed development (Chapter 12 Hydrology & Hydrogeology, Section 12.8, Environmental Statement, West Cumbria Mining, 2018).</p> <p>As such an in-combination effect with other plans or projects is considered very unlikely, however, to ensure a comprehensive assessment, nearby licensable discharges to sea in the vicinity of the mouth of Pow Beck have nevertheless been investigated.</p> <p>The zone of influence (ZOI) of the proposed surface water runoff discharge to Saltom Bay has been calculated as approximately 162 m</p>		

River Ehen SAC – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>and is over 8 km (by sea) from the mouth of Pow Beck. Hence no in-combination effect is predicted between the two sources of surface water runoff associated with the proposed development.</p> <p>The closest licensed discharge to the mouth of Pow Beck is a United Utilities pumping station located at Nethertown, which has a permit to discharge to sea (permit no. 017470153) approximately 4 km south of the mouth of Pow Beck. However, under the conditions of the permit, the pumping station may only discharge to sea in emergency circumstances when the pumping station is inoperative as a result of e.g. electrical failure or rising main failure. No discharge occurs under normal circumstances. For this reason this discharge has been scoped out of the in-combination impact assessment.</p> <p>The United Utilities WwTW located at Braystones, south of Nethertown, discharges to sea via a long sea outfall (permit no. 017470152). The discharge point of this outfall is located approximately 7 km south from the mouth of Pow Beck and hence any combined effect between it and any discharges made via Pow Beck is very unlikely. Furthermore, the existing sewage discharge is discharged via diffuser(s) at a distance of ~2 km from shore and has an initial dilution factor generally considered appropriate for secondary treated sewage effluent. The existing discharge is therefore considered to have sufficient initial and secondary mixing to ensure that it will not produce cumulative or in-combination impacts with other discharges.</p> <p>The Sellafield outfalls extend ~2.1 km from shore into the north-eastern Irish Sea and are located approximately 8.8 km from the mouth of Pow Beck and hence, again, it is considered highly unlikely</p>		

River Ehen SAC – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>that the two plumes will interact. Furthermore, the two discharges are not similar; the proposed discharges to Pow Beck are ambient temperature freshwater which, with good practice guidelines in place, will not be contaminated, while the Sellafield discharge is a cooling water discharge, i.e. warm seawater. There is therefore no realistic likelihood of in-combination effects between the two discharges.</p> <p>There are no other projects which CCC is aware of in the marine environment in the proximity of the proposed mine that need to be included in an in-combination assessment. The NuGen Moorside development is currently on hold, and timescales, the nature and scope of the project, and its potential impacts are unknown. Therefore, no cumulative impact assessment is provided for this development.</p> <p>It is concluded that there will be no adverse effect on the integrity of the SAC (through impacts on the populations of the SAC qualifying species or through impacts on supporting habitats or species) through this pathway alone or in combination with other plans or projects.</p>		
10	Subsidence effects under terrestrial environment	Subsidence under the terrestrial environment as a result of sub-surface mining activities	<p>Any subsidence arising from onshore mining will not have an effect the River Ehen SAC, which is 3 km to the east of the site at its closest point. Subsidence effects will be highly localised, i.e. above the panels.</p> <p>In the absence of mitigation, it is possible that subsidence (and any associated seismic events induced by subsidence) arising from mining related activities may impact on the SAC qualifying species and the supporting habitats and species on which they depend, as a result of changes in sediment deposition.</p>	Yes	Yes

River Ehen SAC – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>For the areas of onshore mining, the proposed partial extraction mining technique in combination with the use of paste backfill in mined areas may result in, as a worst case scenario, very low levels of subsidence under the terrestrial habitats (65% void back-filling is proposed). If subsidence does occur it will happen gradually. The proposed mining method under the terrestrial environment (note that there is no coal extraction under St Bees Head SSSI and the MCZ) involves the backfilling of voids with waste material.</p> <p>The paste backfill involves waste rock being converted into a paste type material, which will consist of ground up rock, a cementitious additive and water. This will be pumped into the underground areas that have been mined. The deposited material, once hardened, provides additional stability underground (Briefing Note, Paste Plant Process, Appendix D to Chapter 5 Project Description, Environmental Statement, West Cumbria Mining, 2018).</p> <p>It is expected that the paste would fill 65% of the void space created by mining in the panels where paste backfill is employed (Appendix B to Chapter 5 Project Description, Environmental Statement, West Cumbria Mining, 2018). It is therefore planned, in the event that the amount of waste is limited, to prioritise the paste backfill to areas that will be most sensitive to subsidence, such as the terrestrial areas (Appendix D to Chapter 5 Project Description, Environmental Statement, West Cumbria Mining, 2018).</p> <p>The maximum predicted subsidence arising from areas of multiple panel mining is 30 cm in the absence of paste backfill, which reduces to less than 15 cm when the same excavation is backfilled by 65%</p>		

River Ehen SAC – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>with paste. The maximum rate at which the subsidence will take place over the centre of a panel is 0.6 cm per day (without paste backfill) and less than 0.3 cm per day (with paste backfill) over a two-week period when the face of the panel is directly underneath (Appendix D to Chapter 5 Project Description, Environmental Statement, West Cumbria Mining, 2018). Subsidence, if it happens, will only occur during the operation phase of the development (if a drift collapses this is not predicted to result in subsidence at the surface): Appendix B, Section 3.3, Subsidence Briefing Note, Chapter 5 Project Description, Environmental Statement, West Cumbria Mining, 2018).</p> <p>Overall it is concluded that, whilst subsidence (and therefore associated seismic events induced by subsidence) may occur below onshore terrestrial habitat, such subsidence will be of limited magnitude and will be slow to develop. Consequently it is not expected that subsidence will impact directly or indirectly on the SAC's population of qualifying species or the supporting species or habitats on which they depend. As no impact through subsidence is predicted onshore it follows that no significant impact through induced seismicity (i.e. seismicity associated with and induced by subsidence) is expected.</p> <p>As no impact is predicted on the SAC's qualifying features via this pathway, there is no effect with which the effect of any other plan or project can combine. In any event, there are no other plans or projects known with subsidence impacts which could act in combination with the predicted subsidence from the WCM project and as such no scope of any in-combination impact via this pathway.</p> <p>It is concluded that there will be no adverse effect on the integrity of</p>		

River Ehen SAC – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			the SAC (through impacts on the populations of the SAC qualifying species or through impacts on supporting habitats or species) through this pathway alone or in combination with other plans or projects.		
11	Subsidence effects under the marine environment	Subsidence under the marine environment as a result of sub-surface mining activities	<p>Any subsidence arising from offshore mining will not have an effect the River Ehen SAC, which is 3 km to the east of the site at its closest point. Subsidence effects will be highly localised, i.e. above the panels.</p> <p>In the absence of mitigation, it is possible that subsidence (and any associated seismic events induced by subsidence) arising from mining related activities may impact on the SAC qualifying species and the supporting habitats and species on which they depend, as a result of changes in sediment deposition.</p> <p>For the areas of offshore mining, the proposed partial extraction mining technique in combination with the use of paste backfill in mined areas may result in, as a worst case scenario, very low levels of subsidence under the marine habitats. If subsidence does occur it will happen gradually. The proposed mining method under the marine environment (note that there is no coal extraction under St Bees Head SSSI and the MCZ) involves the backfilling of voids with waste material. The paste backfill involves waste rock being converted into a paste type material, which will consist of ground up rock, a cementitious additive and water. This will be pumped into the underground areas that have been mined. The deposited material, once hardened, provides additional stability underground (Briefing Note, Paste Plant Process, Appendix D to Chapter 5 Project Description, Environmental Statement, West Cumbria Mining, 2018).</p>	Yes	Yes

River Ehen SAC – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>It is expected that the paste would fill 65% of the void space created by mining in the panels where paste backfill is employed (Appendix B to Chapter 5 Project Description, Environmental Statement, West Cumbria Mining, 2018). It is therefore planned, in the event that the amount of waste is limited, to prioritise the paste backfill to areas that will be most sensitive to subsidence, such as the terrestrial areas (Appendix D to Chapter 5 Project Description, Environmental Statement, West Cumbria Mining, 2018). Only a proportion of the panels beneath offshore areas will be paste backfilled.</p> <p>The maximum predicted subsidence arising from areas of multiple panel mining is 30 cm in the absence of paste backfill, which reduces to less than 15 cm when the same excavation is backfilled by 65% with paste. The maximum rate at which the subsidence will take place over the centre of a panel is 0.6 cm per day (without paste backfill) and less than 0.3 cm per day (with paste backfill) over a two-week period when the face of the panel is directly underneath (Appendix D to Chapter 5 Project Description, Environmental Statement, West Cumbria Mining, 2018). Subsidence, if it happens, will only occur during the operation phase of the development (if a drift collapses this is not predicted to result in subsidence at the surface): Appendix B, Section 3.3, Subsidence Briefing Note, Chapter 5 Project Description, Environmental Statement, West Cumbria Mining, 2018).</p> <p>For the areas of offshore mining, as a result of the proposed partial extraction method and the use of paste backfill (as detailed above), approximately 10% of the offshore mining area may experience subsidence up to 15 cm, and approximately 50% may experience subsidence of up to 7.5 cm (Appendix B, Subsidence Briefing Note,</p>		

River Ehen SAC – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>Chapter 5 Project Description, Environmental Statement, West Cumbria Mining, 2018). As noted above, subsidence, if it occurs, will be slow to develop.</p> <p>Whilst subsidence (and associated seismic events induced by subsidence) has the potential to impact on marine biota, potentially resulting in an indirect effect on anadromous fish species (which are qualifying features of the R. Ehen SAC), no significant effects are likely due to the small magnitude and slow rate of the predicted change (Chapter 17 Marine Environment, Section 17.30.13, Environmental Statement, West Cumbria Mining 2018).</p> <p>The marine assessment concludes that no significant impact is expected on the shore as a result of subsidence or associated seismic events under the marine environment (Chapter 17 Marine Environment, Section 17.30.11, Environmental Statement, West Cumbria Mining 2018). It also concludes that there no significant effect from the project through subsidence or associated seismic events on the Solway Firth pSPA, which is the nearest European site (Chapter 17 Marine Environment, Section 17.30.12 et seq, Environmental Statement, West Cumbria Mining 2018). It can therefore be concluded that, whilst subsidence may occur above some of the mined areas offshore (i.e. beyond the MCZ), due to the slow nature of its development and the overlying 15-20m thick marine sediments, no significant impact is expected on the marine environment and therefore the River Ehen SAC and its qualifying features.</p> <p>As no significant impact through subsidence is predicted either onshore or offshore, it follows that no significant impact through</p>		

River Ehen SAC – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>induced seismicity (i.e. seismicity associated with and induced by subsidence) is expected.</p> <p>There are no other plans or projects known with subsidence impacts which could act in combination with the predicted subsidence from the WCM project and as such no scope of any in-combination impact via this pathway.</p> <p>It is concluded that there will be no adverse effect on the integrity of the SAC (through impacts on the populations of the SAC qualifying species or through impacts on supporting habitats or species) through this pathway alone or in combination with other plans or projects.</p>		

Decommissioning Phase

Table 7: Impact mechanisms and pathways during the decommissioning phase of the development – River Ehen SAC

River Ehen SAC – decommissioning phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
1	Direct loss of or damage to terrestrial habitat – MMS, RLF/UC	Potential loss of terrestrial supporting habitat for SAC qualifying features through land-take	The interest features of the R Ehen SAC are aquatic hence there is no impact pathway from loss of or damage to terrestrial habitat. Please see paragraphs 6.23 et seq in Chapter 6, which provide a detailed assessment.	Yes	Yes
2	Disturbance of marine or terrestrial qualifying species (visual/noise/vibration) – MMS/RLF/UC/UM)	Potential for disruption and/or injury to migratory fish through noise/vibration as a result of construction processes e.g. piling/drilling	<u>Visual / human disturbance</u> The interest features of the R Ehen SAC are aquatic hence this impact pathway has no relevance. Please see paragraphs 6.46 et seq in Chapter 6, which provides a detailed assessment. <u>Noise and vibration</u> There is no mechanism by which construction related noise and vibration can impact on the River Ehen SAC. The nearest part of the River Ehen SAC is 3 km to the east of the site and the point at which it discharges to the sea is more than 11 km to the south of the site. This is well beyond the limits of any noise and vibration effects. There will be no decommissioning related noise and vibration related impacts on marine receptors as no offshore works or mining activities will take place in this phase.	Yes	Yes

River Ehen SAC – decommissioning phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			Please see paragraphs 6.51 et seq in Chapter 6, which provides a detailed assessment.		
3	Direct loss of or damage to marine habitat or disturbance to marine species from scouring and/or sedimentation from any discharges via the Saltom Bay outfall	Potential effect on migratory fish populations through: Deterioration of food resource; Reduction in prey availability	<p>The proposed development will not impact directly on any part of the River Ehen SAC; however, impacts on marine habitat or disturbance to marine species from scouring and/or sedimentation are possible as a result of discharges of surface water made through the existing sea outfall pipe.</p> <p>Whilst the River Ehen is 3 km to the east of the site, the point at which it discharges to the sea is more than 11 km to the south of the site. This is sufficiently distant that scour / sedimentation related impacts on fish migration linked to the SAC are not expected as previously predicted for the construction phase of the development (Chapter 17 Marine Environment, Environmental Statement, paragraph 17.29.19, West Cumbria Mining, 2018) and in any event the surface water will be treated prior to discharge. The same conclusion is reached for the decommissioning phase.</p> <p>Once the mine is closed the above ground structures on the site will be removed and the land reinstated and planted for ecology and recreation. The underground surface water attenuation tank is likely to be disconnected and decommissioned rather than removed to minimise environmental disturbance. Disconnection of the attenuation tank will be the final phase of decommissioning so that it remains in use until the final restoration scheme is in place. It is proposed to replace the storage provided by the attenuation tank with a pond and wetland feature, with an overflow to the pipeline that discharges into the sea (Chapter 12 Hydrology & Hydrogeology,</p>	Yes	Yes

River Ehen SAC – decommissioning phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>Appendix 12.7, Flood Risk Assessment and Drainage Strategy, section 6.1.4.4, Environmental Statement, West Cumbria Mining, 2018)..</p> <p>Discharge rates from the restored site will be reduced compared to the operational phase, as the impermeable surfaces will be removed and replaced by a more retentive naturalised catchment. The proposed pond and wetland feature will also provide attenuation during high rainfall events (Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, Flood Risk Assessment and Drainage Strategy, section 6.1.4.4, Environmental Statement, West Cumbria Mining, 2018).</p> <p>During the decommissioning process the proposed development will continue to minimise the potential for scour on the intertidal area around the outfall by limiting, wherever practicable, surface water discharge to when the outlet point is submerged. The discharge pipe runs down the foreshore and terminates in the intertidal zone (it is only fully exposed around low water springs tides). By only discharging surface water when the outlet point is submerged, the potential for scour at the proposed flow rates will be minimised as previously noted for the operational phase (Chapter 17 Marine Environment, Environmental Statement, section 17.31.3, West Cumbria Mining, 2018). In order to minimise potential scour, the maximum flow rate of the discharge will be limited to 25 l/s, which will only be reached during and following heavy rainfall events.</p> <p>All surface water from areas of hard-standing and roofs will be captured during the decommissioning phase and directed via silt traps and oil interceptors to the underground water storage tank for</p>		

River Ehen SAC – decommissioning phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>testing prior to discharge to sea using the existing outfall. This will ensure that the maximum permitted flow rate of 25 l/s is not exceeded. However, the interception of surface water will change during the decommissioning phase as building and other infrastructure are removed. When the discharge point is exposed (i.e. not submerged), modelling results indicate that the proposed flow rate would be sufficient to mobilise fine sand material (i.e. no significant sediment re-suspension is likely). However, the sediments at the discharge point location consist of coarse sands (and cobbles and boulders), and so any re-suspended particles are likely to settle out very quickly. It is therefore concluded that any effect on water quality and biota will be localised and of minor significance (Chapter 17 Marine Environment, Environmental Statement, section 17.33.8, West Cumbria Mining, 2018).</p> <p>Modelling work has concluded that the Zone of Influence of the discharge into the sea, when combined with the existing leachate discharge, is 162m from the outfall, which means that the River Ehen SAC and its qualifying features will not be directly impacted (Chapter 17 Marine Environment, Environmental Statement, section 17.34.7 et seq, West Cumbria Mining, 2018). Furthermore, as the proposed discharge is not expected to have a significant effect on marine fauna, no indirect impacts on SAC qualifying features are expected either, e.g. as a result of impacts on prey species.</p> <p>Runoff volumes and flow rates are likely to be lower than during the operational phase, and so the impacts of the discharge are likely to be the same as or less than those predicted for the operational phase.</p> <p>The proposed mitigation measures and the maximum discharge rate</p>		

River Ehen SAC – decommissioning phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>(together with rapid mixing and dispersal in the marine environment) will ensure that the effects of the discharge are limited in their extent. No significant effects are likely on the qualifying features of the River Ehen SAC as any residual impacts arising from the discharge of surface water to sea are assessed as being minor (Chapter 17 Marine Environment, paragraph 17.33.8, Environmental Statement, West Cumbria Mining, 2018). Furthermore the River Ehen discharges to the sea is more than 11 km to the south of the site and so it is not expected that scour or sedimentation associated with the discharge of surface water will impact directly or indirectly on the SAC's population of qualifying features or their supporting habitats or species.</p> <p>As such, an in-combination effect with other plans or projects is considered very unlikely, however, to ensure a comprehensive assessment, other discharges from other plans and projects have also been considered (if they include a proposed discharge to sea which could combine with the 162m zone of influence from the Saltom Bay outfall) (Chapter 17 Marine Environment, Environmental Statement, sections 17.34.1 to 17.34.5, West Cumbria Mining, 2018).</p> <p>The zone of influence (ZOI) of the proposed surface water runoff discharge to Saltom Bay has been calculated as approximately 162 m and is over 8 km (by sea) from the mouth of Pow Beck. Hence no in-combination effect is predicted between the two sources of surface water runoff associated with the proposed development.</p> <p>The following licensable discharges to sea are within the vicinity of Saltom Bay and have the potential to interact with the surface water runoff discharges from the Saltom Bay outfall associated with the</p>		

River Ehen SAC – decommissioning phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>proposed development (Chapter 17 , paragraph 17.34, of the Environmental Statement):</p> <p>A private sewer discharge outfall is located approximately 350 m from the proposed WCM discharge point and it is permitted to discharge no more than 0.2 m³ per day. The permit associated with this discharge states that the discharge must have no adverse visible effect on the receiving environment. Modelling shows that the private sewer discharge from a pharmacy in Kells (to Saltom Bay) is outside the zone of influence for the WCM discharge (Chapter 17 Marine Environment, paragraph 17.34.7, Environmental Statement, 2018). This is the case even when the outfall is fully exposed at low tide. Due to the separation distance and the very small volume of this discharge, a significant in-combination effect is not predicted to occur (Chapter 17 Marine Environment, paragraph 17.34.8, Environmental Statement, 2018).</p> <p>A United Utilities pumping station discharge (to Saltom Bay) is also outside the zone of influence for the WCM discharge (Chapter 17 Marine Environment, paragraph 17.34.7, Environmental Statement, 2018). The pumping station may only discharge to sea in emergency circumstances when the pumping station is inoperative. No discharge occurs under normal circumstances. Due to the operational restrictions on this outfall, a significant in-combination effect is not predicted (Chapter 17 Marine Environment, paragraph 17.34.9, Environmental Statement, 2018).</p> <p>The Sellafield outfalls extend ~2.1 km from shore into the north-eastern Irish Sea and are located approximately 14.5 km directly south of the Saltom Bay discharge point (~17 km by sea). The</p>		

River Ehen SAC – decommissioning phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>Sellafield discharge outfall (at Seascale) is therefore also outside the zone of influence for the WCM discharge (Chapter 17 Marine Environment, paragraph 17.34.7, Environmental Statement, 2018). An in-combination effect is not predicted to occur due to the separation distance (Chapter 17 Marine Environment, paragraph 17.34.11, Environmental Statement, 2018).</p> <p>The United Utilities wastewater treatment works discharge (at Parton, north of Whitehaven) is located approximately 5 km from the proposed discharge point in Saltom Bay. The discharge point of this outfall is therefore also outside the zone of influence for the WCM discharge (Chapter 17 Marine Environment, paragraph 17.34.7, Environmental Statement, 2018). Furthermore, the existing sewage discharge is discharged via diffuser(s) at a distance of ~1.9 km from shore, in the main current flows of the Solway Firth, and has an initial dilution factor of 50, which is generally considered appropriate for secondary treated sewage effluent. The United Utilities wastewater treatment works discharge is therefore considered to have sufficient initial and secondary mixing to ensure that it will not produce cumulative or in-combination impacts with the Saltom Bay discharge. (Chapter 17 Marine Environment, paragraph 17.34.10, Environmental Statement, 2018).</p> <p>There are no other projects which CCC is aware of in the marine environment in the proximity of the proposed mine that need to be included in an in-combination assessment. The NuGen Moorside development is currently on hold, and timescales, the nature and scope of the project, and its potential impacts are unknown. Therefore, no cumulative impact assessment is provided for this development.</p>		

River Ehen SAC – decommissioning phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>It is therefore concluded that the discharge will not have a significant effect on the marine environment, either alone or in combination with other discharges from other plans or projects; predicted effects during the decommissioning phase will be the same as or less than the predicted effects during the construction phase (Chapter 17 Marine Environment, Environmental Statement, sections 17.29.8 to 17.29.11 and 17.34.7, West Cumbria Mining, 2018).</p> <p>It is concluded that there will be no adverse effect on the integrity of the SAC (through impacts on the populations of the SAC qualifying species or through impacts on supporting habitats or species) through this pathway alone or in combination with other plans or projects.</p>		
4	Direct loss of or damage to marine habitat or disturbance to marine species from scouring and/or sedimentation from any discharges via Pow Beck	<p>Potential effect on migratory fish populations through:</p> <p>Deterioration of food resource;</p> <p>Reduction in prey availability</p>	<p>The proposed development will not impact directly on any part of the River Ehen SAC; however, impacts on marine habitat or disturbance to marine species from scouring and/or sedimentation are, however, possible at the point where Pow Beck discharges to the sea to the south of St Bees (approximately 2.8 km downstream of the development), as a result of the discharge of surface water made to connected watercourses from the conveyor and RLF.</p> <p>Whilst the River Ehen is 3 km to the east of the site, the point at which it discharges to the sea via Pow Beck is more than 9 km to the south of the site. This is sufficiently distant that water quality related impacts on fish migration linked to the SAC (salmon is the only qualifying feature that uses the marine environment) are not expected and in any event the surface water will be treated prior to discharge.</p>	Yes	Yes

River Ehen SAC – decommissioning phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>Surface water flows, if uncontrolled, have the potential to entrain sediments and contaminants generated by the decommissioning of the proposed development, which may have negative impacts on marine water quality and marine biota. In addition, the flows themselves, if increased, will have the potential to cause scouring around the mouth of Pow Beck.</p> <p>In order to minimise potential scour, discharge and control measures will be adopted at the conveyor and rail loading facility sites during the decommissioning phase (Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, sections 6.2 and 6.3, Flood Risk Assessment and Drainage Strategy, Environmental Statement, West Cumbria Mining, 2018; Sections 5.7 and 5.10 of the Draft Environmental Management Plan - Appendix E to Chapter 5 Project Description, Environmental Statement, West Cumbria Mining, 2018).</p> <p>Bellhouse Gill and an unnamed tributary of the Pow Beck (both ephemeral watercourses) are intersected by the conveyor route. The conveyor will be buried beneath these ephemeral watercourses and during the operation (and subsequently decommissioning) phase the flow regime at these locations will return to pre-development conditions and this is expected to remain the case during the decommissioning phase. There will therefore be no increases in flow rates or discharge volumes to Pow Beck during the operation phase and this is expected to continue during the decommissioning phase as well. Consequently no impacts at St Bees beach due to scour are predicted.</p> <p>Once the mine is closed the above ground structures on the site will be removed and the land reinstated and planted for ecology and recreation. It is expected that the drainage infrastructure would</p>		

River Ehen SAC – decommissioning phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>remain in place and continue to function, although removing the buildings and ceasing operation would reduce the runoff and sediment generation from the site. If all the infrastructure is removed, including the drainage system, then the site would revert to its pre-development state.</p> <p>After construction the conveyor box will be backfilled with low permeability material in a way that will minimise ingress and tracking of surface water along the outside of the box structure. At this point the difference between the flow regimes pre and post construction is expected to be negligible (Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, Flood Risk Assessment and Drainage Strategy, section 6.2.1.2, Environmental Statement, West Cumbria Mining, 2018). This situation is expected to continue during the decommissioning phase as the conveyor will be left in situ.</p> <p>During the decommissioning phase the storage lagoons, wetland, drainage pipes and outfalls to receiving watercourses that serve the RLF will remain.</p> <p>Discharge rates from the restored site will be reduced compared to the operational phase, as the impermeable surfaces will be removed and replaced by more retentive naturalised catchment.</p> <p>Consequently, impacts associated with scour at the mouth of the Pow Beck at St Bees Beach are not predicted to occur (Chapter 17 Marine Environment, Environmental Statement, sections 17.29.20 to 17.29.23, West Cumbria Mining, 2018).</p> <p>It is concluded that there will be no adverse effect on the integrity of</p>		

River Ehen SAC – decommissioning phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>the SAC (through impacts on the populations of the SAC qualifying species or through impacts on supporting habitats or species) through this pathway alone or in combination with other plans or projects.</p> <p>In relation to the risk of scouring there is predicted to be no impact at the point where the Pow Beck discharges to the sea from WCM's project and so no risk of any in combination impact.</p>		
5	Dust and other airborne contamination of marine and terrestrial habitats – MMS/RLF/UC	<p>Potential effect on migratory fish populations through:</p> <p>Deterioration of food resource;</p> <p>Reduction in prey availability</p>	<p>Please see paragraphs 6.157 et seq in Chapter 6, which provide a detailed assessment of the effects of dust.</p> <p>Please see paragraphs 6.161 et seq in Chapter 6, which provide a detailed assessment of the effects of NOx.</p> <p>Please see paragraphs 6.163 et seq in Chapter 6, which provide a detailed assessment of the effects of N deposition.</p> <p>It is important to note that the analysis of air quality impacts presented in the above sections represents, as is legally required, a cumulative assessment of the proposed development (i.e. in combination with other plans and projects). This covers dust, traffic, and other operational controlled emissions and is explained in detail in the air quality assessment (Chapter 15 Air Quality, section 15.7, paragraph 15.7.1 - 15.7.4 [dust], paragraph 15.7.5 – 15.7.10 [traffic], paragraph 15.7.11 – 15.7.12 [controlled emissions], Environmental Statement, 2018)).</p>	Yes	Yes
6	Deterioration of marine	Potential effect on SAC migratory fish	The proposed development will not impact directly on any part of the River Ehen SAC; however, impacts on marine water quality are	Yes	Yes

River Ehen SAC – decommissioning phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
	water quality as a result of sediment-laden surface water run-off during decommissioning via the Saltom Bay outfall	populations including impacts on prey availability and deterioration of food resource through: Escape of sediment-entrained surface water	<p>possible as a result of discharges of surface water made through the existing sea outfall pipe.</p> <p>Whilst the River Ehen is 3 km to the east of the site, the point at which it discharges to the sea is more than 11 km to the south of the site. This is sufficiently distant that water quality related impacts on fish migration linked to the SAC are not expected and in any event the surface water will be treated prior to discharge (Chapter 17 Marine Environment, Environmental Statement, paragraph 17.29.19, West Cumbria Mining, 2018).</p> <p>The discharge of water to sea during the decommissioning phase could have similar impacts as those predicted during the operational phase. In the absence of mitigation measures, the release of sediment-laden surface water into the marine environment could potentially impact on SAC qualifying features directly (if they are present in the vicinity of the discharge pipe), for example as a result of habitat deterioration due to sediment laden water, or indirectly, by impacting on the prey species or habitats that SAC qualifying features depend upon.</p> <p>However, the effects of suspended solids on the marine environment will be fully mitigated during the decommissioning phase. The planned decommissioning phase is over 50 years away, and WCM expect that in the final few years leading up to decommissioning, close liaison will be required with the environmental regulatory body(ies) in force at the time to develop a detailed decommissioning plan which takes full account of the requirement to minimise environmental impacts.</p>		

River Ehen SAC – decommissioning phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>All surface water from areas of hard-standing and roofs will be captured during the decommissioning phase and directed via silt traps and oil interceptors to the underground water storage tank for testing prior to discharge to sea using the existing outfall. However, the interception of surface water will change during the decommissioning phase as buildings and other infrastructure are removed.</p> <p>Storm water flows will be accommodated in the storm water attenuation tank on site (total capacity 6,500m³) (Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, Flood Risk Assessment and Drainage Strategy, Section 6.1.4.3, Environmental Statement, West Cumbria Mining, 2018). In exceptional circumstances, a storm water discharge may be required. Storm water flows will go to sea via the existing discharge point, and they will first be passed through silt traps and oil interceptors (although it should be noted that during the decommissioning phase silt mobilisation will be limited once the bund vegetation is established, and no oils will be stored outside). All pollutants will be controlled through the adoption of best practice measures (Draft Environmental Management Plan - Appendix E to Chapter 5 Project Description, Sections 5.7 and 5.10, Environmental Statement, West Cumbria Mining, 2018).</p> <p>The discharge will be at a maximum flow rate of 25 l/s (Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, Flood Risk Assessment and Drainage Strategy, section 6.1.4.2 et seq, Environmental Statement, West Cumbria Mining, 2018). The attenuation measures described above will ensure that the maximum permitted flow rate of 25 l/s is not exceeded.</p>		

River Ehen SAC – decommissioning phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>Discharged surface water will necessarily have to achieve the environmental permit standard that will be set by the consenting authority (Chapter 5, Environmental Statement, Appendix E, Section 6, West Cumbria Mining, 2018; Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, Flood Risk Assessment and Drainage Strategy, section 6.1.3.3, Environmental Statement, West Cumbria Mining, 2018). A Marine Environmental Monitoring Plan will be implemented to assess the potential impacts of the discharge (Chapter 17 Marine Environment, Appendix C, paragraph 4.12, Environmental Statement, West Cumbria Mining, 2018). Once the mine is closed the above ground structures on the site will be removed and the land reinstated and planted for ecology and recreation. The underground surface water attenuation tank is likely to be disconnected and decommissioned rather than removed to minimise environmental disturbance. Disconnection of the attenuation tank will be the final phase of decommissioning so that it remains in use until the final restoration scheme is in place. It is proposed to replace the storage provided by the attenuation tank with a pond and wetland feature, with an overflow to the pipeline that discharges into the sea (Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, Flood Risk Assessment and Drainage Strategy, section 6.1.4.4, Environmental Statement, West Cumbria Mining, 2018).</p> <p>Discharge rates from the restored site will be reduced compared to the operational phase, as the impermeable surfaces will be removed and replaced by more retentive naturalised catchment. The proposed pond and wetland feature will also provide attenuation during high rainfall events.</p>		

River Ehen SAC – decommissioning phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>The ongoing discharge of surface water to sea could have impacts on marine water quality and local marine biota. While contaminants in the restored site are not predicted to be significant, entrainment of sediments could lead to increases in turbidity and smothering effects on biota. Deterioration of marine water quality is not likely due to the provision of appropriate water treatment, which will necessarily have to achieve the environmental permit standard that will be set by the consenting authority (Chapter 5, Environmental Statement, Appendix E, Section 6, West Cumbria Mining, 2018; Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, Flood Risk Assessment and Drainage Strategy, Environmental Statement, West Cumbria Mining, 2018 sets out details of the water treatment facilities during operation [section 6.1.4.4]).</p> <p>The input of freshwater into the marine environment could also impact marine biota via salinity stress. The discharge would need to be subject to a discharge permit, and any and all conditions of the discharge permit will have to be adhered to. Although runoff volumes and flow rates are likely to be lower than during the operational phase, given the permanent nature of the discharge, it is likely that the impacts of the discharge post decommissioning would continue to be minor.</p> <p>Modelling work has concluded that the Zone of Influence of the discharge into the sea, when combined with the existing leachate discharge, is 162m from the outfall, which means that the River Ehen SAC (which discharges to the sea at a point more than 11 km to the</p>		

River Ehen SAC – decommissioning phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>south of the site) and its qualifying features will not be directly impacted (Chapter 17 Marine Environment, Environmental Statement, section 17.34.7 et seq, West Cumbria Mining, 2018). As the proposed discharge is not expected to have a significant effect on marine fauna, no indirect impacts on SAC qualifying features are expected either, e.g. as a result of impacts on prey species.</p> <p>The proposed mitigation measures and the maximum discharge rate (together with rapid mixing and dispersal in the marine environment) will ensure that the effects of the discharge are limited in their extent. No significant effects are likely on the marine environment (Chapter 17 Marine Environment, paragraph 17.33.8, Environmental Statement, West Cumbria Mining, 2018), indeed any such impact is regarded as negligible. Consequently it is not expected that the discharge of sediment laden surface water will impact directly or indirectly on the SAC's population of qualifying features or their supporting habitats or species.</p> <p>The hydrological assessment has concluded that, with respect to groundwater and surface water, no pathway is considered to exist between the proposed development and any other proposed development (Chapter 12 Hydrology & Hydrogeology, Section 12.8, Environmental Statement, West Cumbria Mining, 2018).</p> <p>As such, an in-combination effect with other plans or projects is considered very unlikely, however, to ensure a comprehensive assessment, other discharges from other plans and projects have also been considered (if they include a proposed discharge to sea which could combine with the 162m zone of influence from the Saltom Bay outfall) (Chapter 17 Marine Environment, Environmental</p>		

River Ehen SAC – decommissioning phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>Statement, section 17.34.1 et seq, West Cumbria Mining, 2018) and.</p> <p>The zone of influence (ZOI) of the proposed surface water runoff discharge to Saltom Bay has been calculated as approximately 162 m and is over 8 km (by sea) from the mouth of Pow Beck. Hence no in-combination effect is predicted between the two sources of surface water runoff associated with the proposed development.</p> <p>The following licensable discharges to sea are within the vicinity of Saltom Bay and have the potential to interact with the surface water runoff discharges from the Saltom Bay outfall associated with the proposed development (Chapter 17 , paragraph 17.34, of the Environmental Statement):</p> <p>A private sewer discharge outfall is located approximately 350 m from the proposed WCM discharge point and it is permitted to discharge no more than 0.2 m³ per day. The permit associated with this discharge states that the discharge must have no adverse visible effect on the receiving environment. Modelling shows that the private sewer discharge from a pharmacy in Kells (to Saltom Bay) is outside the zone of influence for the WCM discharge (Chapter 17 Marine Environment, paragraph 17.34.7, Environmental Statement, 2018). This is the case even when the outfall is fully exposed at low tide. Due to the separation distance and the very small volume of this discharge, a significant in-combination effect is not predicted to occur (Chapter 17 Marine Environment, paragraph 17.34.8, Environmental Statement, 2018).</p> <p>A United Utilities pumping station discharge (to Saltom Bay) is also outside the zone of influence for the WCM discharge (Chapter 17</p>		

River Ehen SAC – decommissioning phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>Marine Environment, paragraph 17.34.7, Environmental Statement, 2018). The pumping station may only discharge to sea in emergency circumstances when the pumping station is inoperative. No discharge occurs under normal circumstances. Due to the operational restrictions on this outfall, a significant in-combination effect is not predicted (Chapter 17 Marine Environment, paragraph 17.34.9, Environmental Statement, 2018).</p> <p>The Sellafield outfalls extend ~2.1 km from shore into the north-eastern Irish Sea and are located approximately 14.5 km directly south of the Saltom Bay discharge point (~17 km by sea). The Sellafield discharge outfall (at Seascale) is therefore also outside the zone of influence for the WCM discharge (Chapter 17 Marine Environment, paragraph 17.34.7, Environmental Statement, 2018). An in-combination effect is not predicted to occur due to the separation distance (Chapter 17 Marine Environment, paragraph 17.34.11, Environmental Statement, 2018).</p> <p>The United Utilities wastewater treatment works discharge (at Parton, north of Whitehaven) is located approximately 5 km from the proposed discharge point in Saltom Bay. The discharge point of this outfall is therefore also outside the zone of influence for the WCM discharge (Chapter 17 Marine Environment, paragraph 17.34.7, Environmental Statement, 2018). Furthermore, the existing sewage discharge is discharged via diffuser(s) at a distance of ~1.9 km from shore, in the main current flows of the Solway Firth, and has an initial dilution factor of 50, which is generally considered appropriate for secondary treated sewage effluent. The United Utilities wastewater treatment works discharge is therefore considered to have sufficient initial and secondary mixing to ensure that it will not produce</p>		

River Ehen SAC – decommissioning phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>cumulative or in-combination impacts with the Saltom Bay discharge. (Chapter 17 Marine Environment, paragraph 17.34.10, Environmental Statement, 2018).</p> <p>There are no other projects which CCC is aware of in the marine environment in the proximity of the proposed mine that need to be included in an in-combination assessment. The NuGen Moorside development is currently on hold, and timescales, the nature and scope of the project, and its potential impacts are unknown. Therefore, no cumulative impact assessment is provided for this development.</p> <p>It is therefore concluded that the discharge will not have a significant effect on the marine environment, either alone or in combination with other discharges from other plans or projects; predicted effects during the decommissioning phase will be the same as or less than the predicted effects during the construction phase (Chapter 17 Marine Environment, Environmental Statement, sections 17.29.8 – 17.29.11 and 17.34.7, West Cumbria Mining, 2018).</p> <p>It is concluded that there will be no adverse effect on the integrity of the SAC (through impacts on the populations of the SAC qualifying species or through impacts on supporting habitats or species) through this pathway alone or in combination with other plans or projects.</p>		
7	Deterioration of marine water quality as a result of disturbance of	Potential effect on SAC migratory fish populations including impacts on prey availability and	The proposed development will not impact directly on any part of the River Ehen SAC; however, impacts on marine water quality are possible as a result of discharges of surface water made through the existing sea outfall pipe.	Yes	Yes

River Ehen SAC – decommissioning phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
	contaminated land and mobilisation of pollutants (including changes in pH, temperature, salinity, and dissolved oxygen) discharged via Saltom Bay outfall	<p>deterioration of food resource through:</p> <p>Mobilisation of underground contaminants disturbed</p> <p>Pollution incidents from spillages, leakages etc from stored chemicals, fuel and oils on site.</p>	<p>Whilst the River Ehen is 3 km to the east of the site, the point at which it discharges to the sea is more than 11 km to the south of the site. This is sufficiently distant that water quality related impacts on fish migration linked to the SAC are not expected and in any event the surface water will be treated prior to discharge (Chapter 17 Marine Environment, Environmental Statement, paragraph 17.29.19, West Cumbria Mining, 2018).</p> <p>In the absence of mitigation measures, the release of pollutants into the marine environment could potentially impact on SAC qualifying features directly (if they are present in the vicinity of the discharge pipe), for example as a result of toxic effects, or indirectly, by impacting on the prey species that SAC qualifying features depend upon.</p> <p>There are potential impacts associated with the discharge and these are related to non-toxic inputs. These include the effects of pH, temperature, salinity and dissolved oxygen. The marine assessment has concluded that, during the construction phase, the proposed discharge of surface water into the marine environment is not likely to have a significant effect on pH, salinity, water temperature of dissolved oxygen (Chapter 17 Marine Environment, Environmental Statement, West Cumbria Mining, 2018, paragraphs 17.29.12 [pH], 17.29.14-17 [salinity], 17.29.13 [water temperature], 17.29.18 [dissolved oxygen]). Conditions during the decommissioning phase are expected to be the same or better than those predicted for the construction phase.</p> <p>The effects of pollutants on the marine environment will be fully</p>		

River Ehen SAC – decommissioning phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>mitigated during the decommissioning phase. The planned decommissioning phase is over 50 years away, and WCM expect that in the final few years leading up to decommissioning, close liaison will be required with the environmental regulatory body(ies) in force at the time to develop a detailed decommissioning plan which takes full account of the requirement to minimise environmental impacts.</p> <p>All surface water from areas of hard-standing and roofs will be captured during the decommissioning phase and directed via silt traps and oil interceptors to the underground water storage tank for testing prior to discharge to sea using the existing outfall. However, the interception of surface water will change during the decommissioning phase as buildings and other infrastructure are removed. The discharge will be at a maximum flow rate of 25 l/s (Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, Flood Risk Assessment and Drainage Strategy, section 6.1.4.2 et seq, Environmental Statement, West Cumbria Mining, 2018). The attenuation measures described above will ensure that the maximum permitted flow rate of 25 l/s is not exceeded.</p> <p>Discharged surface water will necessarily have to achieve the environmental permit standard that will be set by the consenting authority (Chapter 5, Environmental Statement, Appendix E, Section 6, West Cumbria Mining, 2018; Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, Flood Risk Assessment and Drainage Strategy, section 6.1.3.3, Environmental Statement, West Cumbria Mining, 2018). All other pollutants will be controlled through the adoption of best practice measures (Draft Environmental Management Plan - Appendix E to Chapter 5 Project Description, Sections 5.7 and 5.10, Environmental Statement, West Cumbria Mining, 2018). A Marine Environmental Monitoring Plan will be</p>		

River Ehen SAC – decommissioning phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>implemented to assess the potential impacts of the discharge (Chapter 17 Marine Environment, Appendix C, paragraph 4.12, Environmental Statement, West Cumbria Mining, 2018).</p> <p>Once the mine is closed the above ground structures on the site will be removed and the land reinstated and planted for ecology and recreation. The underground surface water attenuation tank is likely to be disconnected and decommissioned rather than removed to minimise environmental disturbance. Disconnection of the attenuation tank will be the final phase of decommissioning so that it remains in use until the final restoration scheme is in place. It is proposed to replace the storage provided by the attenuation tank with a pond and wetland feature, with an overflow to the pipeline that discharges into the sea.</p> <p>Discharge rates from the restored site will be reduced compared to the operational phase, as the impermeable surfaces will be removed and replaced by a more retentive naturalised catchment. The proposed pond and wetland feature will also provide attenuation during high rainfall events (Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, Flood Risk Assessment and Drainage Strategy, section 6.1.4.4, Environmental Statement, West Cumbria Mining, 2018). Modelling work has concluded that the Zone of Influence of the discharge into the sea, when combined with the existing leachate discharge, is 162m from the outfall, which means that the River Ehen SAC (which discharges to the sea at a point more than 11 km to the south of the site) and its qualifying features will not be directly impacted (Chapter 17 Marine Environment, Environmental Statement, section 17.34.7 et seq, West Cumbria Mining, 2018). As the proposed discharge is not expected to have a significant effect on</p>		

River Ehen SAC – decommissioning phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>marine fauna, no indirect impacts on SAC qualifying features are expected either, e.g. as a result of impacts on prey species.</p> <p>The proposed mitigation measures and the maximum discharge rate (together with rapid mixing and dispersal in the marine environment) will ensure that the effects of the discharge are limited in their extent. During the decommissioning phase runoff volumes and flow rates are likely to be lower than during the operational phase: given the permanent nature of the discharge, it is likely that the impacts of the discharge post decommissioning would continue to be minor. Taking this into account It is therefore concluded that any effect on water quality and biota will be localised and of minor significance (Chapter 17 Marine Environment, paragraph 17.33.8, Environmental Statement, West Cumbria Mining, 2018).</p> <p>Consequently it is not expected that the discharge of pollutants (including changes in pH, temperature, salinity, and dissolved oxygen) will impact directly or indirectly on SAC populations of qualifying features or their supporting habitats or species.</p> <p>The hydrological assessment has concluded that, with respect to groundwater and surface water, no pathway is considered to exist between the proposed development and any other proposed development (Chapter 12 Hydrology & Hydrogeology, Section 12.8, Environmental Statement, West Cumbria Mining, 2018).</p> <p>As such, an in-combination effect with other plans or projects is considered very unlikely, however, to ensure a comprehensive assessment, other discharges from other plans and projects have also been considered (if they include a proposed discharge to sea</p>		

River Ehen SAC – decommissioning phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>which could combine with the 162m zone of influence from the Saltom Bay outfall) (Chapter 17 Marine Environment, Environmental Statement, section 17.34.1 et seq, West Cumbria Mining, 2018).</p> <p>The zone of influence (ZOI) of the proposed surface water runoff discharge to Saltom Bay has been calculated as approximately 162 m and is over 8 km (by sea) from the mouth of Pow Beck. Hence no in-combination effect is predicted between the two sources of surface water runoff associated with the proposed development.</p> <p>The following licensable discharges to sea are within the vicinity of Saltom Bay and have the potential to interact with the surface water runoff discharges from the Saltom Bay outfall associated with the proposed development (Chapter 17 , paragraph 17.34, of the Environmental Statement):</p> <p>A private sewer discharge outfall is located approximately 350 m from the proposed WCM discharge point and it is permitted to discharge no more than 0.2 m³ per day. The permit associated with this discharge states that the discharge must have no adverse visible effect on the receiving environment. Modelling shows that the private sewer discharge from a pharmacy in Kells (to Saltom Bay) is outside the zone of influence for the WCM discharge (Chapter 17 Marine Environment, paragraph 17.34.7, Environmental Statement, 2018). This is the case even when the outfall is fully exposed at low tide. Due to the separation distance and the very small volume of this discharge, a significant in-combination effect is not predicted to occur (Chapter 17 Marine Environment, paragraph 17.34.8, Environmental Statement, 2018).</p>		

River Ehen SAC – decommissioning phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>A United Utilities pumping station discharge (to Saltom Bay) is also outside the zone of influence for the WCM discharge (Chapter 17 Marine Environment, paragraph 17.34.7, Environmental Statement, 2018). The pumping station may only discharge to sea in emergency circumstances when the pumping station is inoperative. No discharge occurs under normal circumstances. Due to the operational restrictions on this outfall, a significant in-combination effect is not predicted (Chapter 17 Marine Environment, paragraph 17.34.9, Environmental Statement, 2018).</p> <p>The Sellafield outfalls extend ~2.1 km from shore into the north-eastern Irish Sea and are located approximately 14.5 km directly south of the Saltom Bay discharge point (~17 km by sea). The Sellafield discharge outfall (at Seascale) is therefore also outside the zone of influence for the WCM discharge (Chapter 17 Marine Environment, paragraph 17.34.7, Environmental Statement, 2018). An in-combination effect is not predicted to occur due to the separation distance (Chapter 17 Marine Environment, paragraph 17.34.11, Environmental Statement, 2018).</p> <p>The United Utilities wastewater treatment works discharge (at Parton, north of Whitehaven) is located approximately 5 km from the proposed discharge point in Saltom Bay. The discharge point of this outfall is therefore also outside the zone of influence for the WCM discharge (Chapter 17 Marine Environment, paragraph 17.34.7, Environmental Statement, 2018). Furthermore, the existing sewage discharge is discharged via diffuser(s) at a distance of ~1.9 km from shore, in the main current flows of the Solway Firth, and has an initial dilution factor of 50, which is generally considered appropriate for</p>		

River Ehen SAC – decommissioning phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>secondary treated sewage effluent. The United Utilities wastewater treatment works discharge is therefore considered to have sufficient initial and secondary mixing to ensure that it will not produce cumulative or in-combination impacts with the Saltom Bay discharge. (Chapter 17 Marine Environment, paragraph 17.34.10, Environmental Statement, 2018).</p> <p>There are no other projects which CCC is aware of in the marine environment in the proximity of the proposed mine that need to be included in an in-combination assessment. The NuGen Moorside development is currently on hold, and timescales, the nature and scope of the project, and its potential impacts are unknown. Therefore, no cumulative impact assessment is provided for this development.</p> <p>It is therefore concluded that the discharge will not have a significant effect on the marine environment, either alone or in combination with other discharges from other plans or projects; predicted effects during the decommissioning phase will be the same as or less than the predicted effects during the construction phase (Chapter 17 Marine Environment, Environmental Statement, sections 17.29.8 to 17.29.11, 17.33.7 and 17.34.7, West Cumbria Mining, 2018).</p> <p>It is concluded that there will be no adverse effect on the integrity of the SAC (through impacts on the populations of the SAC qualifying species or through impacts on supporting habitats or species) through this pathway alone or in combination with other plans or projects.</p>		
8	Deterioration of marine	Potential effect on SAC migratory fish	The proposed development will not impact directly on any part of the SAC; however, impacts on marine water quality are possible as a	Yes	Yes

River Ehen SAC – decommissioning phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
	water quality as a result of sediment-laden surface water run-off during decommissioning, via Pow Beck catchment	populations including impacts on prey availability and deterioration of food resource through surface water discharge and run-off	<p>result of discharges of surface water made from the RLF and Conveyor to the Bellhouse Gill and Pow Beck, which eventually discharges to the sea to the south of St Bees approximately 2.8 km downstream of the development.</p> <p>In the absence of mitigation the release of sediment-laden surface water via the Pow Beck into the marine environment could potentially impact on SAC qualifying features directly (if they are present in the vicinity of the Pow Beck where it discharges to sea at St Bees Beach), for example as a result of habitat deterioration due to sediment-laden water, or indirectly, by impacting on the prey species that SAC qualifying features depend upon.</p> <p>The effects of suspended solids (transported via the Pow Beck) on the marine environment will be fully mitigated through measures that will be adopted during the decommissioning phase at the conveyor and rail loading facility sites (Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, sections 6.2 and 6.3, Flood Risk Assessment and Drainage Strategy, Environmental Statement, West Cumbria Mining, 2018; Sections 5.7 and 5.10 of the Draft Environmental Management Plan - Appendix E to Chapter 5 Project Description, Environmental Statement, West Cumbria Mining, 2018).</p> <p>Bellhouse Gill and an unnamed tributary of the Pow Beck (both ephemeral watercourses) are intersected by the conveyor route. The conveyor will be buried beneath these ephemeral watercourses and during the operation phase the flow regime at these locations will return to pre-development conditions and this is expected to continue during the decommissioning phase. There will therefore be no increases in flow rates or discharge volumes to Pow Beck during the operation phase and this is expected to continue during the</p>		

River Ehen SAC – decommissioning phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>decommissioning phase as well. The conveyor route will remain enclosed, which will minimise the chance of contamination of local watercourses during the decommissioning phase.</p> <p>After construction the conveyor box will be backfilled with low permeability material in a way that will minimise ingress and tracking of surface water along the outside of the box structure. At this point the difference between the flow regimes pre and post construction is expected to be negligible (Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, Flood Risk Assessment and Drainage Strategy, section 6.2.1.2, Environmental Statement, West Cumbria Mining, 2018). This situation is expected to continue during the decommissioning phase as the conveyor will be left in situ.</p> <p>During the decommissioning phase the storage lagoons, wetland, drainage pipes and outfalls to receiving watercourses that serve the RLF will remain.</p> <p>Once the mine is closed the above ground structures on the site will be removed and the land reinstated and planted for ecology and recreation. It is expected that the drainage infrastructure would remain in place and continue to function, although removing the buildings and ceasing operation would reduce the runoff and sediment generation from the site. If all the infrastructure is removed, including the drainage system, then the site would revert to its pre-development state.</p> <p>Discharge rates from the restored site will be reduced compared to the operational phase, as the impermeable surfaces will be removed and replaced by more retentive naturalised catchment.</p>		

River Ehen SAC – decommissioning phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>Dilution effects within Bellhouse Gill and Pow Beck will also reduce the environmental concentrations of any contaminants present (though this is considered unlikely once good practice measures are in place) to the point where they are not predicted to have any significant impact on the marine environment. . Predicted effects during the decommissioning phase will be the same as or less than the predicted effects during the construction phase (Chapter 17 Marine Environment, paragraph 17.29.21 – 17.29.23, Environmental Statement, West Cumbria Mining, 2018).</p> <p>These good practice measures, in conjunction with mixing and dilution effects of the freshwater watercourses, mean that no significant pollution impact on the marine environment is predicted via the Pow Beck pathway (see Chapter 17, Marine Environment, paragraph 17.29.22, Environmental Statement, 2018), indeed any such impact is regarded as negligible. Consequently it is not expected that the discharge to Pow Beck will impact directly or indirectly on SAC populations of qualifying features or their supporting habitats or species.</p> <p>The hydrological assessment has concluded that, with respect to groundwater and surface water, no pathway is considered to exist between the proposed development and any other proposed development (Chapter 12 Hydrology & Hydrogeology, Section 12.8, Environmental Statement, West Cumbria Mining, 2018).</p> <p>As such an in-combination effect with other plans or projects is considered very unlikely, however, to ensure a comprehensive assessment, nearby licensable discharges to sea in the vicinity of the</p>		

River Ehen SAC – decommissioning phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>mouth of Pow Beck have nevertheless been investigated.</p> <p>The zone of influence (ZOI) of the proposed surface water runoff discharge to Saltom Bay has been calculated as approximately 162 m and is over 8 km (by sea) from the mouth of Pow Beck. Hence no in-combination effect is predicted between the two sources of surface water runoff associated with the proposed development.</p> <p>The closest licensed discharge to the mouth of Pow Beck is a United Utilities pumping station located at Nethertown, which has a permit to discharge to sea (permit no. 017470153) approximately 4 km south of the mouth of Pow Beck. However, under the conditions of the permit, the pumping station may only discharge to sea in emergency circumstances when the pumping station is inoperative as a result of e.g. electrical failure or rising main failure. No discharge occurs under normal circumstances. For this reason this discharge has been scoped out of the in-combination impact assessment.</p> <p>The United Utilities WwTW located at Braystones, south of Nethertown, discharges to sea via a long sea outfall (permit no. 017470152). The discharge point of this outfall is located approximately 7 km south from the mouth of Pow Beck and hence any combined effect between it and any discharges made via Pow Beck is very unlikely. Furthermore, the existing sewage discharge is discharged via diffuser(s) at a distance of ~2 km from shore and has an initial dilution factor generally considered appropriate for secondary treated sewage effluent. The existing discharge is therefore considered to have sufficient initial and secondary mixing to ensure that it will not produce cumulative or in-combination impacts with other discharges.</p>		

River Ehen SAC – decommissioning phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>The Sellafield outfalls extend ~2.1 km from shore into the north-eastern Irish Sea and are located approximately 8.8 km from the mouth of Pow Beck and hence, again, it is considered highly unlikely that the two plumes will interact. Furthermore, the two discharges are not similar; the proposed discharges to Pow Beck are ambient temperature freshwater which, with good practice guidelines in place, will not be contaminated, while the Sellafield discharge is a cooling water discharge, i.e. warm seawater. There is therefore no realistic likelihood of in-combination effects between the two discharges.</p> <p>There are no other projects which CCC is aware of in the marine environment in the proximity of the proposed mine that need to be included in an in-combination assessment. The NuGen Moorside development is currently on hold, and timescales, the nature and scope of the project, and its potential impacts are unknown. Therefore, no cumulative impact assessment is provided for this development.</p> <p>It is concluded that there will be no adverse effect on the integrity of the SAC (through impacts on the populations of the SAC qualifying species or through impacts on supporting habitats or species) through this pathway alone or in combination with other plans or projects.</p>		
9	Deterioration of marine water quality as a result of disturbance of contaminated	Potential effect on SAC migratory fish populations including impacts on prey availability and deterioration of food	The proposed development will not impact directly on any part of the SAC; however, impacts on marine water quality are possible as a result of discharges of surface water made from the RLF and Conveyor to the Bellhouse Gill and Pow Beck, which eventually discharges to the sea to the south of St Bees approximately 2.8 km downstream of the development.	Yes	Yes

River Ehen SAC – decommissioning phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
	land and mobilisation of pollutants (including changes in pH, temperature, salinity, and dissolved oxygen) discharged via Pow Beck catchment	<p>resource through:</p> <p>Mobilisation of underground contaminants disturbed</p> <p>Potential for pollution incidents from spillages, leakages etc from stored chemicals, fuel and oils on site.</p>	<p>In the absence of mitigation the release of pollutants into the marine environment could potentially impact on SAC qualifying features directly (if they are present in the vicinity of the Pow Beck where it discharges to sea), for example as a result of toxic effects, or indirectly, by impacting on the prey species that SAC qualifying features depend upon. There are also potential impacts associated with the discharge related to non-toxic inputs. These include the effects of pH, temperature, salinity and dissolved oxygen.</p> <p>During the decommissioning phase, pollution effects will be fully mitigated through the adoption of discharge and control measures at the conveyor and rail loading facility sites (Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, sections 6.2 and 6.3, Flood Risk Assessment and Drainage Strategy, Environmental Statement, West Cumbria Mining, 2018; Sections 5.7 and 5.10 of the Draft Environmental Management Plan - Appendix E to Chapter 5 Project Description, Environmental Statement, West Cumbria Mining, 2018).</p> <p>Bellhouse Gill and an unnamed tributary of the Pow Beck (both ephemeral watercourses) are intersected by the conveyor route. The conveyor will be buried beneath these ephemeral watercourses and during the operation phase the flow regime at these locations will return to pre-development conditions and this is expected to continue during the decommissioning phase. There will therefore be no increases in flow rates or discharge volumes to Pow Beck during the operation phase and this is expected to continue during the decommissioning phase as well. The conveyor route will remain enclosed, which will minimise the chance of contamination of local watercourses during the decommissioning phase.</p>		

River Ehen SAC – decommissioning phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>After construction the conveyor box will be backfilled with low permeability material in a way that will minimise ingress and tracking of surface water along the outside of the box structure. At this point the difference between the flow regimes pre and post construction is expected to be negligible (Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, Flood Risk Assessment and Drainage Strategy, section 6.2.1.2, Environmental Statement, West Cumbria Mining, 2018). This situation is expected to continue during the decommissioning phase as the conveyor will be left in situ.</p> <p>During the decommissioning phase the storage lagoons, wetland, drainage pipes and outfalls to receiving watercourses that serve the RLF will remain.</p> <p>Once the mine is closed the above ground structures on the site will be removed and the land reinstated and planted for ecology and recreation. It is expected that the drainage infrastructure would remain in place and continue to function, although removing the buildings and ceasing operation would reduce the runoff and sediment generation from the site. If all the infrastructure is removed, including the drainage system, then the site would revert to its pre-development state.</p> <p>Discharge rates from the restored site will be reduced compared to the operational phase, as the impermeable surfaces will be removed and replaced by more retentive naturalised catchment.</p> <p>Dilution effects within Bellhouse Gill and Pow Beck will also reduce the environmental concentrations of any contaminants present</p>		

River Ehen SAC – decommissioning phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>(though this is considered unlikely once good practice measures are in place) to the point where they are not predicted to have any significant impact on the marine environment. Predicted effects during the decommissioning phase will be the same as or less than the predicted effects during the construction phase (Chapter 17 Marine Environment, paragraph 17.29.21 – 17.29.23, Environmental Statement, West Cumbria Mining, 2018).</p> <p>The implementation of these good practice measures, in conjunction with mixing and dilution effects of the freshwater watercourses, mean that, no significant pollution impact on the marine environment is predicted via the Pow Beck pathway (see Chapter 17, Marine Environment, paragraph 17.29.22, Environmental Statement, 2018), indeed any such impact is regarded as negligible. Consequently it not expected that the discharge of pollutants to Pow Beck (including changes in pH, temperature, salinity, and dissolved oxygen) will impact directly or indirectly on SAC populations of qualifying features or their supporting habitats or species.</p> <p>The hydrological assessment has concluded that, with respect to groundwater and surface water, no pathway is considered to exist between the proposed development and any other proposed development (Chapter 12 Hydrology & Hydrogeology, Section 12.8, Environmental Statement, West Cumbria Mining, 2018).</p> <p>As such an in-combination effect with other plans or projects is considered very unlikely, however, to ensure a comprehensive assessment, nearby licensable discharges to sea in the vicinity of the mouth of Pow Beck have nevertheless been investigated.</p>		

River Ehen SAC – decommissioning phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>The zone of influence (ZOI) of the proposed surface water runoff discharge to Saltom Bay has been calculated as approximately 162 m and is over 8 km (by sea) from the mouth of Pow Beck. Hence no in-combination effect is predicted between the two sources of surface water runoff associated with the proposed development.</p> <p>The closest licensed discharge to the mouth of Pow Beck is a United Utilities pumping station located at Nethertown, which has a permit to discharge to sea (permit no. 017470153) approximately 4 km south of the mouth of Pow Beck. However, under the conditions of the permit, the pumping station may only discharge to sea in emergency circumstances when the pumping station is inoperative as a result of e.g. electrical failure or rising main failure. No discharge occurs under normal circumstances. For this reason this discharge has been scoped out of the in-combination impact assessment.</p> <p>The United Utilities WwTW located at Braystones, south of Nethertown, discharges to sea via a long sea outfall (permit no. 017470152). The discharge point of this outfall is located approximately 7 km south from the mouth of Pow Beck and hence any combined effect between it and any discharges made via Pow Beck is very unlikely. Furthermore, the existing sewage discharge is discharged via diffuser(s) at a distance of ~2 km from shore and has an initial dilution factor generally considered appropriate for secondary treated sewage effluent. The existing discharge is therefore considered to have sufficient initial and secondary mixing to ensure that it will not produce cumulative or in-combination impacts with other discharges.</p>		

River Ehen SAC – decommissioning phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>The Sellafield outfalls extend ~2.1 km from shore into the north-eastern Irish Sea and are located approximately 8.8 km from the mouth of Pow Beck and hence, again, it is considered highly unlikely that the two plumes will interact. Furthermore, the two discharges are not similar; the proposed discharges to Pow Beck are ambient temperature freshwater which, with good practice guidelines in place, will not be contaminated, while the Sellafield discharge is a cooling water discharge, i.e. warm seawater. There is therefore no realistic likelihood of in-combination effects between the two discharges.</p> <p>There are no other projects which CCC is aware of in the marine environment in the proximity of the proposed mine that need to be included in an in-combination assessment. The NuGen Moorside development is currently on hold, and timescales, the nature and scope of the project, and its potential impacts are unknown. Therefore, no cumulative impact assessment is provided for this development.</p> <p>It is concluded that there will be no adverse effect on the integrity of the SAC (through impacts on the populations of the SAC qualifying species or through impacts on supporting habitats or species) through this pathway alone or in combination with other plans or projects.</p>		
10	Subsidence effects under the terrestrial environment	Subsidence under the terrestrial environment as a result of sub-surface mining activities	<p>No subsidence is predicted during the decommissioning phase as no mining activity will be taking place and any subsidence will have taken place during the operational phase of the development.</p> <p>Please see paragraphs 6.187 et seq in Chapter 6, which provides an assessment of the effects of subsidence.</p>	Yes	Yes

River Ehen SAC – decommissioning phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
11	Subsidence effects under the marine environment	Subsidence under the marine environment as a result of sub-surface mining activities	<p>No subsidence is predicted during the decommissioning phase as no mining activity will be taking place and any subsidence will have taken place during the operational phase of the development.</p> <p>Please see paragraphs 6.187 et seq in Chapter 6, which provides an assessment of the effects of subsidence.</p>	Yes	Yes

River Derwent and Bassenthwaite Lake SAC

- 7.19 The qualifying features of the River Derwent and Bassenthwaite Lake SAC are as follows:
- 7.20 The River Derwent and Bassenthwaite Lake is designated a SAC because it supports internationally important examples of the following Annex I habitats, which is a primary reason for selection of this site: Oligotrophic to mesotrophic standing waters with vegetation of the *Littorelletea uniflorae* and/or of the *Isoëto-Nanojuncetea*.
- 7.21 The site also supports the following Annex I habitat that is present as a qualifying feature, but which is not a primary reason for selection of this site: Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitriche-Batrachion* vegetation.
- 7.22 The River Derwent and Bassenthwaite Lake SAC also supports populations of the following Annex II species that are a primary reason for selection of this site: marsh fritillary butterfly *Euphydryas (Eurodryas, Hypodryas) aurinia*; sea lamprey *Petromyzon marinus*; brook lamprey *Lampetra planeri*; river lamprey *Lampetra fluviatilis*; Atlantic salmon *Salmo salar*; otter *Lutra lutra*; floating water-plantain *Luronium natans*.
- 7.23 The conservation objectives for the River Derwent and Bassenthwaite Lake SAC are as follows:
- Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring;
 - The extent and distribution of qualifying natural habitats and habitats of qualifying species;
 - The structure and function (including typical species) of qualifying natural habitats
 - The structure and function of the habitats of qualifying species
 - The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely
 - The populations of qualifying species; and
 - The distribution of qualifying species within the site.

Construction Phase

Table 8: Impact mechanisms and pathways during the construction phase of the development – River Derwent and Bassenthwaite Lake SAC

River Derwent and Bassenthwaite Lake SAC – construction phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
1	Direct loss of or damage to terrestrial habitat – MMS, RLF/UC	Potential loss or damage of supporting habitat for SAC qualifying features through land-take	The interest features of the River Derwent and Bassenthwaite Lake SAC are aquatic hence there is no impact pathway from loss of or damage to terrestrial habitat. Please see paragraphs 6.8 et seq in Chapter 6, which provide a detailed assessment.	Yes	Yes
2	Disturbance of marine or terrestrial qualifying species (visual/noise/vibration) – MMS/RLF/UC/UM/	Potential for disruption and/or injury to migratory qualifying features through noise/vibration as a result of construction processes e.g. piling/drilling	<u>Visual / human disturbance</u> The interest features of the River Derwent and Bassenthwaite Lake SAC are aquatic hence this impact pathway has no relevance. Please see paragraphs 6.27 et seq in Chapter 6, which provides a detailed assessment. <u>Noise and vibration</u> There is no mechanism by which construction related noise and vibration can impact on the River Derwent and Bassenthwaite Lake SAC. The nearest part of the SAC is 10.03 km north-east of the main mine site and the point at which the River Derwent discharges to the sea is around 13 km to the north of the site at Workington. This is well beyond the limits of any predicted noise and vibration effects. There will be no construction related noise and vibration related impacts on marine receptors as no offshore works or mining activities will take	Yes	Yes

River Derwent and Bassenthwaite Lake SAC – construction phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			place in this phase. Please see paragraphs 6.31 et seq in Chapter 6, which provides a detailed assessment.		
3	Direct loss of or damage to marine habitat or disturbance to marine species from scouring and/or sedimentation from any discharges from the existing discharge pipe into Saltom Bay	Potential effect on migratory populations through: Deterioration of food resource; Reduction in prey availability	The proposed development will not impact directly on any part of the River Derwent and Bassenthwaite Lake SAC. Impacts on marine habitat or disturbance to marine species from scouring and/or sedimentation are possible as a result of discharges of surface water made through the existing sea outfall pipe. The River Derwent enters the sea at Workington, c. 13 km to the north of the development site. This is sufficiently distant that scour / sedimentation related impacts on animal / fish migration linked to the SAC (otter, salmon and sea lamprey are the only qualifying feature that uses the marine environment) are not expected and in any event the surface water will be treated prior to discharge (Chapter 17 Marine Environment, Environmental Statement, paragraph 17.29.19, West Cumbria Mining, 2018). During the remediation of the development site no surface water discharge is likely as areas being worked will be covered to prevent rainwater ingress (where necessary), which will prevent surface water drainage from these areas. For other parts of the site there will be a state of no change (Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, Flood Risk Assessment and Drainage Strategy, section 6.1.4.1, Environmental Statement, West Cumbria Mining, 2018; Chapter 17 Marine Environment, Environmental Statement, section 17.29.6 et	Yes	Yes

River Derwent and Bassenthwaite Lake SAC – construction phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>seq, West Cumbria Mining, 2018). Consequently, during the remediation of the site there is no mechanism by which scouring or sedimentation impacts on the marine environment could occur.</p> <p>During the remaining part of the construction phase, excess surface water runoff will need to be discharged to sea via the existing outfall in Saltom Bay. In periods of heavy rainfall, flows will be attenuated on site through storage (Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, Flood Risk Assessment and Drainage Strategy, section 6.1.4.2 et seq, Environmental Statement, West Cumbria Mining, 2018).</p> <p>However, following heavy rainfall excess surface water runoff will need to be discharged to sea via the existing outfall in Saltom Bay. The discharge pipe runs down the foreshore and terminates in the intertidal zone (it is only fully exposed around low water springs tides).</p> <p>In order to minimise potential scour, the maximum flow rate of the discharge will be limited to 25 l/s, which will only be reached during and following heavy rainfall events. The proposed development will also minimise the potential for scour on the intertidal area around the outfall by limiting, wherever practicable, surface water discharge to when the outlet point is submerged. By only discharging surface water when the outlet point is submerged, the potential for scour at the proposed flow rates will be minimised (Chapter 17 Marine Environment, Environmental Statement, section 17.29.10, West Cumbria Mining, 2018).</p> <p>When the discharge point is exposed (i.e. not submerged), modelling</p>		

River Derwent and Bassenthwaite Lake SAC – construction phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>results indicate that the proposed flow rate would be sufficient to mobilise fine sand material. However, the sediments at the discharge point location consist of coarse sands (and cobbles and boulders), and so any re-suspended particles are likely to settle out very quickly. It is concluded that any effect on water quality and biota will be localised and of minor significance (Chapter 17 Marine Environment, Environmental Statement, section 17.29.9, West Cumbria Mining, 2018).</p> <p>Modelling work has concluded that the Zone of Influence of the discharge into the sea, when combined with the existing leachate discharge, is 162m from the outfall, which means that the River Derwent and Bassenthwaite Lake SAC (which discharges to the sea around 13 km to the north of the site at Workington) and its qualifying features will not be directly impacted (Chapter 17 Marine Environment, Environmental Statement, section 17.34.7 et seq, West Cumbria Mining, 2018). Consequently, as the proposed discharge is not expected to have a significant effect on marine fauna, no significant effect is expected in respect of salmon, otter or lamprey species (the only qualifying features of the SAC that use the marine environment) using the River Derwent estuary, which is c. 13 km to the north of the development site, or when migrating at sea. Similarly, there will be no significant indirect impacts on SAC qualifying features as a result of impacts on prey species.</p> <p>As such, an in-combination effect with other plans or projects is considered very unlikely, however, to ensure a comprehensive assessment, other discharges from other plans and projects have also been considered (if they include a proposed discharge to sea which could combine with the 162m zone of influence from the</p>		

River Derwent and Bassenthwaite Lake SAC – construction phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>Saltom Bay outfall) (Chapter 17 Marine Environment, Environmental Statement, section 17.34.5 et seq, West Cumbria Mining, 2018) and do not affect this conclusion.</p> <p>The zone of influence (ZOI) of the proposed surface water runoff discharge to Saltom Bay has been calculated as approximately 162 m and is over 8 km (by sea) from the mouth of Pow Beck. Hence no in-combination effect is predicted between the two sources of surface water runoff associated with the proposed development.</p> <p>The following licensable discharges to sea are within the vicinity of Saltom Bay and have the potential to interact with the surface water runoff discharges from the Saltom Bay outfall associated with the proposed development (Chapter 17 , paragraph 17.34, of the Environmental Statement):</p> <p>A private sewer discharge outfall is located approximately 350 m from the proposed WCM discharge point and it is permitted to discharge no more than 0.2 m³ per day. The permit associated with this discharge states that the discharge must have no adverse visible effect on the receiving environment. Modelling shows that the private sewer discharge from a pharmacy in Kells (to Saltom Bay) is outside the zone of influence for the WCM discharge (Chapter 17 Marine Environment, paragraph 17.34.7, Environmental Statement, 2018). This is the case even when the outfall is fully exposed at low tide. Due to the separation distance and the very small volume of this discharge, a significant in-combination effect is not predicted to occur (Chapter 17 Marine Environment, paragraph 17.34.8, Environmental Statement, 2018).</p>		

River Derwent and Bassenthwaite Lake SAC – construction phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>A United Utilities pumping station discharge (to Saltom Bay) is also outside the zone of influence for the WCM discharge (Chapter 17 Marine Environment, paragraph 17.34.7, Environmental Statement, 2018). The pumping station may only discharge to sea in emergency circumstances when the pumping station is inoperative. No discharge occurs under normal circumstances. Due to the operational restrictions on this outfall, a significant in-combination effect is not predicted (Chapter 17 Marine Environment, paragraph 17.34.9, Environmental Statement, 2018).</p> <p>The Sellafield outfalls extend ~2.1 km from shore into the north-eastern Irish Sea and are located approximately 14.5 km directly south of the Saltom Bay discharge point (~17 km by sea). The Sellafield discharge outfall (at Seascale) is therefore also outside the zone of influence for the WCM discharge (Chapter 17 Marine Environment, paragraph 17.34.7, Environmental Statement, 2018). An in-combination effect is not predicted to occur due to the separation distance (Chapter 17 Marine Environment, paragraph 17.34.11, Environmental Statement, 2018).</p> <p>The United Utilities wastewater treatment works discharge (at Parton, north of Whitehaven) is located approximately 5 km from the proposed discharge point in Saltom Bay. The discharge point of this outfall is therefore also outside the zone of influence for the WCM discharge (Chapter 17 Marine Environment, paragraph 17.34.7, Environmental Statement, 2018). Furthermore, the existing sewage discharge is discharged via diffuser(s) at a distance of ~1.9 km from shore, in the main current flows of the Solway Firth, and has an initial dilution factor of 50, which is generally considered appropriate for</p>		

River Derwent and Bassenthwaite Lake SAC – construction phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>secondary treated sewage effluent. The United Utilities wastewater treatment works discharge is therefore considered to have sufficient initial and secondary mixing to ensure that it will not produce cumulative or in-combination impacts with the Saltom Bay discharge. (Chapter 17 Marine Environment, paragraph 17.34.10, Environmental Statement, 2018).</p> <p>There are no other projects which CCC is aware of in the marine environment in the proximity of the proposed mine that need to be included in an in-combination assessment. The NuGen Moorside development is currently on hold, and timescales, the nature and scope of the project, and its potential impacts are unknown. Therefore, no cumulative impact assessment is provided for this development. alone or 'in combination' with any other plans or projects.</p> <p>It is therefore concluded that the discharge will not have a significant effect on the marine environment, either alone or in combination with other discharges from other plans or projects (Chapter 17 Marine Environment, Environmental Statement, section 17.29.8 to 17.29.11, West Cumbria Mining, 2018).</p> <p>It is concluded that there will be no adverse effect on the integrity of the SAC (through impacts on the populations of the SAC qualifying species or through impacts on supporting habitats or species) through this pathway alone or in combination with other plans or projects.</p>		
4	Direct loss of or damage to marine habitat	Potential effect on migratory populations through:	The proposed development will not impact directly on any part of the River Derwent and Bassenthwaite Lake SAC, however impacts on marine habitat or disturbance to marine species from scouring and/or	Yes	Yes

River Derwent and Bassenthwaite Lake SAC – construction phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
	or disturbance to marine species from scouring and/or sedimentation from any discharges via Pow Beck	Deterioration of food resource; Reduction in prey availability	<p>sedimentation are possible at the point where Pow Beck discharges to the sea to the south of St Bees (approximately 2.8 km downstream of the development), as a result of the discharge of surface water made to connected watercourses from the conveyor and RLF.</p> <p>Surface water flows, if uncontrolled, have the potential to entrain sediments and contaminants generated by the construction of the proposed development, which may have negative impacts on marine water quality and marine biota. In addition, the flows themselves, if increased, will have the potential to cause scouring around the mouth of Pow Beck. The River Derwent enters the sea at Workington, c. 18 km to the north of the Pow Beck. This is sufficiently distant from the Pow Beck that scour / sedimentation related impacts on fish migration linked to the SAC are not expected (Chapter 17 Marine Environment, Environmental Statement, paragraph 17.29.19, West Cumbria Mining, 2018). However, this assessment takes a highly precautionary approach, and assumes that there may be a potential for scouring and/or sedimentation to impact otter, salmon and/or sea lamprey (the only qualifying features of the SAC which use the marine environment).</p> <p>In order to minimise potential scour, discharge and control measures will be adopted at the conveyor and rail loading facility sites (Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, sections 6.2 and 6.3, Flood Risk Assessment and Drainage Strategy, Environmental Statement, West Cumbria Mining, 2018; Sections 5.7 and 5.10 of the Draft Environmental Management Plan - Appendix E to Chapter 5 Project Description, Environmental Statement, West Cumbria Mining, 2018).</p> <p>Bellhouse Gill and an unnamed tributary of the Pow Beck (both</p>		

River Derwent and Bassenthwaite Lake SAC – construction phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>ephemeral watercourses) are intersected by the conveyor route. The conveyor will be buried beneath these two ephemeral watercourses; during the construction phase, the watercourses will be diverted around the construction area. There will therefore be no increases in flow rates or discharge volumes to Pow Beck, and hence no impacts at St Bees beach due to scour are predicted.</p> <p>During the construction phase, surface water runoff at the rail loading facility (RLF) site will be retained on-site in attenuation lagoons. Surface discharges to Pow Beck will be at a reduced rate compared to the current greenfield runoff rates. Consequently, impacts associated with scour at the mouth of the Pow Beck are therefore not predicted to occur (Chapter 17 Marine Environment, Environmental Statement, sections 17.29.20 to 17.29.23, West Cumbria Mining, 2018).</p> <p>It is concluded that there will be no adverse effect on the integrity of the SAC (through impacts on the populations of the SAC qualifying species or through impacts on supporting habitats or species) through this pathway alone or in combination with other plans or projects</p> <p>In relation to the risk of scouring there is predicted to be no impact at the point where the Pow Beck discharges to the sea from WCM's project and so no risk of any in combination impact.</p>		
5	Dust and other airborne contamination of marine and terrestrial	Potential effect on populations of qualifying species through:	<p>Please see paragraphs 6.131 et seq in Chapter 6, which provide a detailed assessment of the effects of dust.</p> <p>Please see paragraphs 6.135 et seq in Chapter 6, which provide a detailed assessment of the effects of NOx.</p>	Yes	Yes

River Derwent and Bassenthwaite Lake SAC – construction phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
	habitats – MMS/RLF/UC	Deterioration of food resource; Reduction in prey availability	Please see paragraphs 6.139 et seq in Chapter 6, which provide a detailed assessment of the effects of N deposition. It is important to note that the analysis of air quality impacts presented in the above sections represents, as is legally required, a cumulative assessment of the proposed development (i.e. in combination with other plans and projects). This covers dust, traffic, and other operational controlled emissions and is explained in detail in the air quality assessment (Chapter 15 Air Quality, section 15.7, paragraph 15.7.1 - 15.7.4 [dust], paragraph 15.7.5 – 15.7.10 [traffic], paragraph 15.7.11 – 15.7.12 [controlled emissions], Environmental Statement, 2018).		
6	Deterioration of marine water quality as a result of sediment-laden surface water run-off during remediation and construction – via the Saltom Bay outfall	Potential effect on qualifying features including impacts on prey availability and deterioration of food resource through: Escape of sediment-entrained surface water during construction works.	The proposed development will not impact directly on any part of the River Derwent and Bassenthwaite Lake SAC. Impacts on marine habitat or disturbance to marine species from sediment-laden surface water are possible as a result of made through the existing sea outfall pipe. The River Derwent discharges to the sea at Workington c.13 km to the north of the site. This is sufficiently distant that water quality related impacts on animal movement or fish migration linked to the SAC (salmon, otter and lamprey species are qualifying features of the SAC) are not expected and in any event the surface water will be settled prior to discharge. Prior to the main construction period it is planned that a 6 month remediation phase will be required to treat pockets of contamination which may remain in areas of the site. During the remediation works,	Yes	Yes

River Derwent and Bassenthwaite Lake SAC – construction phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>working areas will be fully covered to prevent rainwater ingress. This will ensure that no sediment is mobilised or transported by surface water. Areas of the site which are not being remediated will continue to drain as they do currently (Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, Flood Risk Assessment and Drainage Strategy, Section 6.1.4.1, Environmental Statement, West Cumbria Mining, 2018).</p> <p>Consequently no significant effects from sediment laden water are expected on the marine environment during this remediation phase (Chapter 17 Marine Environment, paragraph 17.29.6, Environmental Statement, West Cumbria Mining, 2018).</p> <p>In the absence of mitigation the release of sediment-laden surface water into the marine environment could potentially impact on SAC qualifying features directly (if they are present in the vicinity of the discharge pipe), for example as a result of habitat deterioration due to sedimentation, or indirectly, by impacting on the prey species that SAC qualifying features depend upon.</p> <p>However, the effects of suspended solids on the marine environment will be fully mitigated during the construction phase of the development through best practice measures that will be adopted by the appointed contractor. Temporary settlement lagoons will be installed to collect surface water prior to discharge to remove potential suspended solids and ensure that discharge permit levels are met (Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, Flood Risk Assessment and Drainage Strategy, Section 6.1.4.2, Environmental Statement, West Cumbria Mining, 2018). Water which has passed through oil and silt traps will be discharged using the</p>		

River Derwent and Bassenthwaite Lake SAC – construction phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>existing outfall. Control measures including standard construction site environmental management (Sections 5.7 and 5.10 of the Draft Environmental Management Plan - Appendix E to Chapter 5 Project Description, Environmental Statement, West Cumbria Mining, 2018) will be implemented.</p> <p>Discharges during the construction phase will be temporary in nature, i.e. they will only occur for the duration of the construction period, which is expected to be about 2 years, and at times when rainfall cannot be used in the construction processes (for example concrete mixing, damping down of roads and stockpiles etc).</p> <p>Modelling work has concluded that the Zone of Influence of the discharge into the sea, when combined with the existing leachate discharge, is 162m from the outfall, which means that the River Derwent and Bassenthwaite Lake SAC (which discharges to the sea around 13 km to the north of the site at Workington) and its qualifying features will not be directly impacted (Chapter 17 Marine Environment, Environmental Statement, section 17.34.7 et seq, West Cumbria Mining, 2018). The discharge will be at a maximum flow rate of 25 l/s (Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, Flood Risk Assessment and Drainage Strategy, section 6.1.4.2 et seq, Environmental Statement, West Cumbria Mining, 2018). As the proposed discharge is not expected to have a significant effect on marine fauna, no indirect impacts on SAC qualifying features are expected either, e.g. as a result of impacts on prey species.</p> <p>The proposed mitigation measures and the maximum discharge rate (together with rapid mixing and dispersal in the marine environment) will ensure that the effects of the discharge are limited in their extent. No significant effects are likely on the marine environment (Chapter</p>		

River Derwent and Bassenthwaite Lake SAC – construction phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>17 Marine Environment, paragraph 17.29.11, Environmental Statement, West Cumbria Mining, 2018), indeed any such impact is regarded as negligible. Consequently it is not expected that the discharge of sediment laden surface water will impact directly or indirectly on salmon, otter, or lamprey species (the only qualifying features of the SAC that use the marine environment) using the River Derwent estuary, which is c. 13 km to the north of the development site.</p> <p>The hydrological assessment has concluded that, with respect to groundwater and surface water, no pathway is considered to exist between the proposed development and any other proposed development (Chapter 12 Hydrology & Hydrogeology, Section 12.8, Environmental Statement, West Cumbria Mining, 2018). As such, an in-combination effect with other plans or projects is considered very unlikely, however, to ensure a comprehensive assessment, other discharges from other plans and projects have also been considered (if they include a proposed discharge to sea which could combine with the 162m zone of influence from the Saltom Bay outfall) (Chapter 17 Marine Environment, Environmental Statement, section 17.34.1 et seq, West Cumbria Mining, 2018).</p> <p>The zone of influence (ZOI) of the proposed surface water runoff discharge to Saltom Bay has been calculated as approximately 162 m and is over 8 km (by sea) from the mouth of Pow Beck. Hence no in-combination effect is predicted between the two sources of surface water runoff associated with the proposed development. The following licensable discharges to sea are within the vicinity of Saltom Bay and have the potential to interact with the surface water runoff discharges from the Saltom Bay outfall associated with the proposed</p>		

River Derwent and Bassenthwaite Lake SAC – construction phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>development (Chapter 17 , paragraph 17.34, of the Environmental Statement:</p> <p>A private sewer discharge outfall is located approximately 350 m from the proposed WCM discharge point and it is permitted to discharge no more than 0.2 m³ per day. The permit associated with this discharge states that the discharge must have no adverse visible effect on the receiving environment. Modelling shows that the private sewer discharge from a pharmacy in Kells (to Saltom Bay) is outside the zone of influence for the WCM discharge (Chapter 17 Marine Environment, paragraph 17.34.7, Environmental Statement, 2018). This is the case even when the outfall is fully exposed at low tide. Due to the separation distance and the very small volume of this discharge, a significant in-combination effect is not predicted to occur (Chapter 17 Marine Environment, paragraph 17.34.8, Environmental Statement, 2018).</p> <p>A United Utilities pumping station discharge (to Saltom Bay) is also outside the zone of influence for the WCM discharge (Chapter 17 Marine Environment, paragraph 17.34.7, Environmental Statement, 2018). The pumping station may only discharge to sea in emergency circumstances when the pumping station is inoperative. No discharge occurs under normal circumstances. Due to the operational restrictions on this outfall, a significant in-combination effect is not predicted (Chapter 17 Marine Environment, paragraph 17.34.9, Environmental Statement, 2018).</p> <p>The Sellafield outfalls extend ~2.1 km from shore into the north-eastern Irish Sea and are located approximately 14.5 km directly south of the Saltom Bay discharge point (~17 km by sea). The</p>		

River Derwent and Bassenthwaite Lake SAC – construction phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>Sellafield discharge outfall (at Seascale) is therefore also outside the zone of influence for the WCM discharge (Chapter 17 Marine Environment, paragraph 17.34.7, Environmental Statement, 2018). An in-combination effect is not predicted to occur due to the separation distance (Chapter 17 Marine Environment, paragraph 17.34.11, Environmental Statement, 2018).</p> <p>The United Utilities wastewater treatment works discharge (at Parton, north of Whitehaven) is located approximately 5 km from the proposed discharge point in Saltom Bay. The discharge point of this outfall is therefore also outside the zone of influence for the WCM discharge (Chapter 17 Marine Environment, paragraph 17.34.7, Environmental Statement, 2018). Furthermore, the existing sewage discharge is discharged via diffuser(s) at a distance of ~1.9 km from shore, in the main current flows of the Solway Firth, and has an initial dilution factor of 50, which is generally considered appropriate for secondary treated sewage effluent. The United Utilities wastewater treatment works discharge is therefore considered to have sufficient initial and secondary mixing to ensure that it will not produce cumulative or in-combination impacts with the Saltom Bay discharge. (Chapter 17 Marine Environment, paragraph 17.34.10, Environmental Statement, 2018).</p> <p>There are no other projects which CCC is aware of in the marine environment in the proximity of the proposed mine that need to be included in an in-combination assessment. The NuGen Moorside development is currently on hold, and timescales, the nature and scope of the project, and its potential impacts are unknown. Therefore, no cumulative impact assessment is provided for this development.</p>		

River Derwent and Bassenthwaite Lake SAC – construction phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>It is therefore concluded that the discharge will not have a significant effect on the marine environment, either alone or in combination with other discharges from other plans or projects (Chapter 17 Marine Environment, Environmental Statement, sections 17.29.8 to 17.29.11 and 17.34.7, West Cumbria Mining, 2018).</p> <p>It is concluded that there will be no adverse effect on the integrity of the SAC (through impacts on the populations of the SAC qualifying species or through impacts on supporting habitats or species) through this pathway alone or in combination with other plans or projects.</p>		
7	<p>Deterioration of marine water quality as a result of disturbance of contaminated land and mobilisation of pollutants during construction (including remediation works) on brownfield land (including changes in pH, temperature, salinity, and</p>	<p>Potential effect on qualifying features including impacts on prey availability and deterioration of food resource through:</p> <p>Mobilisation of underground contaminants disturbed during remediation works</p> <p>Potential for pollution incidents from spillages, leakages etc from stored chemicals, fuel and oils on site.</p>	<p>The proposed development will not impact directly on any part of the River Derwent and Bassenthwaite Lake SAC. Impacts on marine water quality are possible as a result of discharges of surface water made through the existing sea outfall pipe.</p> <p>The River Derwent discharges to the sea at Workington c.13 km to the north of the site. This is sufficiently distant that water quality related impacts on animal movement or fish migration linked to the SAC (salmon, otter, and lamprey species are qualifying features of the SAC) are not expected and in any event the surface water will be treated prior to discharge.</p> <p>Prior to the main construction period it is planned that a 6 month remediation phase will be required to treat pockets of contamination which may remain in areas of the site.</p> <p>In the absence of mitigation the potential release of pollutants into the marine environment could potentially impact on SAC qualifying features directly (if they are present in the vicinity of the discharge</p>	Yes	Yes

River Derwent and Bassenthwaite Lake SAC – construction phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
	dissolved oxygen) discharged via Saltom Bay outfall		<p>pipe), for example as a result of toxic effects, or indirectly, by impacting on the prey species that SAC qualifying features depend upon.</p> <p>There are potential impacts associated with the discharge and these are related to non-toxic inputs. These include the effects of pH, temperature, salinity and dissolved oxygen. The marine assessment has concluded that the proposed discharge of surface water into the marine environment is not likely to have a significant effect on pH, salinity, water temperature of dissolved oxygen (Chapter 17 Marine Environment, Environmental Statement, West Cumbria Mining, 2018, paragraphs 17.29.12 [pH], 17.29.14-.17 [salinity], 17.29.13 [water temperature], 17.29.18 [dissolved oxygen]).</p> <p>Pollution effects during the construction phase of the development (including remediation works) will be fully mitigated through best practice measures that will be adopted by the appointed contractor. This includes the collection and settlement of surface water and the adoption of best practice pollution prevention measures (Draft Environmental Management Plan - Appendix E to Chapter 5 Project Description, Sections 5.7 and 5.10, Environmental Statement, West Cumbria Mining, 2018).</p> <p>During the remediation works, working areas will be fully covered to prevent rainwater ingress. This will ensure that no contaminants are mobilised or transported by surface water. Areas of the site which are not being remediated will continue to drain as they do currently (Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, Flood Risk Assessment and Drainage Strategy, Section 6.1.4.1, Environmental Statement, West Cumbria Mining, 2018).</p>		

River Derwent and Bassenthwaite Lake SAC – construction phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>Once the remediation phase is complete, there will be no legacy contaminants on site. Consequently there will be no mechanism whereby legacy contaminants could be discharged into the marine environment.</p> <p>Discharges during the construction phase will be temporary in nature, i.e. they will only occur for the duration of the construction period, which is expected to be about 2 years, and at times when rainfall cannot be used in the construction processes (for example concrete mixing, damping down of roads and stockpiles etc). Modelling work has concluded that the Zone of Influence of the discharge into the sea, when combined with the existing leachate discharge, is 162m from the outfall, which means that the River Derwent and Bassenthwaite Lake SAC (which discharges to the sea around 13 km to the north of the site at Workington) and its qualifying features will not be directly impacted (Chapter 17 Marine Environment, Environmental Statement, section 17.34.7 et seq, West Cumbria Mining, 2018). The discharge will be at a maximum flow rate of 25 l/s (Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, Flood Risk Assessment and Drainage Strategy, section 6.1.4.2 et seq, Environmental Statement, West Cumbria Mining, 2018). As the proposed discharge is not expected to have a significant effect on marine fauna, no indirect impacts on SAC qualifying features are expected either, e.g. as a result of impacts on prey species.</p> <p>The proposed mitigation measures and the maximum discharge rate (together with rapid mixing and dispersal in the marine environment) will ensure that the effects of the discharge are limited in their extent. No significant effects are likely on the marine environment (Chapter</p>		

River Derwent and Bassenthwaite Lake SAC – construction phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>17 Marine Environment, paragraph 17.29.6, Environmental Statement, West Cumbria Mining, 2018) indeed any such impact is regarded as negligible. Consequently it is not expected that the discharge of pollutants (including changes in pH, temperature, salinity, and dissolved oxygen) will impact directly or indirectly on otter, salmon or lamprey species (the only qualifying features of the SAC that use the marine environment) using the River Derwent estuary, which is c. 13 km to the north of the development site.</p> <p>The hydrological assessment has concluded that, with respect to groundwater and surface water, no pathway is considered to exist between the proposed development and any other proposed development (Chapter 12 Hydrology & Hydrogeology, Section 12.8, Environmental Statement, West Cumbria Mining, 2018).</p> <p>As such, an in-combination effect with other plans or projects is considered very unlikely, however, to ensure a comprehensive assessment, other discharges from other plans and projects have also been considered (if they include a proposed discharge to sea which could combine with the 162m zone of influence from the Saltom Bay outfall) (Chapter 17 Marine Environment, Environmental Statement, section 17.34.1 et seq, West Cumbria Mining, 2018).</p> <p>The zone of influence (ZOI) of the proposed surface water runoff discharge to Saltom Bay has been calculated as approximately 162 m and is over 8 km (by sea) from the mouth of Pow Beck. Hence no in-combination effect is predicted between the two sources of surface water runoff associated with the proposed development.</p> <p>The following licensable discharges to sea are within the vicinity of</p>		

River Derwent and Bassenthwaite Lake SAC – construction phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>Saltom Bay and have the potential to interact with the surface water runoff discharges from the Saltom Bay outfall associated with the proposed development (Chapter 17 , paragraph 17.34, of the Environmental Statement):</p> <p>A private sewer discharge outfall is located approximately 350 m from the proposed WCM discharge point and it is permitted to discharge no more than 0.2 m³ per day. The permit associated with this discharge states that the discharge must have no adverse visible effect on the receiving environment. Modelling shows that the private sewer discharge from a pharmacy in Kells (to Saltom Bay) is outside the zone of influence for the WCM discharge (Chapter 17 Marine Environment, paragraph 17.34.7, Environmental Statement, 2018). This is the case even when the outfall is fully exposed at low tide. Due to the separation distance and the very small volume of this discharge, a significant in-combination effect is not predicted to occur (Chapter 17 Marine Environment, paragraph 17.34.8, Environmental Statement, 2018).</p> <p>A United Utilities pumping station discharge (to Saltom Bay) is also outside the zone of influence for the WCM discharge (Chapter 17 Marine Environment, paragraph 17.34.7, Environmental Statement, 2018). The pumping station may only discharge to sea in emergency circumstances when the pumping station is inoperative. No discharge occurs under normal circumstances. Due to the operational restrictions on this outfall, a significant in-combination effect is not predicted (Chapter 17 Marine Environment, paragraph 17.34.9, Environmental Statement, 2018).</p> <p>The Sellafield outfalls extend ~2.1 km from shore into the north-</p>		

River Derwent and Bassenthwaite Lake SAC – construction phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>eastern Irish Sea and are located approximately 14.5 km directly south of the Saltom Bay discharge point (~17 km by sea). The Sellafeld discharge outfall (at Seascale) is therefore also outside the zone of influence for the WCM discharge (Chapter 17 Marine Environment, paragraph 17.34.7, Environmental Statement, 2018). An in-combination effect is not predicted to occur due to the separation distance (Chapter 17 Marine Environment, paragraph 17.34.11, Environmental Statement, 2018).</p> <p>The United Utilities wastewater treatment works discharge (at Parton, north of Whitehaven) is located approximately 5 km from the proposed discharge point in Saltom Bay. The discharge point of this outfall is therefore also outside the zone of influence for the WCM discharge (Chapter 17 Marine Environment, paragraph 17.34.7, Environmental Statement, 2018). Furthermore, the existing sewage discharge is discharged via diffuser(s) at a distance of ~1.9 km from shore, in the main current flows of the Solway Firth, and has an initial dilution factor of 50, which is generally considered appropriate for secondary treated sewage effluent. The United Utilities wastewater treatment works discharge is therefore considered to have sufficient initial and secondary mixing to ensure that it will not produce cumulative or in-combination impacts with the Saltom Bay discharge. (Chapter 17 Marine Environment, paragraph 17.34.10, Environmental Statement, 2018).</p> <p>There are no other projects which CCC is aware of in the marine environment in the proximity of the proposed mine that need to be included in an in-combination assessment. The NuGen Moorside development is currently on hold, and timescales, the nature and scope of the project, and its potential impacts are unknown.</p>		

River Derwent and Bassenthwaite Lake SAC – construction phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>Therefore, no cumulative impact assessment is provided for this development.</p> <p>It is concluded that there will be no adverse effect on the integrity of the SAC (through impacts on the populations of the SAC qualifying species or through impacts on supporting habitats or species) through this pathway alone or in combination with other plans or projects.</p>		
8	Deterioration of marine water quality as a result of sediment-laden surface water run-off during construction, via Pow Beck catchment	<p>Potential effect on qualifying features including impacts on prey availability and deterioration of food resource through:</p> <p>Construction site surface water discharge and run-off</p>	<p>The proposed development will not impact directly on any part of the River Derwent and Bassenthwaite Lake SAC, however, impacts on marine water quality are possible as a result of discharges of surface water made from the RLF and Conveyor to the Bellhouse Gill and Pow Beck, which eventually discharges to the sea to the south of St Bees approximately 2.8 km downstream of the development</p> <p>The River Derwent enters the sea at Workington, c. 18 km to the north of the Pow Beck. This is sufficiently distant that impacts on animal movement or fish migration linked to the SAC (salmon, otter, and lamprey species are qualifying features of the SAC) are not expected as a result of sediment laden surface water, and in any event the surface water will be settled prior to discharge (Chapter 17 Marine Environment, Environmental Statement, paragraph 17.29.19, West Cumbria Mining, 2018).</p> <p>In the absence of mitigation the release of sediment-laden surface water into the marine environment could potentially impact on SAC qualifying features directly (if they are present in the vicinity of Pow Beck where it discharges into the sea), for example as a result of habitat deterioration due to sediment-laden water, or indirectly, by impacting on the prey species that SAC qualifying features depend</p>	Yes	Yes

River Derwent and Bassenthwaite Lake SAC – construction phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>upon.</p> <p>The effects of suspended solids on the marine environment will be fully mitigated through measures that will be adopted during the construction phase of the development. This includes the collection and treatment of surface water and the adoption of best practice pollution prevention measures (Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, section 6.2.1.1, Flood Risk Assessment and Drainage Strategy, Environmental Statement, West Cumbria Mining, 2018; Chapter 5 Project Description, Appendix E, Draft Environmental Management Plan, sections 5.6 and 5.7).</p> <p>Details of the discharge and control measures at the conveyor and rail loading facility sites are described in Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, Flood Risk Assessment and Drainage Strategy, Sections 6.2 and 6.3, Environmental Statement, West Cumbria Mining, 2018.</p> <p>Bellhouse Gill and an unnamed tributary of the Pow Beck (both ephemeral watercourses) are intersected by the conveyor route. The conveyor will be buried beneath these ephemeral watercourses. Following construction, the flow regime at these locations will return to pre-development conditions.</p> <p>During the construction phase, the watercourses will be diverted around the construction area to allow for the continuation of flow over this time. There will therefore be no increases in flow rates or discharge volumes to Pow Beck. Water pollution controls at the conveyor site will minimise sediment release to Pow Beck and hence the marine environment.</p>		

River Derwent and Bassenthwaite Lake SAC – construction phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>It is proposed to create a temporary lagoon for the storage and settlement of surface water from the Conveyor and Rail Loading Facility during the construction phase (Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, Flood Risk Assessment and Drainage Strategy, Table 6.1, Environmental Statement, West Cumbria Mining, 2018).</p> <p>Dilution effects within Bellhouse Gill and Pow Beck will also reduce the environmental concentrations of any contaminants present (though this is considered unlikely once good practice measures are in place) to the point where they are not predicted to have any significant impact on the marine environment (Chapter 17 Marine Environment, paragraph 17.29.21 & .22, Environmental Statement, West Cumbria Mining, 2018).</p> <p>Furthermore, discharges during the construction phase will be temporary in nature, i.e. they will only occur for the duration of the construction period, which is expected to be about 2 years, and at times when rainfall cannot be used in the construction processes (for example concrete mixing, damping down of roads and stockpiles etc).</p> <p>The mitigation measures (together with rapid mixing and dispersal in the marine environment) will ensure that the effects of the discharge are limited in their extent. No significant pollution impact on the marine environment is predicted via the Pow Beck pathway (Chapter 17 Marine Environment, paragraph 17.29.22, Environmental Statement, West Cumbria Mining, 2018), indeed any such impact is regarded as negligible. Consequently it is not expected that the discharge of sediment laden surface water will impact directly or</p>		

River Derwent and Bassenthwaite Lake SAC – construction phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>indirectly on salmon, otter, or lamprey species (the only qualifying features of the SAC that use the marine environment) using the River Derwent estuary, which is c. 13 km to the north of the development site.</p> <p>The hydrological assessment has concluded that, with respect to groundwater and surface water, no pathway is considered to exist between the proposed development and any other proposed development (Chapter 12 Hydrology & Hydrogeology, Section 12.8, Environmental Statement, West Cumbria Mining, 2018).</p> <p>As such an in-combination effect with other plans or projects is considered very unlikely, however, to ensure a comprehensive assessment, nearby licensable discharges to sea in the vicinity of the mouth of Pow Beck have nevertheless been investigated.</p> <p>The zone of influence (ZOI) of the proposed surface water runoff discharge to Saltom Bay has been calculated as approximately 162 m and is over 8 km (by sea) from the mouth of Pow Beck. Hence no in-combination effect is predicted between the two sources of surface water runoff associated with the proposed development.</p> <p>The closest licensed discharge to the mouth of Pow Beck is a United Utilities pumping station located at Nethertown, which has a permit to discharge to sea (permit no. 017470153) approximately 4 km south of the mouth of Pow Beck. However, under the conditions of the permit, the pumping station may only discharge to sea in emergency circumstances when the pumping station is inoperative as a result of e.g. electrical failure or rising main failure. No discharge occurs under normal circumstances. For this reason this discharge has been</p>		

River Derwent and Bassenthwaite Lake SAC – construction phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>scoped out of the in-combination impact assessment.</p> <p>The United Utilities WwTW located at Braystones, south of Nethertown, discharges to sea via a long sea outfall (permit no. 017470152). The discharge point of this outfall is located approximately 7 km south from the mouth of Pow Beck and hence any combined effect between it and any discharges made via Pow Beck is very unlikely. Furthermore, the existing sewage discharge is discharged via diffuser(s) at a distance of ~2 km from shore and has an initial dilution factor generally considered appropriate for secondary treated sewage effluent. The existing discharge is therefore considered to have sufficient initial and secondary mixing to ensure that it will not produce cumulative or in-combination impacts with other discharges.</p> <p>The Sellafield outfalls extend ~2.1 km from shore into the north-eastern Irish Sea and are located approximately 8.8 km from the mouth of Pow Beck and hence, again, it is considered highly unlikely that the two plumes will interact. Furthermore, the two discharges are not similar; the proposed discharges to Pow Beck are ambient temperature freshwater which, with good practice guidelines in place, will not be contaminated, while the Sellafield discharge is a cooling water discharge, i.e. warm seawater. There is therefore no realistic likelihood of in-combination effects between the two discharges.</p> <p>There are no other projects which CCC is aware of in the marine environment in the proximity of the proposed mine that need to be included in an in-combination assessment. The NuGen Moorside development is currently on hold, and timescales, the nature and scope of the project, and its potential impacts are unknown.</p>		

River Derwent and Bassenthwaite Lake SAC – construction phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>Therefore, no cumulative impact assessment is provided for this development.</p> <p>It is concluded that there will be no adverse effect on the integrity of the SAC (through impacts on the populations of the SAC qualifying species or through impacts on supporting habitats or species) through this pathway alone or in combination with other plans or projects.</p>		
9	Deterioration of marine water quality as a result of disturbance of contaminated land and mobilisation of pollutants during construction (including remediation works) on brownfield land (including changes in pH, temperature, salinity, and dissolved oxygen) discharged via	<p>Potential effect on qualifying features including impacts on prey availability and deterioration of food resource through:</p> <p>Mobilisation of underground contaminants disturbed during remediation works</p> <p>Potential for pollution incidents from spillages, leakages etc from stored chemicals, fuel and oils on site.</p>	<p>The proposed development will not impact directly on any part of the River Derwent and Bassenthwaite Lake SAC however, impacts on marine water quality are possible as a result of discharges of surface water made from the RLF and Conveyor to the Bellhouse Gill and Pow Beck, which eventually discharges to the sea to the south of St Bees approximately 2.8 km downstream of the development.</p> <p>The River Derwent enters the sea at Workington, c. 18 km to the north of the Pow Beck. This is sufficiently distant that direct impacts on SAC qualifying features, for example as a result of toxic effects, (i.e. impacts on salmon, otter, and lamprey species if they are present in the vicinity of the Pow Beck where it discharges to the sea), or indirectly, by impacting on the prey species that SAC qualifying features depend upon. In any event the surface water will be settled prior to discharge (Chapter 17 Marine Environment, Environmental Statement, paragraph 17.29.19, West Cumbria Mining, 2018).</p> <p>In the absence of mitigation the release of pollutants into the marine environment could potentially impact on SAC qualifying features directly (if they are present in the vicinity of the Pow Beck where it discharges into the sea), for example as a result of toxic effects, or indirectly, by impacting on the prey species that SAC qualifying</p>	Yes	Yes

River Derwent and Bassenthwaite Lake SAC – construction phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
	Pow Beck catchment		<p>features depend upon.</p> <p>There are also potential impacts associated with the discharge and these are related to non-toxic inputs. These include the effects of pH, temperature, salinity and dissolved oxygen.</p> <p>Pollution effects during the construction phase of the development will be fully mitigated through the adoption of best practice pollution prevention measures that will be adopted by the appointed contractor. This includes the collection and settlement of surface water and the adoption of best practice pollution prevention measures (Draft Environmental Management Plan - Appendix E to Chapter 5 Project Description, Sections 5.7 and 5.10, Environmental Statement, West Cumbria Mining, 2018).</p> <p>Details of the discharge and control measures at the conveyor and rail loading facility sites are described in Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, Flood Risk Assessment and Drainage Strategy, Sections 6.2 and 6.3, Environmental Statement, West Cumbria Mining, 2018.</p> <p>Bellhouse Gill and an unnamed tributary of the Pow Beck (both ephemeral watercourses) are intersected by the conveyor route. The conveyor will be buried beneath these ephemeral watercourses; following construction, the flow regime at these locations will return to pre-development conditions.</p> <p>During the construction phase, the watercourses will be diverted around the construction area to allow for the continuation of flow over this time. There will therefore be no increases in flow rates or</p>		

River Derwent and Bassenthwaite Lake SAC – construction phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>discharge volumes to Pow Beck. The conveyor route is enclosed, which will minimise the chance of contamination of local watercourses. Water pollution controls at the conveyor site and RLF, including the use of attenuation lagoons will avoid/minimise pollutant release to Pow Beck and hence the marine environment.</p> <p>Dilution effects within Bellhouse Gill and Pow Beck will also reduce the environmental concentrations of any contaminants present (though this is considered unlikely once good practice measures are in place) to the point where they are not predicted to have any significant impact on the marine environment (Chapter 17 Marine Environment, paragraph 17.29.21 & .22, Environmental Statement, West Cumbria Mining, 2018).</p> <p>Furthermore, discharges during the construction phase will be temporary in nature, i.e. they will only occur for the duration of the construction period, which is expected to be about 2 years, and at times when rainfall cannot be used in the construction processes (for example concrete mixing, damping down of roads and stockpiles etc).</p> <p>The mitigation measures (together with rapid mixing and dispersal in the marine environment) will significantly reduce the likelihood of pollution occurring. No significant effects are likely on the marine environment (Chapter 17 Marine Environment, paragraph 17.29.22, Environmental Statement, West Cumbria Mining, 2018), indeed any such impact is regarded as negligible.</p> <p>Consequently it is not expected that the discharge of pollutants (including changes in pH, temperature, salinity, and dissolved oxygen) will impact directly or indirectly on otter, salmon or lamprey</p>		

River Derwent and Bassenthwaite Lake SAC – construction phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>species (the only qualifying features of the SAC that use the marine environment) using the River Derwent estuary, which is c. 13 km to the north of the development site.</p> <p>The hydrological assessment has concluded that, with respect to groundwater and surface water, no pathway is considered to exist between the proposed development and any other proposed development (Chapter 12 Hydrology & Hydrogeology, Section 12.8, Environmental Statement, West Cumbria Mining, 2018).</p> <p>As such an in-combination effect with other plans or projects is considered very unlikely, however, to ensure a comprehensive assessment, nearby licensable discharges to sea in the vicinity of the mouth of Pow Beck have nevertheless been investigated.</p> <p>The zone of influence (ZOI) of the proposed surface water runoff discharge to Saltom Bay has been calculated as approximately 162 m and is over 8 km (by sea) from the mouth of Pow Beck. Hence no in-combination effect is predicted between the two sources of surface water runoff associated with the proposed development.</p> <p>The closest licensed discharge to the mouth of Pow Beck is a United Utilities pumping station located at Nethertown, which has a permit to discharge to sea (permit no. 017470153) approximately 4 km south of the mouth of Pow Beck. However, under the conditions of the permit, the pumping station may only discharge to sea in emergency circumstances when the pumping station is inoperative as a result of e.g. electrical failure or rising main failure. No discharge occurs under normal circumstances. For this reason this discharge has been scoped out of the in-combination impact assessment.</p>		

River Derwent and Bassenthwaite Lake SAC – construction phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>The United Utilities WwTW located at Braystones, south of Nethertown, discharges to sea via a long sea outfall (permit no. 017470152). The discharge point of this outfall is located approximately 7 km south from the mouth of Pow Beck and hence any combined effect between it and any discharges made via Pow Beck is very unlikely. Furthermore, the existing sewage discharge is discharged via diffuser(s) at a distance of ~2 km from shore and has an initial dilution factor generally considered appropriate for secondary treated sewage effluent. The existing discharge is therefore considered to have sufficient initial and secondary mixing to ensure that it will not produce cumulative or in-combination impacts with other discharges.</p> <p>The Sellafield outfalls extend ~2.1 km from shore into the north-eastern Irish Sea and are located approximately 8.8 km from the mouth of Pow Beck and hence, again, it is considered highly unlikely that the two plumes will interact. Furthermore, the two discharges are not similar; the proposed discharges to Pow Beck are ambient temperature freshwater which, with good practice guidelines in place, will not be contaminated, while the Sellafield discharge is a cooling water discharge, i.e. warm seawater. There is therefore no realistic likelihood of in-combination effects between the two discharges.</p> <p>There are no other projects which CCC is aware of in the marine environment in the proximity of the proposed mine that need to be included in an in-combination assessment. The NuGen Moorside development is currently on hold, and timescales, the nature and scope of the project, and its potential impacts are unknown. Therefore, no cumulative impact assessment is provided for this</p>		

River Derwent and Bassenthwaite Lake SAC – construction phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			development. It is concluded that there will be no adverse effect on the integrity of the SAC (through impacts on the populations of the SAC qualifying species or through impacts on supporting habitats or species) through this pathway alone or in combination with other plans or projects.		
10	Subsidence effects under the terrestrial environment	Subsidence under the terrestrial environment as a result of sub-surface mining activities	No subsidence is predicted during the construction phase as no mining activity will have commenced. Please see paragraphs 6.166 et seq in Chapter 6, which provides an assessment of the effects of subsidence.	Yes	Yes
11	Subsidence effects under the marine environment	Subsidence under the marine environment as a result of sub-surface mining activities	No subsidence is predicted during the construction phase as no mining activity will have commenced. Please see paragraphs 6.166 et seq in Chapter 6, which provides an assessment of the effects of subsidence.	Yes	Yes

Operation Phase

Table 9: Impact mechanisms and pathways during the operation phase of the development – River Derwent and Bassenthwaite Lake SAC

River Derwent and Bassenthwaite Lake SAC – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
1	Direct loss of or damage to terrestrial habitat – MMS, RLF/UC	Potential loss of terrestrial supporting habitat for SAC qualifying features through land-take	The interest features of the River Derwent and Bassenthwaite Lake SAC are aquatic hence there is no impact pathway from loss of or damage to terrestrial habitat. Please see paragraphs 6.19 et seq in Chapter 6, which provide a detailed assessment.	Yes	Yes
2	Disturbance of marine or terrestrial qualifying species (visual/noise/vibration) – MMS/RLF/UC/UM	Possible effect on migratory populations through mining operations including drilling	<u>Visual / human disturbance</u> The interest features of the River Derwent and Bassenthwaite Lake SAC are aquatic hence this impact pathway is not relevant. Please see paragraphs 6.36 et seq in Chapter 6, which provides a detailed assessment. <u>Noise and Vibration</u> The proposed development will not impact directly on any part of the River Derwent and Bassenthwaite Lake SAC, the nearest part of which is 10.03 km to the north-east. The noise and vibration assessment has concluded that there are no predicted noise or vibration related impacts arising from the terrestrial elements of the proposed development that will impact on the Solway Firth pSPA (which is 1.16 km to the north west of the development	Yes	Yes

River Derwent and Bassenthwaite Lake SAC – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>site) (Chapter 14 Noise and Vibration, section 14.9.4 et seq, Environmental Statement, West Cumbria Mining, 2018). It therefore follows that disturbance impacts are not expected to extend as far as more distant European sites, including the River Derwent and Bassenthwaite Lake SAC. The noise assessment concludes that construction noise levels at the proposed SPA will be less than 20 dB(A) at the nearest point, which is low compared with prevailing background noise levels; for example, background noise levels in a rural area at night are typically of the order 30 Db(A) (Chapter 14 Noise and Vibration, Table A14.1.1, Environmental Statement, West Cumbria Mining, 2018). It is therefore reasonable to conclude that noise levels at the SAC will be even lower.</p> <p>The noise and vibration assessment has used ecological receptors, such as St Bees Head SSSI which is c.285m to the north-west of the proposed development site, that are closer to the land at the development site than the River Derwent and Bassenthwaite Lake SAC (which is 10.03 km to the north-west at its closest point). Consequently it is reasonable to assume that the conclusions of the assessment for St Bees Head SSSI can be applied to the SAC and its supporting habitats and species. This conclusion is also reached within the marine assessment (Chapter 17 Marine Environment, Environmental Statement, section 17.32.9 et seq, West Cumbria Mining, 2018).</p> <p>No operational phase noise and vibration related impacts are expected on marine receptors as the mining will be undertaken 400m under the sea bed (Chapter 17 Marine Environment, Environmental Statement, section 17.32.9 et seq, West Cumbria Mining, 2018). The source sound and vibration will propagate away from source (the</p>		

River Derwent and Bassenthwaite Lake SAC – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>underground mining area) in all directions and begin to attenuate, i.e. it will reduce as it travels away from source. This will occur by two principle methods; geometric spreading and material damping. As sound energy travels away from source, attenuation will occur through reflection and refraction as the sound wave passes through layers of differing density. A significant amount of the source sound and vibration will therefore attenuate as it travels through the >400 m of rock above the mine. Attenuation will also occur between the various layers within the rock as well as between the rock/sediment and sediment/water boundaries.</p> <p>No disturbance of SAC qualifying species by noise and vibration is expected. The nearest part of the SAC is 10.03 km to the north-east (the River Derwent discharges to sea 13 km to the north of the site), which is well beyond the limits of any predicted noise and vibration effects. Furthermore the qualifying features utilise freshwater and marine habitats, which further buffers them from the effects of noise and vibration. The separation distance between the land at the development site and the River Derwent estuary (13 km) is sufficiently large that disturbance related impacts are not expected, both for SAC qualifying features associated with inland (freshwater) habitats and those that use the marine environment (and the supporting habitats and species on which they depend) (Chapter 17 Marine Environment, Environmental Statement, section 17.32.9 et seq, West Cumbria Mining, 2018).</p> <p>As such, an in-combination effect with other plans or projects is considered very unlikely. However, to ensure a comprehensive assessment, the following potential sources of marine noise have been considered which could, in combination with WCM's project,</p>		

River Derwent and Bassenthwaite Lake SAC – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>have an in combination effect on the marine qualifying features of the River Derwent and Bassenthwaite Lake SAC via the noise / vibration impact pathway. A search has been carried out for Marine Management Organisation (MMO) active licences and current licence applications to identify any marine projects which could, in combination with WCM's project, have an in combination effect on any European site via the noise / vibration impact pathway. This has shown that there is no such project located within the MMO's northwest Marine Planning Area (inshore and offshore) that has the potential to have an in-combination effect with WCM's proposed development.</p> <p>The in-combination assessment has also considered the following existing potential sources of marine noise which may have the potential to interact with the noise / vibration impacts on marine species associated with the proposed development:</p> <p><u>Shipping</u>: There are no major shipping lanes in the area around the proposed development and local vessel traffic densities are considered to be low. There is significant vessel traffic associated with the ports in the vicinity of Morecambe Bay (~50 km to the south), however this mostly consists of relatively small supply ships and the nearest major port is Liverpool, >100 km to the south of the proposed development.</p> <p><u>Windfarms</u>: The closest operational windfarms located in the sea are Robin Rigg (~25 km to the north) and Walney (~38 km to the south).</p> <p><u>Military areas</u>: There are multiple military practice areas in the north-eastern Irish Sea, the closest of which include a firing practice area to</p>		

River Derwent and Bassenthwaite Lake SAC – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>the northwest of the proposed offshore mining area (~9 km at closest point), and the Eskmeals Range, located near Ravenglass, which is charted as extending to 1 km south of South Head. No restrictions are placed on the right to transit these areas at any time, and the practice areas are operated using a clear range procedure, i.e. exercises and firing only take place when the areas are considered to be clear of all shipping. It can therefore be assumed that these areas are used only infrequently.</p> <p>All of these listed activities currently contribute to baseline noise conditions in the area of sea above the proposed offshore mining area; however, these are all intermittent sources of noise that are expected to have a temporary effect on the marine environment. Furthermore, WCM is not aware of any proposals to: increase shipping movements in the area; extend or increase activity associated with the nearest offshore windfarm sites or; increase use of nearby firing ranges and military practice areas.</p> <p>It is therefore concluded that sound and vibration arising from the proposed development will not have an effect on any European site in combination with other plans and projects.</p> <p>It is concluded that there will be no adverse effect on the integrity of the SAC (through impacts on the populations of the SAC qualifying species or through impacts on supporting habitats or species) through this pathway alone or in combination with other plans or projects.</p>		
3	Direct loss of or damage to marine habitat	Potential effect on migratory populations through:	The proposed development will not impact directly on any part of the River Derwent and Bassenthwaite Lake SAC. Impacts on marine habitat or disturbance to marine species from scouring and/or	Yes	Yes

River Derwent and Bassenthwaite Lake SAC – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
	or disturbance to marine species from scouring and/or sedimentation from any discharges from surface water drainage via Saltom Bay	Deterioration of food resource; Reduction in prey availability	<p>sedimentation are possible as a result of discharges of surface water made through the existing sea outfall pipe.</p> <p>The River Derwent discharges to the sea at Workington c.13 km to the north of the site. This is sufficiently distant that disturbance related impacts on animal movement or fish migration linked to the SAC are not expected (Chapter 17 Marine Environment, Environmental Statement, paragraph 17.29.19, West Cumbria Mining, 2018) and in any event the surface water will be settled prior to discharge</p> <p>All surface water from areas of hard-standing and roofs will be captured during the operation phase and directed (via oil interceptors and silt traps) to the underground storage tank for testing prior to discharge to sea using the existing outfall. In order to minimise potential scour, the maximum flow rate of the discharge will be limited to 25 l/s. In periods of heavy rainfall, flows will be attenuated on site through storage (Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, Flood Risk Assessment and Drainage Strategy, section 6.1.4.3 et seq, Environmental Statement, West Cumbria Mining, 2018; Chapter 17 Marine Environment, Environmental Statement, section 17.31, West Cumbria Mining, 2018).</p> <p>However, following heavy rainfall excess surface water runoff will need to be discharged to sea via the existing outfall in Saltom Bay. The discharge pipe runs down the foreshore and terminates in the intertidal zone (it is only fully exposed around low water springs tides). In order to minimise potential scour, the maximum flow rate of the discharge will be limited to 25 l/s, which will only be reached during and following heavy rainfall events. During the operational</p>		

River Derwent and Bassenthwaite Lake SAC – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>phase it is expected that there will be significant consumption of attenuated surface water for mining related activities, such as washing coal and preparation of the paste for backfill. It is therefore expected that the discharge of surface water will be significantly lower than the consented discharge rate (Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, Flood Risk Assessment and Drainage Strategy, section 6.1.4.3, Environmental Statement, West Cumbria Mining, 2018).</p> <p>The proposed development will minimise the potential for scour on the intertidal area around the outfall by limiting, wherever practicable, surface water discharge to when the outlet point is submerged. By only discharging surface water when the outlet point is submerged, the potential for scour at the proposed flow rates will be minimised (Chapter 17 Marine Environment, Environmental Statement, section 17.31.5, West Cumbria Mining, 2018).</p> <p>When the discharge point is exposed (i.e. not submerged), modelling results indicate that the proposed flow rate would be sufficient to mobilise fine sand material (i.e. no significant sediment re-suspension is likely (Chapter 17 Marine Environment, Environmental Statement, section 17.31.1, West Cumbria Mining, 2018). However, the sediments at the discharge point location consist of coarse sands (and cobbles and boulders), and so any re-suspended particles are likely to settle out very quickly. It is therefore concluded that any effect on water quality and biota will be localised and of minor significance (Chapter 17 Marine Environment, Environmental Statement, section 17.31.3, West Cumbria Mining, 2018).</p> <p>Modelling work has concluded that the Zone of Influence of the</p>		

River Derwent and Bassenthwaite Lake SAC – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>discharge into the sea, when combined with the existing leachate discharge, is 162m from the outfall, which means that the River Derwent and Bassenthwaite Lake SAC (which discharges to the sea at Workington c.13 km to the north of the site) and its qualifying features will not be directly impacted (Chapter 17 Marine Environment, Environmental Statement, section 17.34.7 et seq, West Cumbria Mining, 2018)</p> <p>Consequently, as the proposed discharge is not expected to have a significant effect on marine fauna, no significant effect is expected in respect of salmon, otter or lamprey species (the only qualifying features of the SAC that use the marine environment) using the River Derwent estuary, which is c. 13 km to the north of the development site, or migrating at sea. Similarly, there will be no significant indirect impacts on SAC qualifying features as a result of impacts on prey species.</p> <p>As such, an in-combination effect with other plans or projects is considered very unlikely, however, to ensure a comprehensive assessment, other discharges from other plans and projects have also been considered (if they include a proposed discharge to sea which could combine with the 162m zone of influence from the Saltom Bay outfall) (Chapter 17 Marine Environment, Environmental Statement, sections 17.34.1 to 17.34.5, West Cumbria Mining, 2018).</p> <p>The zone of influence (ZOI) of the proposed surface water runoff discharge to Saltom Bay has been calculated as approximately 162 m and is over 8 km (by sea) from the mouth of Pow Beck. Hence no in-combination effect is predicted between the two sources of surface water runoff associated with the proposed development.</p>		

River Derwent and Bassenthwaite Lake SAC – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>The following licensable discharges to sea are within the vicinity of Saltom Bay and have the potential to interact with the surface water runoff discharges from the Saltom Bay outfall associated with the proposed development (Chapter 17 , paragraph 17.34, of the Environmental Statement):</p> <p>A private sewer discharge outfall is located approximately 350 m from the proposed WCM discharge point and it is permitted to discharge no more than 0.2 m³ per day. The permit associated with this discharge states that the discharge must have no adverse visible effect on the receiving environment. Modelling shows that the private sewer discharge from a pharmacy in Kells (to Saltom Bay) is outside the zone of influence for the WCM discharge (Chapter 17 Marine Environment, paragraph 17.34.7, Environmental Statement, 2018). This is the case even when the outfall is fully exposed at low tide. Due to the separation distance and the very small volume of this discharge, a significant in-combination effect is not predicted to occur (Chapter 17 Marine Environment, paragraph 17.34.8, Environmental Statement, 2018).</p> <p>A United Utilities pumping station discharge (to Saltom Bay) is also outside the zone of influence for the WCM discharge (Chapter 17 Marine Environment, paragraph 17.34.7, Environmental Statement, 2018). The pumping station may only discharge to sea in emergency circumstances when the pumping station is inoperative. No discharge occurs under normal circumstances. Due to the operational restrictions on this outfall, a significant in-combination effect is not predicted (Chapter 17 Marine Environment, paragraph 17.34.9, Environmental Statement, 2018).</p>		

River Derwent and Bassenthwaite Lake SAC – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>The Sellafield outfalls extend ~2.1 km from shore into the north-eastern Irish Sea and are located approximately 14.5 km directly south of the Saltom Bay discharge point (~17 km by sea). The Sellafield discharge outfall (at Seascale) is therefore also outside the zone of influence for the WCM discharge (Chapter 17 Marine Environment, paragraph 17.34.7, Environmental Statement, 2018). An in-combination effect is not predicted to occur due to the separation distance (Chapter 17 Marine Environment, paragraph 17.34.11, Environmental Statement, 2018).</p> <p>The United Utilities wastewater treatment works discharge (at Parton, north of Whitehaven) is located approximately 5 km from the proposed discharge point in Saltom Bay. The discharge point of this outfall is therefore also outside the zone of influence for the WCM discharge (Chapter 17 Marine Environment, paragraph 17.34.7, Environmental Statement, 2018). Furthermore, the existing sewage discharge is discharged via diffuser(s) at a distance of ~1.9 km from shore, in the main current flows of the Solway Firth, and has an initial dilution factor of 50, which is generally considered appropriate for secondary treated sewage effluent. The United Utilities wastewater treatment works discharge is therefore considered to have sufficient initial and secondary mixing to ensure that it will not produce cumulative or in-combination impacts with the Saltom Bay discharge. (Chapter 17 Marine Environment, paragraph 17.34.10, Environmental Statement, 2018).</p> <p>There are no other projects which CCC is aware of in the marine environment in the proximity of the proposed mine that need to be included in an in-combination assessment. The NuGen Moorside</p>		

River Derwent and Bassenthwaite Lake SAC – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>development is currently on hold, and timescales, the nature and scope of the project, and its potential impacts are unknown. Therefore, no cumulative impact assessment is provided for this development.</p> <p>It is therefore concluded that the discharge will not have a significant effect on the marine environment, either alone or in combination with other discharges from other plans or projects (Chapter 17 Marine Environment, Environmental Statement, section 17.31.5, West Cumbria Mining, 2018).</p> <p>It is also concluded that there will be no adverse effect on the integrity of the SAC (through impacts on the populations of the SAC qualifying species or through impacts on supporting habitats or species) through this pathway alone or in combination with other plans or projects.</p>		
4	Direct loss of or damage to marine habitat or disturbance to marine species from scouring and/or sedimentation from any discharges via Pow Beck	<p>Potential effect on migratory populations through:</p> <p>Deterioration of food resource;</p> <p>Reduction in prey availability</p>	<p>The proposed development will not impact directly on any part of the River Derwent and Bassenthwaite Lake SAC, however impacts on marine habitat or disturbance to marine species from scouring and/or sedimentation are, however, possible at the point where Pow Beck discharges to the sea to the south of St Bees (approximately 2.8 km downstream of the development), as a result of the discharge of surface water made to connected watercourses from the conveyor and RLF.</p> <p>Whilst the River Derwent and Bassenthwaite Lake SAC is 10.03 km to the north-east of the site, the point at which the River Derwent discharges to the sea is more than 18 km to the north of the Pow Beck. This is sufficiently distant that scour / sedimentation related impacts on fish migration linked to the SAC are not expected</p>	Yes	Yes

River Derwent and Bassenthwaite Lake SAC – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>(Chapter 17 Marine Environment, Environmental Statement, paragraph 17.29.19, West Cumbria Mining, 2018).</p> <p>Surface water flows, if uncontrolled, have the potential to entrain sediments and contaminants generated by the operation of the proposed development, which may have negative impacts on marine water quality and marine biota. In addition, the flows themselves, if increased, will have the potential to cause scouring around the mouth of Pow Beck.</p> <p>In order to minimise potential scour, discharge and control measures will be adopted at the conveyor and rail loading facility sites (Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, sections 6.2 and 6.3, Flood Risk Assessment and Drainage Strategy, Environmental Statement, West Cumbria Mining, 2018; Sections 5.7 and 5.10 of the Draft Environmental Management Plan - Appendix E to Chapter 5 Project Description, Environmental Statement, West Cumbria Mining, 2018).</p> <p>Bellhouse Gill and an unnamed tributary of the Pow Beck (both ephemeral watercourses) are intersected by the conveyor route. The conveyor will be buried beneath these two ephemeral watercourses; during the construction phase, the watercourses will be diverted around the construction area. There will therefore be no increases in flow rates or discharge volumes to Pow Beck, and hence no impacts at St Bees beach due to scour are predicted (Chapter 17 Marine Environment, Environmental Statement, section 17.32.7, West Cumbria Mining, 2018). . After construction the conveyor box will be backfilled with low permeability material in a way that will minimise ingress and tracking of surface water along the outside of the box</p>		

River Derwent and Bassenthwaite Lake SAC – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>structure. At this point the difference between the flow regimes pre and post construction is expected to be negligible (Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, Flood Risk Assessment and Drainage Strategy, section 6.2.1.2, Environmental Statement, West Cumbria Mining, 2018). This situation is expected to continue during the operational phase as the conveyor will be left in situ.</p> <p>During the operational phase, surface water runoff at the rail loading facility (RLF) site will be retained on-site in attenuation lagoons. Surface discharges to Pow Beck will be at a reduced rate compared to the current greenfield runoff rates. Whilst runoff volume will increase due to the increase in impermeable area, this excess volume will be discharged slowly after the peak flow has passed and will not increase flood flow rates in the Pow Beck.</p> <p>Consequently, impacts associated with scour at the mouth of the Pow Beck are therefore not predicted to occur (Chapter 17 Marine Environment, Environmental Statement, sections 17.32.7, West Cumbria Mining, 2018).</p> <p>It is concluded that there will be no adverse effect on the integrity of the SAC (through impacts on the populations of the SAC qualifying species or through impacts on supporting habitats or species) through this pathway alone or in combination with other plans or projects.</p> <p>In relation to the risk of scouring there is predicted to be no impact at the point where the Pow Beck discharges to the sea from WCM's project and so no risk of any in combination impact.</p>		
5	Dust and other	Potential effect on	Please see paragraphs 6.144 et seq in Chapter 6, which provide a	Yes	Yes

River Derwent and Bassenthwaite Lake SAC – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
	airborne contamination of marine and terrestrial habitats – MMS/RLF	migratory populations through: Deterioration of food resource; Reduction in prey availability	<p>detailed assessment of the effects of dust.</p> <p>Please see paragraphs 6.148 et seq in Chapter 6, which provide a detailed assessment of the effects of NOx.</p> <p>Please see paragraphs 6.152 et seq in Chapter 6, which provide a detailed assessment of the effects of N deposition.</p> <p>It is important to note that the analysis of air quality impacts presented in the above sections represents, as is legally required, a cumulative assessment of the proposed development (i.e. in combination with other plans and projects). This covers dust, traffic, and other operational controlled emissions and is explained in detail in the air quality assessment (Chapter 15 Air Quality, section 15.7, paragraph 15.7.1 - 15.7.4 [dust], paragraph 15.7.5 – 15.7.10 [traffic], paragraph 15.7.11 – 15.7.12 [controlled emissions], Environmental Statement, 2018)).</p>		
6	Deterioration of marine water quality as a result of sediment-laden surface water run-off via Saltom Bay outfall	Potential effect on qualifying features including impacts on prey availability and deterioration of food resource through: Escape of sediment-entrained surface water	<p>The proposed development will not impact directly on any part of the River Derwent and Bassenthwaite Lake SAC. Impacts on marine water quality are possible as a result of discharges of surface water made through the existing sea outfall pipe.</p> <p>The River Derwent discharges to the sea at Workington c.13 km to the north of the site. This is sufficiently distant that water quality related impacts on animal movement or fish migration are not expected (Chapter 17 Marine Environment, Environmental Statement, paragraph 17.29.19, West Cumbria Mining, 2018) and in any event the surface water will be settled prior to discharge,</p>	Yes	Yes

River Derwent and Bassenthwaite Lake SAC – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>In the absence of mitigation measures, the release of sediment-laden surface water into the marine environment could potentially impact on SAC qualifying features directly (if they are present in the vicinity of the discharge pipe), for example as a result of habitat deterioration due to sediment laden water, or indirectly, by impacting on the prey species or habitats that SAC qualifying features depend upon.</p> <p>However, the effects of suspended solids on the marine environment will be fully mitigated during the operational phase. During the operation phase of the development surface water within the site will be collected and stored. The mining activities are water consumptive and so it is expected that most surface water will be utilised on site (Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, Flood Risk Assessment and Drainage Strategy, Section 6.1.4.3, Environmental Statement, West Cumbria Mining, 2018).</p> <p>All surface water arising from areas of hard-standing and roofs of buildings will be captured, attenuated on site and used in the coal processing plant and as a source of grey water (for example for toilet flushing etc) (Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, Flood Risk Assessment and Drainage Strategy, Section 6.1.4.3, Environmental Statement, West Cumbria Mining, 2018; Sections 5.7 and 5.10 of the Draft Environmental Management Plan - Appendix E to Chapter 5 Project Description, Environmental Statement, West Cumbria Mining, 2018).</p> <p>Storm water flows will be accommodated in the storm water attenuation tank on site (total capacity 6,500 m³) (Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, Flood Risk Assessment and Drainage Strategy, Section 6.1.3.3, Environmental Statement,</p>		

River Derwent and Bassenthwaite Lake SAC – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>West Cumbria Mining, 2018). Where possible, these flows will be used in the coal processing and associated plant, however in exceptional circumstances a storm water discharge may be required. Storm water flows will go to sea via the existing discharge point, and they will first be passed through silt traps and oil interceptors (although it should be noted that during the operational phase silt mobilisation will be limited once the bund vegetation is established, and no oils will be stored outside). All pollutants (including sediments) will be controlled through the adoption of best practice measures (Draft Environmental Management Plan - Appendix E to Chapter 5 Project Description, Sections 5.7 and 5.10, Environmental Statement, West Cumbria Mining, 2018).</p> <p>The discharge will be at a maximum flow rate of 25 l/s (Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, Flood Risk Assessment and Drainage Strategy, section 6.1.4.2 et seq, Environmental Statement, West Cumbria Mining, 2018). The attenuation measures described above will ensure that the maximum permitted flow rate of 25 l/s is not exceeded.</p> <p>Discharged surface water will necessarily have to achieve the environmental permit standard that will be set by the consenting authority (Chapter 5, Environmental Statement, Appendix E, Section 6, West Cumbria Mining, 2018; Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, Flood Risk Assessment and Drainage Strategy, section 6.1.3.3, Environmental Statement, West Cumbria Mining, 2018). A Marine Environmental Monitoring Plan will be implemented to assess the potential impacts of the discharge (Chapter 17 Marine Environment, Appendix C, paragraph 4.12, Environmental Statement, West Cumbria Mining, 2018).</p> <p>Modelling work has concluded that the Zone of Influence of the</p>		

River Derwent and Bassenthwaite Lake SAC – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>discharge into the sea, when combined with the existing leachate discharge, is 162m from the outfall, which means that the River Derwent and Bassenthwaite Lake SAC (which discharges to the sea at Workington c.13 km to the north of the site) and its qualifying features will not be directly impacted (Chapter 17 Marine Environment, Environmental Statement, section 17.34.7 et seq, West Cumbria Mining, 2018). As the proposed discharge is not expected to have a significant effect on marine fauna, no indirect impacts on SAC qualifying features are expected either, e.g. as a result of impacts on prey species.</p> <p>The proposed mitigation measures and the maximum discharge rate (together with rapid mixing and dispersal in the marine environment) will ensure that the effects of the discharge are limited in their extent. No significant effects are likely on the marine environment (Chapter 17 Marine Environment, paragraph 17.31.6, Environmental Statement, West Cumbria Mining, 2018), indeed any such impact is regarded as negligible. Consequently it is not expected that the discharge of sediment laden surface water will impact directly or indirectly on salmon, otter, or lamprey species (the only qualifying features of the SAC that use the marine environment) using the River Derwent estuary, which is c. 13 km to the north of the development site.</p> <p>The hydrological assessment has concluded that, with respect to groundwater and surface water, no pathway is considered to exist between the proposed development and any other proposed development (Chapter 12 Hydrology & Hydrogeology, Section 12.8, Environmental Statement, West Cumbria Mining, 2018). As such, an in-combination effect with other plans or projects is considered very</p>		

River Derwent and Bassenthwaite Lake SAC – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>unlikely, however, to ensure a comprehensive assessment, other discharges from other plans and projects have also been considered (if they include a proposed discharge to sea which could combine with the 162m zone of influence from the Saltom Bay outfall) (Chapter 17 Marine Environment, Environmental Statement, section 17.34.5 et seq, West Cumbria Mining, 2018).</p> <p>The zone of influence (ZOI) of the proposed surface water runoff discharge to Saltom Bay has been calculated as approximately 162 m and is over 8 km (by sea) from the mouth of Pow Beck. Hence no in-combination effect is predicted between the two sources of surface water runoff associated with the proposed development. The following licensable discharges to sea are within the vicinity of Saltom Bay and have the potential to interact with the surface water runoff discharges from the Saltom Bay outfall associated with the proposed development (Chapter 17 , paragraph 17.34, of the Environmental Statement):</p> <p>A private sewer discharge outfall is located approximately 350 m from the proposed WCM discharge point and it is permitted to discharge no more than 0.2 m³ per day. The permit associated with this discharge states that the discharge must have no adverse visible effect on the receiving environment. Modelling shows that the private sewer discharge from a pharmacy in Kells (to Saltom Bay) is outside the zone of influence for the WCM discharge (Chapter 17 Marine Environment, paragraph 17.34.7, Environmental Statement, 2018). This is the case even when the outfall is fully exposed at low tide. Due to the separation distance and the very small volume of this discharge, a significant in-combination effect is not predicted to occur (Chapter 17 Marine Environment, paragraph 17.34.8, Environmental</p>		

River Derwent and Bassenthwaite Lake SAC – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>Statement, 2018).</p> <p>A United Utilities pumping station discharge (to Saltom Bay) is also outside the zone of influence for the WCM discharge (Chapter 17 Marine Environment, paragraph 17.34.7, Environmental Statement, 2018). The pumping station may only discharge to sea in emergency circumstances when the pumping station is inoperative. No discharge occurs under normal circumstances. Due to the operational restrictions on this outfall, a significant in-combination effect is not predicted (Chapter 17 Marine Environment, paragraph 17.34.9, Environmental Statement, 2018).</p> <p>The Sellafield outfalls extend ~2.1 km from shore into the north-eastern Irish Sea and are located approximately 14.5 km directly south of the Saltom Bay discharge point (~17 km by sea). The Sellafield discharge outfall (at Seascale) is therefore also outside the zone of influence for the WCM discharge (Chapter 17 Marine Environment, paragraph 17.34.7, Environmental Statement, 2018). An in-combination effect is not predicted to occur due to the separation distance (Chapter 17 Marine Environment, paragraph 17.34.11, Environmental Statement, 2018).</p> <p>The United Utilities wastewater treatment works discharge (at Parton, north of Whitehaven) is located approximately 5 km from the proposed discharge point in Saltom Bay. The discharge point of this outfall is therefore also outside the zone of influence for the WCM discharge (Chapter 17 Marine Environment, paragraph 17.34.7, Environmental Statement, 2018). Furthermore, the existing sewage discharge is discharged via diffuser(s) at a distance of ~1.9 km from shore, in the main current flows of the Solway Firth, and has an initial</p>		

River Derwent and Bassenthwaite Lake SAC – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>dilution factor of 50, which is generally considered appropriate for secondary treated sewage effluent. The United Utilities wastewater treatment works discharge is therefore considered to have sufficient initial and secondary mixing to ensure that it will not produce cumulative or in-combination impacts with the Saltom Bay discharge. (Chapter 17 Marine Environment, paragraph 17.34.10, Environmental Statement, 2018).</p> <p>There are no other projects which CCC is aware of in the marine environment in the proximity of the proposed mine that need to be included in an in-combination assessment. The NuGen Moorside development is currently on hold, and timescales, the nature and scope of the project, and its potential impacts are unknown. Therefore, no cumulative impact assessment is provided for this development.</p> <p>It is concluded that there will be no adverse effect on the integrity of the SAC (through impacts on the populations of the SAC qualifying species or through impacts on supporting habitats or species) through this pathway alone or in combination with other plans or projects.</p>		
7	Deterioration of marine water quality as a result of disturbance of contaminated land and mobilisation of pollutants	<p>Qualifying features including impacts on prey availability and deterioration of food resource through:</p> <p>Mobilisation of underground contaminants</p>	<p>The proposed development will not impact directly on any part of the River Derwent and Bassenthwaite Lake SAC. Impacts on marine water quality are possible as a result of discharges of surface water made through the existing sea outfall pipe.</p> <p>The River Derwent discharges to the sea at Workington c.13 km to the north of the site. This is sufficiently distant that water quality related impacts on animal movement or fish migration linked to the SAC (salmon, otter, and lamprey species are qualifying features of</p>	Yes	Yes

River Derwent and Bassenthwaite Lake SAC – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
	(including changes in pH, temperature, salinity, and dissolved oxygen) discharged via Saltom Bay outfall	<p>disturbed</p> <p>Potential for pollution incidents from spillages, leakages etc from stored chemicals, fuel and oils on site.</p>	<p>the SAC) are not expected and in any event the surface water discharge will be treated prior to discharge.</p> <p>In the absence of mitigation measures, the release of pollutants into the marine environment could potentially impact on SAC qualifying features directly (if they are present in the vicinity of the discharge pipe), for example as a result of toxic effects, or indirectly, by impacting on the prey species that SAC qualifying features depend upon.</p> <p>There are also potential impacts associated with the discharge and these are related to non-toxic inputs. These include the effects of pH, temperature, salinity and dissolved oxygen.</p> <p>However, the effects of pollutants on the marine environment will be fully mitigated during the operational phase. During the operational phase of the development surface water within the site will be collected and stored. The mining activities are water consumptive and so it is expected that most surface water will be utilised on site (Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, Flood Risk Assessment and Drainage Strategy, Section 6.1.4.3, Environmental Statement, West Cumbria Mining, 2018).</p> <p>All surface water arising from areas of hard-standing and roofs of buildings will be captured, attenuated on site and used in the coal processing plant and as a source of grey water (for example for toilet flushing etc) (Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, Flood Risk Assessment and Drainage Strategy, Section 6.1.4.3, Environmental Statement, West Cumbria Mining, 2018; Sections 5.7 and 5.10 of the Draft Environmental Management Plan - Appendix E</p>		

River Derwent and Bassenthwaite Lake SAC – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>to Chapter 5 Project Description, Environmental Statement, West Cumbria Mining, 2018).</p> <p>Storm water flows will be accommodated in the storm water attenuation tank on site (total capacity 6,500m³) (Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, Flood Risk Assessment and Drainage Strategy, Section 6.1.4.3, Environmental Statement, West Cumbria Mining, 2018). Where possible, these flows will be used in the coal processing and associated plant, however in exceptional circumstances a storm water discharge may be required. Storm water flows will go to sea via the existing discharge point, and they will first be passed through silt traps and oil interceptors (although it should be noted that during the operational phase silt mobilisation will be limited once the bund vegetation is established, and no oils will be stored outside).</p> <p>The discharge will be at a maximum flow rate of 25 l/s (Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, Flood Risk Assessment and Drainage Strategy, section 6.1.4.2 et seq, Environmental Statement, West Cumbria Mining, 2018). The attenuation measures described above will ensure that the maximum permitted flow rate of 25 l/s is not exceeded.</p> <p>Discharged surface water will necessarily have to achieve the environmental permit standard that will be set by the consenting authority (Chapter 5, Environmental Statement, Appendix E, Section 6, West Cumbria Mining, 2018; Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, Flood Risk Assessment and Drainage Strategy, section 6.1.3.3, Environmental Statement, West Cumbria Mining, 2018). All other pollutants will be controlled through the</p>		

River Derwent and Bassenthwaite Lake SAC – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>adoption of best practice measures (Draft Environmental Management Plan - Appendix E to Chapter 5 Project Description, Sections 5.7 and 5.10, Environmental Statement, West Cumbria Mining, 2018). A Marine Environmental Monitoring Plan will be implemented to assess the potential impacts of the discharge (Chapter 17 Marine Environment, Appendix C, paragraph 4.12, Environmental Statement, West Cumbria Mining, 2018).</p> <p>The marine assessment has concluded that the proposed discharge of surface water into the marine environment is not expected to have an effect on pH, salinity, water temperature of dissolved oxygen (Chapter 17 Marine Environment, Environmental Statement, West Cumbria Mining, 2018, paragraphs 17.31.7 [pH], 17.31.9-12 [salinity], 17.31.8 [water temperature], 17.31.13-14 [dissolved oxygen]).</p> <p>Modelling work has concluded that the Zone of Influence of the discharge into the sea, when combined with the existing leachate discharge, is 162m from the outfall, which means that the River Derwent and Bassenthwaite Lake SAC (which discharges to the sea at Workington c.13 km to the north of the site) and its qualifying features will not be directly impacted (Chapter 17 Marine Environment, Environmental Statement, section 17.34.7 et seq, West Cumbria Mining, 2018). As the proposed discharge is not expected to have a significant effect on marine fauna, no indirect impacts on SAC qualifying features are expected either, e.g. as a result of impacts on prey species.</p> <p>The proposed mitigation measures and the maximum discharge rate (together with rapid mixing and dispersal in the marine environment) will ensure that the effects of the discharge are limited in their extent.</p>		

River Derwent and Bassenthwaite Lake SAC – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>No significant effects are likely on the marine environment (Chapter 17 Marine Environment, paragraph 17.31.6 et seq, Environmental Statement, West Cumbria Mining, 2018), indeed any such impact is regarded as negligible.</p> <p>Consequently it is not expected that the discharge of pollutants (including changes in pH, temperature, salinity, and dissolved oxygen) will impact directly or indirectly on otter, salmon or lamprey species (the only qualifying features of the SAC that use the marine environment) using the River Derwent estuary, which is c. 13 km to the north of the development site.</p> <p>The hydrological assessment has concluded that, with respect to groundwater and surface water, no pathway is considered to exist between the proposed development and any other proposed development (Chapter 12 Hydrology & Hydrogeology, Section 12.8, Environmental Statement, West Cumbria Mining, 2018).</p> <p>As such, an in-combination effect with other plans or projects is considered very unlikely, however, to ensure a comprehensive assessment, other discharges from other plans and projects have also been considered (if they include a proposed discharge to sea which could combine with the 162m zone of influence from the Saltom Bay outfall) (Chapter 17 Marine Environment, Environmental Statement, section 17.34.1 et seq, West Cumbria Mining, 2018).</p> <p>The zone of influence (ZOI) of the proposed surface water runoff discharge to Saltom Bay has been calculated as approximately 162 m and is over 8 km (by sea) from the mouth of Pow Beck. Hence no in-combination effect is predicted between the two sources of surface</p>		

River Derwent and Bassenthwaite Lake SAC – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>water runoff associated with the proposed development.</p> <p>The following licensable discharges to sea are within the vicinity of Saltom Bay and have the potential to interact with the surface water runoff discharges from the Saltom Bay outfall associated with the proposed development (Chapter 17 , paragraph 17.34, of the Environmental Statement):</p> <p>A private sewer discharge outfall is located approximately 350 m from the proposed WCM discharge point and it is permitted to discharge no more than 0.2 m³ per day. The permit associated with this discharge states that the discharge must have no adverse visible effect on the receiving environment. Modelling shows that the private sewer discharge from a pharmacy in Kells (to Saltom Bay) is outside the zone of influence for the WCM discharge (Chapter 17 Marine Environment, paragraph 17.34.7, Environmental Statement, 2018). This is the case even when the outfall is fully exposed at low tide. Due to the separation distance and the very small volume of this discharge, a significant in-combination effect is not predicted to occur (Chapter 17 Marine Environment, paragraph 17.34.8, Environmental Statement, 2018).</p> <p>A United Utilities pumping station discharge (to Saltom Bay) is also outside the zone of influence for the WCM discharge (Chapter 17 Marine Environment, paragraph 17.34.7, Environmental Statement, 2018). The pumping station may only discharge to sea in emergency circumstances when the pumping station is inoperative. No discharge occurs under normal circumstances. Due to the operational restrictions on this outfall, a significant in-combination effect is not predicted (Chapter 17 Marine Environment, paragraph</p>		

River Derwent and Bassenthwaite Lake SAC – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>17.34.9, Environmental Statement, 2018).</p> <p>The Sellafield outfalls extend ~2.1 km from shore into the north-eastern Irish Sea and are located approximately 14.5 km directly south of the Saltom Bay discharge point (~17 km by sea). The Sellafield discharge outfall (at Seascale) is therefore also outside the zone of influence for the WCM discharge (Chapter 17 Marine Environment, paragraph 17.34.7, Environmental Statement, 2018). An in-combination effect is not predicted to occur due to the separation distance (Chapter 17 Marine Environment, paragraph 17.34.11, Environmental Statement, 2018).</p> <p>The United Utilities wastewater treatment works discharge (at Parton, north of Whitehaven) is located approximately 5 km from the proposed discharge point in Saltom Bay. The discharge point of this outfall is therefore also outside the zone of influence for the WCM discharge (Chapter 17 Marine Environment, paragraph 17.34.7, Environmental Statement, 2018). Furthermore, the existing sewage discharge is discharged via diffuser(s) at a distance of ~1.9 km from shore, in the main current flows of the Solway Firth, and has an initial dilution factor of 50, which is generally considered appropriate for secondary treated sewage effluent. The United Utilities wastewater treatment works discharge is therefore considered to have sufficient initial and secondary mixing to ensure that it will not produce cumulative or in-combination impacts with the Saltom Bay discharge. (Chapter 17 Marine Environment, paragraph 17.34.10, Environmental Statement, 2018).</p> <p>There are no other projects which CCC is aware of in the marine environment in the proximity of the proposed mine that need to be</p>		

River Derwent and Bassenthwaite Lake SAC – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>included in an in-combination assessment. The NuGen Moorside development is currently on hold, and timescales, the nature and scope of the project, and its potential impacts are unknown. Therefore, no cumulative impact assessment is provided for this development.</p> <p>It is concluded that there will be no adverse effect on the integrity of the SAC (through impacts on the populations of the SAC qualifying species or through impacts on supporting habitats or species) through this pathway alone or in combination with other plans or projects.</p>		

River Derwent and Bassenthwaite Lake SAC – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
8	Deterioration of marine water quality as a result of sediment-laden surface water run-off via Pow Beck catchment	Potential effect on qualifying features including impacts on prey availability and deterioration of food resource through surface water discharge and run-off	<p>The proposed development will not impact directly on any part of the River Derwent and Bassenthwaite Lake SAC; however, impacts on marine water quality are possible as a result of discharges of surface water made from the RLF and Conveyor to the Bellhouse Gill and Pow Beck, which eventually discharges to the sea to the south of St Bees approximately 2.8 km downstream of the development.</p> <p>Whilst the River Derwent and Bassenthwaite Lake SAC is 10.03 km to the north-east of the site, the point at which the River Derwent discharges to the sea is more than 18 km to the north of the Pow Beck. This is sufficiently distant that impacts on SAC qualifying features due to sediment-laden surface water are not expected (Chapter 17 Marine Environment, Environmental Statement, paragraph 17.29.19, West Cumbria Mining, 2018).</p> <p>In the absence of mitigation the release of sediment-laden surface water via the Pow Beck into the marine environment could potentially impact on SAC qualifying features directly (if they are present in the vicinity of the Pow Beck where it discharges to sea at St Bees Beach), for example as a result of habitat deterioration due to sediment-laden water, or indirectly, by impacting on the prey species that SAC qualifying features depend upon.</p> <p>The effects of suspended solids (transported via the Pow Beck) on the marine environment will be fully mitigated through measures that will be adopted during the operational phase of the development.</p> <p>Bellhouse Gill and an unnamed tributary of the Pow Beck (both ephemeral watercourses) are intersected by the conveyor route. The</p>	Yes	Yes

River Derwent and Bassenthwaite Lake SAC – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>conveyor will be buried beneath these ephemeral watercourses; following construction, the flow regime at these locations will return to pre-development conditions. Surface discharges to Pow Beck will be at a reduced rate compared to the current greenfield runoff rates. Whilst runoff volume will increase due to the increase in impermeable area, this excess volume will be discharged slowly after the peak flow has passed and will not increase flood flow rates in the Pow Beck.</p> <p>During the operation phase of the development surface water within the site will be collected and stored. The mining activities are water consumptive and so it is expected that most surface water will be utilised on site (Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, Flood Risk Assessment and Drainage Strategy, Section 6.1.4.3, Environmental Statement, West Cumbria Mining, 2018).</p> <p>All other pollution effects will be fully mitigated through the adoption of best practice pollution prevention measures at the conveyor site and RLF.. (Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, Flood Risk Assessment and Drainage Strategy, Sections 6.2 and 6.3, Environmental Statement, West Cumbria Mining, 2018 and Draft Environmental Management Plan - Appendix E to Chapter 5 Project Description, Sections 5.7 and 5.10, Environmental Statement, West Cumbria Mining, 2018).</p> <p>Dilution effects within Bellhouse Gill and Pow Beck will also reduce the environmental concentrations of any contaminants present (though this is considered unlikely once good practice measures are in place) to the point where they are not predicted to have any</p>		

River Derwent and Bassenthwaite Lake SAC – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>significant impact on the marine environment (Chapter 17 Marine Environment, paragraph 17.29.21 – 17.29.23, Environmental Statement, West Cumbria Mining, 2018).</p> <p>These good practice measures, in conjunction with mixing and dilution effects of the freshwater watercourses, mean that no significant impact from sediments on the marine environment is predicted via the Pow Beck pathway (see Chapter 17, Marine Environment, paragraph 17.29.22, Environmental Statement 2018), indeed any such impact is regarded as negligible.</p> <p>Consequently it is not expected that the discharge to Pow Beck will impact directly or indirectly on SAC populations of qualifying features or their supporting habitats or species.</p> <p>The hydrological assessment has concluded that, with respect to groundwater and surface water, no pathway is considered to exist between the proposed development and any other proposed development (Chapter 12 Hydrology & Hydrogeology, Section 12.8, Environmental Statement, West Cumbria Mining, 2018).</p> <p>As such an in-combination effect with other plans or projects is considered very unlikely, however, to ensure a comprehensive assessment, nearby licensable discharges to sea in the vicinity of the mouth of Pow Beck have nevertheless been investigated.</p> <p>The zone of influence (ZOI) of the proposed surface water runoff discharge to Saltom Bay has been calculated as approximately 162 m and is over 8 km (by sea) from the mouth of Pow Beck. Hence no in-combination effect is predicted between the two sources of surface</p>		

River Derwent and Bassenthwaite Lake SAC – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>water runoff associated with the proposed development.</p> <p>The closest licensed discharge to the mouth of Pow Beck is a United Utilities pumping station located at Nethertown, which has a permit to discharge to sea (permit no. 017470153) approximately 4 km south of the mouth of Pow Beck. However, under the conditions of the permit, the pumping station may only discharge to sea in emergency circumstances when the pumping station is inoperative as a result of e.g. electrical failure or rising main failure. No discharge occurs under normal circumstances. For this reason this discharge has been scoped out of the in-combination impact assessment.</p> <p>The United Utilities WwTW located at Braystones, south of Nethertown, discharges to sea via a long sea outfall (permit no. 017470152). The discharge point of this outfall is located approximately 7 km south from the mouth of Pow Beck and hence any combined effect between it and any discharges made via Pow Beck is very unlikely. Furthermore, the existing sewage discharge is discharged via diffuser(s) at a distance of ~2 km from shore and has an initial dilution factor generally considered appropriate for secondary treated sewage effluent. The existing discharge is therefore considered to have sufficient initial and secondary mixing to ensure that it will not produce cumulative or in-combination impacts with other discharges.</p> <p>The Sellafield outfalls extend ~2.1 km from shore into the north-eastern Irish Sea and are located approximately 8.8 km from the mouth of Pow Beck and hence, again, it is considered highly unlikely that the two plumes will interact. Furthermore, the two discharges are not similar; the proposed discharges to Pow Beck are ambient</p>		

River Derwent and Bassenthwaite Lake SAC – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>temperature freshwater which, with good practice guidelines in place, will not be contaminated, while the Sellafield discharge is a cooling water discharge, i.e. warm seawater. There is therefore no realistic likelihood of in-combination effects between the two discharges.</p> <p>There are no other projects which CCC is aware of in the marine environment in the proximity of the proposed mine that need to be included in an in-combination assessment. The NuGen Moorside development is currently on hold, and timescales, the nature and scope of the project, and its potential impacts are unknown. Therefore, no cumulative impact assessment is provided for this development.</p> <p>It is concluded that there will be no adverse effect on the integrity of the SAC (through impacts on the populations of the SAC qualifying species or through impacts on supporting habitats or species) through this pathway alone or in combination with other plans or projects.</p>		

River Derwent and Bassenthwaite Lake SAC – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
9	Deterioration of marine water quality as a result of disturbance of contaminated land and mobilisation of pollutants (including changes in pH, temperature, salinity, and dissolved oxygen) discharged via Pow Beck catchment	<p>Potential effect on qualifying features including impacts on prey availability and deterioration of food resource through:</p> <p>Mobilisation of underground contaminants disturbed</p> <p>Potential for pollution incidents from spillages, leakages etc from stored chemicals, fuel and oils on site.</p>	<p>The proposed development will not impact directly on any part of the River Derwent and Bassenthwaite Lake SAC; however, impacts on marine water quality are possible as a result of discharges of surface water made from the RLF and Conveyor to the Bellhouse Gill and Pow Beck, which eventually discharges to the sea to the south of St Bees approximately 2.8 km downstream of the development.</p> <p>Whilst the River Derwent and Bassenthwaite Lake SAC is 10.03 km to the north-east of the site, the point at which the River Derwent discharges to the sea is more than 18 km to the north of the Pow Beck. This is sufficiently distant that impacts on SAC qualifying features due to sediment-laden surface water are not expected (Chapter 17 Marine Environment, Environmental Statement, paragraph 17.29.19, West Cumbria Mining, 2018).</p> <p>In the absence of mitigation the release of pollutants into the marine environment could potentially impact on SAC qualifying features directly (if they are present in the vicinity of the Pow Beck where it discharges to sea), for example as a result of toxic effects, or indirectly, by impacting on the prey species that SAC qualifying features depend upon. There are also potential impacts associated with the discharge related to non-toxic inputs. These include the effects of pH, temperature, salinity and dissolved oxygen.</p> <p>Prior to the main construction period it is planned that a 6 month remediation phase will be required to treat pockets of contamination which may remain in areas of the site. Consequently no contamination will remain in areas that could be impacted during the operational phase of the development, and so no pathway exists for</p>	Yes	Yes

River Derwent and Bassenthwaite Lake SAC – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>the mobilisation of contaminants (Chapter 17 Marine Environment, Environmental Statement, West Cumbria Mining, 2018, paragraph 19.29.7).</p> <p>Bellhouse Gill and an unnamed tributary of the Pow Beck (both ephemeral watercourses) are intersected by the conveyor route. The conveyor will be buried beneath these ephemeral watercourses; following construction, the flow regime at these locations will return to pre-development conditions. There will therefore be no increases in flow rates or discharge volumes to Pow Beck (Chapter 17 Marine Environment, Environmental Statement, section 17.32.7, West Cumbria Mining, 2018). The conveyor route is enclosed, which will minimise the chance of contamination of local watercourses.</p> <p>Discharge and control measures will be adopted at the conveyor and rail loading facility sites (Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, sections 6.2 and 6.3, Flood Risk Assessment and Drainage Strategy, Environmental Statement, West Cumbria Mining, 2018; Sections 5.7 and 5.10 of the Draft Environmental Management Plan - Appendix E to Chapter 5 Project Description, Environmental Statement, West Cumbria Mining, 2018).</p> <p>During the operational phase, surface water runoff at the rail loading facility (RLF) site will be retained on-site in attenuation lagoons. Surface discharges to Pow Beck will be at a reduced rate compared to the current greenfield runoff rates. Whilst runoff volume will increase due to the increase in impermeable area, this excess volume will be discharged slowly after the peak flow has passed and will not increase flood flow rates in the Pow Beck. As with both the</p>		

River Derwent and Bassenthwaite Lake SAC – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>Marchon and the conveyor construction sites, water pollution controls, including the use of attenuation lagoons, will be implemented to minimise sediment and pollutant release to freshwater watercourses and hence the marine environment.</p> <p>Dilution effects within Bellhouse Gill and Pow Beck will also reduce the environmental concentrations of any contaminants present (though this is considered unlikely once good practice measures are in place) to the point where they are not predicted to have any significant impact on the marine environment (Chapter 17 Marine Environment, paragraph 17.29.21 – 17.29.23, Environmental Statement, West Cumbria Mining, 2018).</p> <p>The adoption of good practice measures, in conjunction with mixing and dilution effects of the freshwater watercourses (the Pow Beck discharges to sea 2.8 km downstream of the development site), mean that no significant pollution impact on the marine environment is predicted via the Pow Beck pathway (see Chapter 17, Marine Environment, paragraph 17.29.22, Environmental Statement, 2018), indeed any such impact is regarded as negligible.</p> <p>Consequently it is not expected that there will be discharge of pollutants to Pow Beck (including changes in pH, temperature, salinity, and dissolved oxygen) will impact directly or indirectly on any qualifying feature of the SAC that uses the marine environment.</p> <p>The hydrological assessment has concluded that, with respect to groundwater and surface water, no pathway is considered to exist between the proposed development and any other proposed development (Chapter 12 Hydrology & Hydrogeology,</p>		

River Derwent and Bassenthwaite Lake SAC – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>Section 12.8, Environmental Statement, West Cumbria Mining, 2018).</p> <p>As such an in-combination effect with other plans or projects is considered very unlikely, however, to ensure a comprehensive assessment, nearby licensable discharges to sea in the vicinity of the mouth of Pow Beck have nevertheless been investigated.</p> <p>The zone of influence (ZOI) of the proposed surface water runoff discharge to Saltom Bay has been calculated as approximately 162 m and is over 8 km (by sea) from the mouth of Pow Beck. Hence no in-combination effect is predicted between the two sources of surface water runoff associated with the proposed development.</p> <p>The closest licensed discharge to the mouth of Pow Beck is a United Utilities pumping station located at Nethertown, which has a permit to discharge to sea (permit no. 017470153) approximately 4 km south of the mouth of Pow Beck. However, under the conditions of the permit, the pumping station may only discharge to sea in emergency circumstances when the pumping station is inoperative as a result of e.g. electrical failure or rising main failure. No discharge occurs under normal circumstances. For this reason this discharge has been scoped out of the in-combination impact assessment.</p> <p>The United Utilities WwTW located at Braystones, south of Nethertown, discharges to sea via a long sea outfall (permit no. 017470152). The discharge point of this outfall is located approximately 7 km south from the mouth of Pow Beck and hence any combined effect between it and any discharges made via Pow Beck is very unlikely. Furthermore, the existing sewage discharge is discharged via diffuser(s) at a distance of ~2 km from shore and has</p>		

River Derwent and Bassenthwaite Lake SAC – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>an initial dilution factor generally considered appropriate for secondary treated sewage effluent. The existing discharge is therefore considered to have sufficient initial and secondary mixing to ensure that it will not produce cumulative or in-combination impacts with other discharges.</p> <p>The Sellafield outfalls extend ~2.1 km from shore into the north-eastern Irish Sea and are located approximately 8.8 km from the mouth of Pow Beck and hence, again, it is considered highly unlikely that the two plumes will interact. Furthermore, the two discharges are not similar; the proposed discharges to Pow Beck are ambient temperature freshwater which, with good practice guidelines in place, will not be contaminated, while the Sellafield discharge is a cooling water discharge, i.e. warm seawater. There is therefore no realistic likelihood of in-combination effects between the two discharges.</p> <p>There are no other projects which CCC is aware of in the marine environment in the proximity of the proposed mine that need to be included in an in-combination assessment. The NuGen Moorside development is currently on hold, and timescales, the nature and scope of the project, and its potential impacts are unknown. Therefore, no cumulative impact assessment is provided for this development.</p> <p>It is concluded that there will be no adverse effect on the integrity of the SAC (through impacts on the populations of the SAC qualifying species or through impacts on supporting habitats or species) through this pathway alone or in combination with other plans or projects.</p>		

River Derwent and Bassenthwaite Lake SAC – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
10	Subsidence effects under the terrestrial environment	Subsidence under the terrestrial environment as a result of sub-surface mining activities	<p>Any subsidence arising from onshore mining will not have an effect the River Derwent and Bassenthwaite Lake SAC, which is 10.03 km to the north-east of the site at its closest point. Subsidence effects will be highly localised, i.e. above the panels.</p> <p>In the absence of mitigation, it is possible that subsidence (and any associated seismic events induced by subsidence) arising from mining related activities may impact on the SAC qualifying species and the supporting habitats and species on which they depend, as a result of changes in sediment deposition.</p> <p>For the areas of onshore mining, the proposed partial extraction mining technique in combination with the use of paste backfill in mined areas may result in, as a worst case scenario, very low levels of subsidence under the terrestrial habitats (65% void back-filling is proposed). If subsidence does occur it will happen gradually.</p> <p>The proposed mining method under the terrestrial environment involves the backfilling of voids with waste material. The paste backfill involves waste rock being converted into a paste type material, which will consist of ground up rock, a cementitious additive and water. This will be pumped into the underground areas that have been mined. The deposited material, once hardened, provides additional stability underground (Briefing Note, Paste Plant Process, Appendix D to Chapter 5 Project Description, Environmental Statement, West Cumbria Mining, 2018).</p> <p>It is expected that the paste would fill 65% of the void space created by mining in the panels where paste backfill is employed (Appendix B to Chapter 5 Project Description, Environmental Statement, West Cumbria Mining, 2018). It is therefore planned, in the event that the</p>	Yes	Yes

River Derwent and Bassenthwaite Lake SAC – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>amount of waste is limited, to prioritise the paste backfill to areas that will be most sensitive to subsidence, such as the terrestrial areas (Appendix D to Chapter 5 Project Description, Environmental Statement, West Cumbria Mining, 2018).</p> <p>The maximum predicted subsidence arising from areas of multiple panel mining is 30 cm in the absence of paste backfill, which reduces to less than 15 cm when the same excavation is backfilled by 65% with paste. The maximum rate at which the subsidence will take place over the centre of a panel is 0.6 cm per day (without paste backfill) and less than 0.3 cm per day (with paste backfill) over a two-week period when the face of the panel is directly underneath (Appendix D to Chapter 5 Project Description, Environmental Statement, West Cumbria Mining, 2018). Subsidence, if it happens, will only occur during the operation phase of the development (if a drift collapses this is not predicted to result in subsidence at the surface): Appendix B, Section 3.3, Subsidence Briefing Note, Chapter 5 Project Description, Environmental Statement, West Cumbria Mining, 2018).</p> <p>Overall it is concluded that, whilst subsidence (and therefore associated seismic events induced by subsidence) may occur below onshore terrestrial habitat, such subsidence will be of limited magnitude and will be slow to develop. Consequently it is not expected that subsidence will impact directly or indirectly on the SAC's population of qualifying species or the supporting species or habitats on which they depend.</p> <p>As no impact through subsidence is predicted either onshore or offshore, it follows that no significant impact through induced seismicity (i.e. seismicity associated with and induced by subsidence) is expected.</p>		

River Derwent and Bassenthwaite Lake SAC – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>As no impact is predicted on the SAC's qualifying features via this pathway, there is no effect with which the effect of any other plan or project can combine. In any event, there are no other plans or projects known with subsidence impacts which could act in combination with the predicted subsidence from the WCM project and as such no scope of any in-combination impact via this pathway.</p> <p>It is concluded that there will be no adverse effect on the integrity of the SAC (through impacts on the populations of the SAC qualifying species or through impacts on supporting habitats or species) through this pathway alone or in combination with other plans or projects.</p>		
11	Subsidence effects under the marine environment	Subsidence under the marine environment as a result of sub-surface mining activities	<p>Any subsidence arising from onshore mining will not have an effect the River Derwent and Bassenthwaite Lake SAC, which is 10.03 km to the north-east of the site at its closest point. Subsidence effects will be highly localised, i.e. above the panels.</p> <p>In the absence of mitigation, it is possible that subsidence (and any associated seismic events induced by subsidence) arising from mining related activities may impact on the SAC qualifying species and the supporting habitats and species on which they depend, as a result of changes in sediment deposition.</p> <p>For the areas of offshore mining, the proposed partial extraction mining technique in combination with the use of paste backfill in mined areas may result in, as a worst case scenario, very low levels of subsidence under the marine habitats. If subsidence does occur it will happen gradually. The proposed mining method under the</p>	Yes	Yes

River Derwent and Bassenthwaite Lake SAC – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>marine environment (note that there is no coal extraction under St Bees Head SSSI and the MCZ) involves the backfilling of voids with waste material. The paste backfill involves waste rock being converted into a paste type material, which will consist of ground up rock, a cementitious additive and water. This will be pumped into the underground areas that have been mined. The deposited material, once hardened, provides additional stability underground (Briefing Note, Paste Plant Process, Appendix D to Chapter 5 Project Description, Environmental Statement, West Cumbria Mining, 2018).</p> <p>It is expected that the paste would fill 65% of the void space created by mining in the panels where paste backfill is employed (Appendix B to Chapter 5 Project Description, Environmental Statement, West Cumbria Mining, 2018). It is therefore planned, in the event that the amount of waste is limited, to prioritise the paste backfill to areas that will be most sensitive to subsidence, such as the terrestrial areas (Appendix D to Chapter 5 Project Description, Environmental Statement, West Cumbria Mining, 2018).</p> <p>The maximum predicted subsidence arising from areas of multiple panel mining is 30 cm in the absence of paste backfill, which reduces to less than 15 cm when the same excavation is backfilled by 65% with paste. The maximum rate at which the subsidence will take place over the centre of a panel is 0.6 cm per day (without paste backfill) and less than 0.3 cm per day (with paste backfill) over a two-week period when the face of the panel is directly underneath (Appendix D to Chapter 5 Project Description, Environmental Statement, West Cumbria Mining, 2018). Subsidence, if it happens, will only occur during the operation phase of the development (if a drift collapses this is not predicted to result in subsidence at the surface): Appendix B,</p>		

River Derwent and Bassenthwaite Lake SAC – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>Section 3.3, Subsidence Briefing Note, Chapter 5 Project Description, Environmental Statement, West Cumbria Mining, 2018).</p> <p>For the areas of offshore mining, as a result of the proposed partial extraction method and the use of paste backfill (as detailed above), approximately 10% of the offshore mining area may experience subsidence up to 15 cm, and approximately 50% may experience subsidence of up to 7.5 cm (Appendix B, Subsidence Briefing Note, Chapter 5 Project Description, Environmental Statement, West Cumbria Mining, 2018). As noted above, subsidence, if it occurs, will be slow to develop.</p> <p>Whilst subsidence (and associated seismic events induced by subsidence) has the potential to impact on marine biota, potentially resulting in an indirect effect on anadromous fish species (which are qualifying features of the River Derwent and Bassenthwaite Lake SAC), no significant effects are likely due to the small magnitude and slow rate of the predicted change (Chapter 17 Marine Environment, Section 17.30.13, Environmental Statement, West Cumbria Mining 2018).</p> <p>The marine assessment concludes that no significant impact is expected on the shore as a result of subsidence or associated seismic events under the marine environment (Chapter 17 Marine Environment, Section 17.30.11, Environmental Statement, West Cumbria Mining 2018). It also concludes that there is no significant effect from the project through subsidence or associated seismic events on the Solway Firth pSPA, which is the nearest European site (Chapter 17 Marine Environment, Section 17.30.12 et seq, Environmental Statement, West Cumbria Mining 2018). It can</p>		

River Derwent and Bassenthwaite Lake SAC – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>therefore be concluded that, whilst subsidence may occur above some of the mined areas offshore (i.e. beyond the MCZ), due to the slow nature of its development and the overlying 15-20m thick marine sediments, no significant impact is expected on the River Derwent and Bassenthwaite Lake SAC (the River Derwent discharges to the sea at Workington c.13 km to the north of the site).</p> <p>As no significant impact through subsidence is predicted either onshore or offshore, it follows that no significant impact through induced seismicity (i.e. seismicity associated with and induced by subsidence) is expected.</p> <p>There are no other plans or projects known with subsidence impacts which could act in combination with the predicted subsidence from the WCM project and as such no scope of any in-combination impact via this pathway.</p> <p>It is concluded that there will be no adverse effect on the integrity of the SAC (through impacts on the populations of the SAC qualifying species or through impacts on supporting habitats or species) through this pathway alone or in combination with other plans or projects.</p>		

Decommissioning Phase

Table 10: Impact mechanisms and pathways during the decommissioning phase of the development – River Derwent and Bassenthwaite Lake SAC

River Derwent and Bassenthwaite Lake SAC – decommissioning phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
1	Direct loss of or damage to terrestrial habitat – MMS, RLF/UC	Potential loss of terrestrial supporting habitat for SAC qualifying features through land-take	The interest features of the R Derwent and Bassenthwaite Lake SAC are aquatic hence there is no impact pathway from loss of or damage to terrestrial habitat. Please see paragraphs 6.23 et seq in Chapter 6, which provide a detailed assessment.	Yes	Yes
2	Disturbance of marine or terrestrial qualifying species (visual/noise/vibration) – MMS/RLF/UC/UM)	Potential for disruption and/or injury to qualifying features through noise/ vibration as a result of construction processes e.g. piling/drilling	<u>Visual /human disturbance</u> The interest features of the R Derwent and Bassenthwaite Lake SAC are aquatic hence this impact pathway has no relevance. Please see paragraphs 6.46 et seq in Chapter 6, which provides a detailed assessment. <u>Noise and vibration</u> There is no mechanism by which decommissioning related noise and vibration can impact on the River Derwent and Bassenthwaite Lake SAC. The nearest part of the SAC is 10.03 km to the north-east of the site and the point at which it discharges to the sea is around 13 km to the north of the site at Workington. This is well beyond the limits of any predicted noise and vibration effects. This is well beyond the limits of any noise and vibration effects. There will be no decommissioning related noise and vibration related impacts on marine receptors as no offshore works or mining activities will take place in this phase. Please see paragraphs 6.51 et seq in Chapter 6, which provides a	Yes	Yes

River Derwent and Bassenthwaite Lake SAC – decommissioning phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			detailed assessment.		
3	Direct loss of or damage to marine habitat or disturbance to marine species from scouring and/or sedimentation from any discharges via the Saltom Bay outfall	<p>Potential effect on migratory populations through:</p> <p>Deterioration of food resource;</p> <p>Reduction in prey availability</p>	<p>The proposed development will not impact directly on any part of the River Derwent and Bassenthwaite Lake SAC. Impacts on marine habitat or disturbance to marine species from scouring and/or sedimentation are possible as a result of discharges of surface water made through the existing sea outfall pipe.</p> <p>The River Derwent discharges to the sea at Workington c.13 km to the north of the site. This is sufficiently distant that scour / sedimentation impacts on animal movement or fish migration linked to the SAC are not expected as previously predicted for the construction phase of the development (Chapter 17 Marine Environment, Environmental Statement, paragraph 17.29.19, West Cumbria Mining, 2018) and in any event the surface water discharge will be treated prior to discharge. The same conclusion is reached for the decommissioning phase.</p> <p>Once the mine is closed the above ground structures on the site will be removed and the land reinstated and planted for ecology and recreation. The underground surface water attenuation tank is likely to be disconnected and decommissioned rather than removed to minimise environmental disturbance. Disconnection of the attenuation tank will be the final phase of decommissioning so that it remains in use until the final restoration scheme is in place. It is proposed to replace the storage provided by the attenuation tank with a pond and wetland feature, with an overflow to the pipeline that discharges into the sea (Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, Flood Risk Assessment and Drainage Strategy, section 6.1.4.4, Environmental Statement, West Cumbria Mining,</p>	Yes	Yes

River Derwent and Bassenthwaite Lake SAC – decommissioning phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>2018)..</p> <p>Discharge rates from the restored site will be reduced compared to the operational phase, as the impermeable surfaces will be removed and replaced by a more retentive naturalised catchment. The proposed pond and wetland feature will also provide attenuation during high rainfall events (Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, Flood Risk Assessment and Drainage Strategy, section 6.1.4.4, Environmental Statement, West Cumbria Mining, 2018).</p> <p>During the decommissioning process, the proposed development will minimise the potential for scour on the intertidal area around the outfall by limiting, wherever practicable, surface water discharge to when the outlet point is submerged. The discharge pipe runs down the foreshore and terminates in the intertidal zone (it is only fully exposed around low water springs tides). By only discharging surface water when the outlet point is submerged, the potential for scour at the proposed flow rates will be minimised (Chapter 17 Marine Environment, Environmental Statement, section 17.31.5, West Cumbria Mining, 2018). In order to minimise potential scour, the maximum flow rate of the discharge will be limited to 25 l/s, which will only be reached during and following heavy rainfall events.</p> <p>All surface water from areas of hard-standing and roofs will be captured during the decommissioning phase and directed via silt traps and oil interceptors to the underground water storage tank for testing prior to discharge to sea using the existing outfall. This will ensure that the maximum permitted flow rate of 25 l/s is not exceeded. However, the interception of surface water will change</p>		

River Derwent and Bassenthwaite Lake SAC – decommissioning phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>during the decommissioning phase as building and other infrastructure are removed.</p> <p>Water which has passed through oil and silt traps will be discharged using the existing outfall at a maximum flow rate of 25 l/s. In periods of heavy rainfall, flows will continue to be attenuated on site through storage (Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, Flood Risk Assessment and Drainage Strategy, section 6.1.4.4, Environmental Statement, West Cumbria Mining, 2018).</p> <p>Effects during the decommissioning phase are expected to be no worse than the effects predicted for the construction phase. When the discharge point is exposed (i.e. not submerged), modelling results for the construction phase indicate that the proposed flow rate would be sufficient to mobilise fine sand material. However, the sediments at the discharge point location consist of coarse sands (and cobbles and boulders), and so any re-suspended particles are likely to settle out very quickly. It is therefore concluded that any effect on water quality and biota will be localised and of minor significance during the construction phase (Chapter 17 Marine Environment, Environmental Statement, section 17.29.9 & 17.33.7, West Cumbria Mining, 2018) and also during the decommissioning phase.</p> <p>Modelling work has concluded that the Zone of Influence of the discharge into the sea, when combined with the existing leachate discharge, is 162m from the outfall, which means that the River Derwent and Bassenthwaite Lake SAC (which discharges to the sea at Workington c.13 km to the north of the site) and its qualifying features will not be directly impacted (Chapter 17 Marine Environment, Environmental Statement, section 17.34.7 et seq, West</p>		

River Derwent and Bassenthwaite Lake SAC – decommissioning phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>Cumbria Mining, 2018). Furthermore, as the proposed discharge is not expected to have a significant effect on marine fauna, no indirect impacts on SAC qualifying features are expected either, e.g. as a result of impacts on prey species.</p> <p>Runoff volumes and flow rates are likely to be lower than during the operational phase, and so the impacts of the discharge are likely to be the same as or less than those predicted for the operational phase. The proposed mitigation measures and the maximum discharge rate (together with rapid mixing and dispersal in the marine environment) will ensure that the effects of the discharge are limited in their extent.</p> <p>Consequently, as the proposed discharge is not expected to have a significant effect on marine fauna, no significant effect is expected in respect of salmon, otter or lamprey species (the only qualifying features of the SAC that use the marine environment) using the River Derwent estuary, which is c. 13 km to the north of the development site. Similarly, it is not expected that scour or sedimentation associated with the discharge of surface water will impact directly or indirectly on the SAC's population of qualifying features or their supporting habitats or species.</p> <p>As such, an in-combination effect with other plans or projects is considered very unlikely, however, to ensure a comprehensive assessment, other discharges from other plans and projects have also been considered (if they include a proposed discharge to sea which could combine with the 162m zone of influence from the Saltom Bay outfall) (Chapter 17 Marine Environment, Environmental Statement, sections 17.34.1 to 17.34.5, West Cumbria Mining, 2018).</p>		

River Derwent and Bassenthwaite Lake SAC – decommissioning phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>The zone of influence (ZOI) of the proposed surface water runoff discharge to Saltom Bay has been calculated as approximately 162 m and is over 8 km (by sea) from the mouth of Pow Beck. Hence no in-combination effect is predicted between the two sources of surface water runoff associated with the proposed development. The following licensable discharges to sea are within the vicinity of Saltom Bay and have the potential to interact with the surface water runoff discharges from the Saltom Bay outfall associated with the proposed development (Chapter 17 , paragraph 17.34, of the Environmental Statement):</p> <p>A private sewer discharge outfall is located approximately 350 m from the proposed WCM discharge point and it is permitted to discharge no more than 0.2 m³ per day. The permit associated with this discharge states that the discharge must have no adverse visible effect on the receiving environment. Modelling shows that the private sewer discharge from a pharmacy in Kells (to Saltom Bay) is outside the zone of influence for the WCM discharge (Chapter 17 Marine Environment, paragraph 17.34.7, Environmental Statement, 2018). This is the case even when the outfall is fully exposed at low tide. Due to the separation distance and the very small volume of this discharge, a significant in-combination effect is not predicted to occur (Chapter 17 Marine Environment, paragraph 17.34.8, Environmental Statement, 2018).</p> <p>A United Utilities pumping station discharge (to Saltom Bay) is also outside the zone of influence for the WCM discharge (Chapter 17 Marine Environment, paragraph 17.34.7, Environmental Statement, 2018). The pumping station may only discharge to sea in emergency</p>		

River Derwent and Bassenthwaite Lake SAC – decommissioning phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>circumstances when the pumping station is inoperative. No discharge occurs under normal circumstances. Due to the operational restrictions on this outfall, a significant in-combination effect is not predicted (Chapter 17 Marine Environment, paragraph 17.34.9, Environmental Statement, 2018).</p> <p>The Sellafield outfalls extend ~2.1 km from shore into the north-eastern Irish Sea and are located approximately 14.5 km directly south of the Saltom Bay discharge point (~17 km by sea). The Sellafield discharge outfall (at Seascale) is therefore also outside the zone of influence for the WCM discharge (Chapter 17 Marine Environment, paragraph 17.34.7, Environmental Statement, 2018). An in-combination effect is not predicted to occur due to the separation distance (Chapter 17 Marine Environment, paragraph 17.34.11, Environmental Statement, 2018).</p> <p>The United Utilities wastewater treatment works discharge (at Parton, north of Whitehaven) is located approximately 5 km from the proposed discharge point in Saltom Bay. The discharge point of this outfall is therefore also outside the zone of influence for the WCM discharge (Chapter 17 Marine Environment, paragraph 17.34.7, Environmental Statement, 2018). Furthermore, the existing sewage discharge is discharged via diffuser(s) at a distance of ~1.9 km from shore, in the main current flows of the Solway Firth, and has an initial dilution factor of 50, which is generally considered appropriate for secondary treated sewage effluent. The United Utilities wastewater treatment works discharge is therefore considered to have sufficient initial and secondary mixing to ensure that it will not produce cumulative or in-combination impacts with the Saltom Bay discharge. (Chapter 17 Marine Environment, paragraph 17.34.10, Environmental</p>		

River Derwent and Bassenthwaite Lake SAC – decommissioning phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>Statement, 2018).</p> <p>There are no other projects which CCC is aware of in the marine environment in the proximity of the proposed mine that need to be included in an in-combination assessment. The NuGen Moorside development is currently on hold, and timescales, the nature and scope of the project, and its potential impacts are unknown. Therefore, no cumulative impact assessment is provided for this development.</p> <p>It is therefore concluded that the discharge will not have a significant effect on the marine environment, either alone or in combination with other discharges from other plans or projects; predicted effects during the decommissioning phase will be the same as or less than the predicted effects during the construction phase (Chapter 17 Marine Environment, Environmental Statement, section 17.29.8 – 17.29.11 & 17.34.7, West Cumbria Mining, 2018).</p> <p>It is concluded that there will be no adverse effect on the integrity of the SAC (through impacts on the populations of the SAC qualifying species or through impacts on supporting habitats or species) through this pathway alone or in combination with other plans or projects.</p>		
4	Direct loss of or damage to marine habitat or disturbance to marine species from scouring	<p>Potential effect on migratory populations through:</p> <p>Deterioration of food resource;</p>	<p>The proposed development will not impact directly on any part of the River Derwent and Bassenthwaite Lake SAC; however, impacts on marine water quality are possible as a result of discharges of surface water made from the RLF and Conveyor to the Bellhouse Gill and Pow Beck, which eventually discharges to the sea to the south of St Bees approximately 2.8 km downstream of the development.</p> <p>Whilst the River Derwent and Bassenthwaite Lake SAC is 10.03 km</p>	Yes	Yes

River Derwent and Bassenthwaite Lake SAC – decommissioning phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
	and/or sedimentation from any discharges via Pow Beck	Reduction in prey availability	<p>to the north-east of the site, the point at which the River Derwent discharges to the sea is more than 18 km to the north of the Pow Beck. This is sufficiently distant that impacts on SAC qualifying features due to sediment-laden surface water are not expected (Chapter 17 Marine Environment, Environmental Statement, paragraph 17.29.19, West Cumbria Mining, 2018).</p> <p>Surface water flows, if uncontrolled, have the potential to entrain sediments and contaminants generated by the decommissioning of the proposed development, which may have negative impacts on marine water quality and marine biota. In addition, the flows themselves, if increased, will have the potential to cause scouring around the mouth of Pow Beck.</p> <p>In order to minimise potential scour, discharge and control measures will be adopted at the conveyor and rail loading facility sites (Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, sections 6.2 and 6.3, Flood Risk Assessment and Drainage Strategy, Environmental Statement, West Cumbria Mining, 2018; Sections 5.7 and 5.10 of the Draft Environmental Management Plan - Appendix E to Chapter 5 Project Description, Environmental Statement, West Cumbria Mining, 2018).</p> <p>Bellhouse Gill and an unnamed tributary of the Pow Beck (both ephemeral watercourses) are intersected by the conveyor route. The conveyor will be buried beneath these ephemeral watercourses and during the operation (and subsequent decommissioning) phase the flow regime at these locations will return to pre-development conditions and this is expected to remain the case during the decommissioning phase. There will therefore be no increases in flow rates or discharge volumes to Pow Beck during the operation phase and this is expected to continue during the decommissioning phase</p>		

River Derwent and Bassenthwaite Lake SAC – decommissioning phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>as well. Consequently no impacts at St Bees beach due to scour are predicted.</p> <p>Once the mine is closed the above ground structures on the site will be removed and the land reinstated and planted for ecology and recreation. It is expected that the drainage infrastructure would remain in place and continue to function, although removing the buildings and ceasing operation would reduce the runoff and sediment generation from the site. If all the infrastructure is removed, including the drainage system, then the site would revert to its pre-development state.</p> <p>After construction the conveyor box will be backfilled with low permeability material in a way that will minimise ingress and tracking of surface water along the outside of the box structure. At this point the difference between the flow regimes pre and post construction is expected to be negligible (Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, Flood Risk Assessment and Drainage Strategy, section 6.2.1.2, Environmental Statement, West Cumbria Mining, 2018). This situation is expected to continue during the decommissioning phase as the conveyor will be left in situ.</p> <p>During the decommissioning phase the storage lagoons, wetland, drainage pipes and outfalls to receiving watercourses that serve the RLF will remain.</p> <p>Discharge rates from the restored site will be reduced compared to the operational phase, as the impermeable surfaces will be removed and replaced by more retentive naturalised catchment.</p>		

River Derwent and Bassenthwaite Lake SAC – decommissioning phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>Consequently, impacts associated with scour at the mouth of the Pow Beck at St Bees Beach are not predicted to occur (Chapter 17 Marine Environment, Environmental Statement, sections 17.29.20 to 17.29.23, West Cumbria Mining, 2018).</p> <p>It is concluded that there will be no adverse effect on the integrity of the SAC (through impacts on the populations of the SAC qualifying species or through impacts on supporting habitats or species) through this pathway alone or in combination with other plans or projects.</p> <p>In relation to the risk of scouring there is predicted to be no impact at the point where the Pow Beck discharges to the sea from WCM's project and so no risk of any in combination impact.</p>		
5	Dust and other airborne contamination of marine and terrestrial habitats – MMS/RLF/UC	<p>Potential effect on migratory populations through:</p> <p>Deterioration of food resource;</p> <p>Reduction in prey availability</p>	<p>Please see paragraphs 6.157 et seq in Chapter 6, which provide a detailed assessment of the effects of dust.</p> <p>Please see paragraphs 6.161 et seq in Chapter 6, which provide a detailed assessment of the effects of NOx.</p> <p>Please see paragraphs 6.163 et seq in Chapter 6, which provide a detailed assessment of the effects of N deposition.</p> <p>It is important to note that the analysis of air quality impacts presented in the above sections represents, as is legally required, a cumulative assessment of the proposed development (i.e. in combination with other plans and projects). This covers dust, traffic, and other operational controlled emissions and is explained in detail</p>	Yes	Yes

River Derwent and Bassenthwaite Lake SAC – decommissioning phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			in the air quality assessment (Chapter 15 Air Quality, section 15.7, paragraph 15.7.1 - 15.7.4 [dust], paragraph 15.7.5 – 15.7.10 [traffic], paragraph 15.7.11 – 15.7.12 [controlled emissions], Environmental Statement, 2018)).		
6	Deterioration of marine water quality as a result of sediment-laden surface water run-off during decommissioning from main mine site via the Saltom Bay outfall	<p>Potential effect on qualifying features including impacts on prey availability and deterioration of food resource through:</p> <p>Escape of sediment-entrained surface water</p>	<p>The proposed development will not impact directly on any part of the River Derwent and Bassenthwaite Lake SAC.</p> <p>However, impacts on marine water quality are possible as a result of discharges of surface water made through the existing sea outfall pipe.</p> <p>The River Derwent discharges to the sea at Workington c.13 km to the north of the site. This is sufficiently distant that water quality related impacts on animal movement or fish migration linked to the SAC are not expected (Chapter 17 Marine Environment, Environmental Statement, paragraph 17.29.19, West Cumbria Mining, 2018) and in any event the surface water discharge will be treated prior to discharge.</p> <p>The discharge of water to sea during the decommissioning phase could have similar impacts as those predicted during the operational phase. In the absence of mitigation measures, the release of sediment-laden surface water into the marine environment could potentially impact on SAC qualifying features directly (if they are present in the vicinity of the discharge pipe), for example as a result of habitat deterioration due to sediment laden water, or indirectly, by impacting on the prey species or habitats that SAC qualifying features depend upon.</p>	Yes	Yes

River Derwent and Bassenthwaite Lake SAC – decommissioning phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>However, the effects of suspended solids on the marine environment will be fully mitigated during the decommissioning phase. The planned decommissioning phase is over 50 years away, and WCM expect that in the final few years leading up to decommissioning, close liaison will be required with the environmental regulatory body(ies) in force at the time to develop a detailed decommissioning plan which takes full account of the requirement to minimise environmental impacts.</p> <p>All surface water from areas of hard-standing and roofs will be captured during the decommissioning phase and directed via silt traps (and oil interceptors) to the underground water storage tank for testing prior to discharge to sea using the existing outfall. However, the interception of surface water will change during the decommissioning phase as building and other infrastructure are removed.</p> <p>Storm water flows will be accommodated in the storm water attenuation tank on site (total capacity 6,500m³) (Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, Flood Risk Assessment and Drainage Strategy, Section 6.1.4.3, Environmental Statement, West Cumbria Mining, 2018). In exceptional circumstances, a storm water discharge may be required. Storm water flows will go to sea via the existing discharge point, and they will first be passed through silt traps and oil interceptors (although it should be noted that during the decommissioning phase silt mobilisation will be limited once the bund vegetation is established, and no oils will be stored outside). All pollutants will be controlled through the adoption of best practice measures (Draft Environmental Management Plan - Appendix E to</p>		

River Derwent and Bassenthwaite Lake SAC – decommissioning phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>Chapter 5 Project Description, Sections 5.7 and 5.10, Environmental Statement, West Cumbria Mining, 2018).</p> <p>The discharge will be at a maximum flow rate of 25 l/s (Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, Flood Risk Assessment and Drainage Strategy, section 6.1.4.2 et seq, Environmental Statement, West Cumbria Mining, 2018). The attenuation measures described above will ensure that the maximum permitted flow rate of 25 l/s is not exceeded.</p> <p>Discharged surface water will necessarily have to achieve the environmental permit standard that will be set by the consenting authority (Chapter 5, Environmental Statement, Appendix E, Section 6, West Cumbria Mining, 2018; Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, Flood Risk Assessment and Drainage Strategy, section 6.1.3.3, Environmental Statement, West Cumbria Mining, 2018). A Marine Environmental Monitoring Plan will be implemented to assess the potential impacts of the discharge (Chapter 17 Marine Environment, Appendix C, paragraph 4.12, Environmental Statement, West Cumbria Mining, 2018).</p> <p>Once the mine is closed the above ground structures on the site will be removed and the land reinstated and planted for ecology and recreation. The underground surface water attenuation tank is likely to be disconnected and decommissioned rather than removed to minimise environmental disturbance. Disconnection of the attenuation tank will be the final phase of decommissioning so that it remains in use until the final restoration scheme is in place. It is proposed to replace the storage provided by the attenuation tank with a pond and wetland feature, with an overflow to the pipeline that</p>		

River Derwent and Bassenthwaite Lake SAC – decommissioning phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>discharges into the sea (Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, Flood Risk Assessment and Drainage Strategy, section 6.1.4.4, Environmental Statement, West Cumbria Mining, 2018).</p> <p>Discharge rates from the restored site will be reduced compared to the operational phase, as the impermeable surfaces will be removed and replaced by more retentive naturalised catchment. The proposed pond and wetland feature will also provide attenuation during high rainfall events.</p> <p>The ongoing discharge of surface water to sea could have impacts on marine water quality and local marine biota. While contaminants in the restored site are not predicted to be significant, entrainment of sediments could lead to increases in turbidity and smothering effects on biota. Deterioration of marine water quality is not likely due to the provision of appropriate water treatment, which will necessarily have to achieve the environmental permit standard that will be set by the consenting authority (Chapter 5, Environmental Statement, Appendix E, Section 6, West Cumbria Mining, 2018; Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, Flood Risk Assessment and Drainage Strategy, Environmental Statement, West Cumbria Mining, 2018 sets out details of the water treatment facilities during operation [section 6.1.4.4]).</p> <p>The input of freshwater into the marine environment could also impact marine biota via salinity stress. The discharge would need to be subject to a discharge permit, and any and all conditions of the discharge permit will have to be adhered to. Although runoff volumes and flow rates are likely to be lower than during the operational phase, given the permanent nature of the discharge, it is likely that</p>		

River Derwent and Bassenthwaite Lake SAC – decommissioning phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>the impacts of the discharge post decommissioning would continue to be minor.</p> <p>Modelling work has concluded that the Zone of Influence of the discharge into the sea, when combined with the existing leachate discharge, is 162m from the outfall, which means that the River Derwent and Bassenthwaite Lake SAC and its qualifying features will not be directly impacted (Chapter 17 Marine Environment, Environmental Statement, section 17.34.7 et seq, West Cumbria Mining, 2018). As the proposed discharge is not expected to have a significant effect on marine fauna, no indirect impacts on SAC qualifying features are expected either, e.g. as a result of impacts on prey species.</p> <p>The proposed mitigation measures and the maximum discharge rate (together with rapid mixing and dispersal in the marine environment) will ensure that the effects of the discharge are limited in their extent. No significant effects are likely on the marine environment (Chapter 17 Marine Environment, paragraph 17.33.8, Environmental Statement, West Cumbria Mining, 2018), indeed any such impact is regarded as negligible. Consequently it is not expected that the discharge of sediment laden surface water will impact directly or indirectly on salmon, otter, or lamprey species (the only qualifying features of the SAC that use the marine environment) using the River Derwent estuary, which is c. 13 km to the north of the development site.</p> <p>The hydrological assessment has concluded that, with respect to groundwater and surface water, no pathway is considered to exist between the proposed development and any other proposed</p>		

River Derwent and Bassenthwaite Lake SAC – decommissioning phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>development (Chapter 12 Hydrology & Hydrogeology, Section 12.8, Environmental Statement, West Cumbria Mining, 2018). As such, an in-combination effect with other plans or projects is considered very unlikely, however, to ensure a comprehensive assessment, other discharges from other plans and projects have also been considered (if they include a proposed discharge to sea which could combine with the 162m zone of influence from the Saltom Bay outfall) (Chapter 17 Marine Environment, Environmental Statement, section 17.34.1 et seq, West Cumbria Mining, 2018).</p> <p>The zone of influence (ZOI) of the proposed surface water runoff discharge to Saltom Bay has been calculated as approximately 162 m and is over 8 km (by sea) from the mouth of Pow Beck. Hence no in-combination effect is predicted between the two sources of surface water runoff associated with the proposed development.</p> <p>The following licensable discharges to sea are within the vicinity of Saltom Bay and have the potential to interact with the surface water runoff discharges from the Saltom Bay outfall associated with the proposed development (Chapter 17 , paragraph 17.34, of the Environmental Statement):</p> <p>A private sewer discharge outfall is located approximately 350 m from the proposed WCM discharge point and it is permitted to discharge no more than 0.2 m³ per day. The permit associated with this discharge states that the discharge must have no adverse visible effect on the receiving environment. Modelling shows that the private sewer discharge from a pharmacy in Kells (to Saltom Bay) is outside the zone of influence for the WCM discharge (Chapter 17 Marine Environment, paragraph 17.34.7, Environmental Statement, 2018).</p>		

River Derwent and Bassenthwaite Lake SAC – decommissioning phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>This is the case even when the outfall is fully exposed at low tide. Due to the separation distance and the very small volume of this discharge, a significant in-combination effect is not predicted to occur (Chapter 17 Marine Environment, paragraph 17.34.8, Environmental Statement, 2018).</p> <p>A United Utilities pumping station discharge (to Saltom Bay) is also outside the zone of influence for the WCM discharge (Chapter 17 Marine Environment, paragraph 17.34.7, Environmental Statement, 2018). The pumping station may only discharge to sea in emergency circumstances when the pumping station is inoperative. No discharge occurs under normal circumstances. Due to the operational restrictions on this outfall, a significant in-combination effect is not predicted (Chapter 17 Marine Environment, paragraph 17.34.9, Environmental Statement, 2018).</p> <p>The Sellafield outfalls extend ~2.1 km from shore into the north-eastern Irish Sea and are located approximately 14.5 km directly south of the Saltom Bay discharge point (~17 km by sea). The Sellafield discharge outfall (at Seascale) is therefore also outside the zone of influence for the WCM discharge (Chapter 17 Marine Environment, paragraph 17.34.7, Environmental Statement, 2018). An in-combination effect is not predicted to occur due to the separation distance (Chapter 17 Marine Environment, paragraph 17.34.11, Environmental Statement, 2018).</p> <p>The United Utilities wastewater treatment works discharge (at Parton, north of Whitehaven) is located approximately 5 km from the proposed discharge point in Saltom Bay. The discharge point of this outfall is therefore also outside the zone of influence for the WCM</p>		

River Derwent and Bassenthwaite Lake SAC – decommissioning phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>discharge (Chapter 17 Marine Environment, paragraph 17.34.7, Environmental Statement, 2018). Furthermore, the existing sewage discharge is discharged via diffuser(s) at a distance of ~1.9 km from shore, in the main current flows of the Solway Firth, and has an initial dilution factor of 50, which is generally considered appropriate for secondary treated sewage effluent. The United Utilities wastewater treatment works discharge is therefore considered to have sufficient initial and secondary mixing to ensure that it will not produce cumulative or in-combination impacts with the Saltom Bay discharge. (Chapter 17 Marine Environment, paragraph 17.34.10, Environmental Statement, 2018).</p> <p>There are no other projects which CCC is aware of in the marine environment in the proximity of the proposed mine that need to be included in an in-combination assessment. The NuGen Moorside development is currently on hold, and timescales, the nature and scope of the project, and its potential impacts are unknown. Therefore, no cumulative impact assessment is provided for this development.</p> <p>It is therefore concluded that the discharge will not have a significant effect on the marine environment, either alone or in combination with other discharges from other plans or projects; predicted effects during the decommissioning phase will be the same as or less than the predicted effects during the construction phase (Chapter 17 Marine Environment, Environmental Statement, sections 17.29.8 to 17.29.11 and 17.34.7, West Cumbria Mining, 2018).</p> <p>It is concluded that there will be no adverse effect on the integrity of the SAC (through impacts on the populations of the SAC qualifying</p>		

River Derwent and Bassenthwaite Lake SAC – decommissioning phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			species or through impacts on supporting habitats or species) through this pathway alone or in combination with other plans or projects.		
7	Deterioration of marine water quality as a result of disturbance of contaminated land and mobilisation of pollutants (including changes in pH, temperature, salinity, and dissolved oxygen) discharged via Saltom Bay outfall	<p>Potential effect on qualifying features including impacts on prey availability and deterioration of food resource through:</p> <p>Mobilisation of underground contaminants disturbed</p> <p>Potential for pollution incidents from spillages, leakages etc from stored chemicals, fuel and oils on site.</p>	<p>The proposed development will not impact directly on any part of the River Derwent and Bassenthwaite Lake SAC. Impacts on marine water quality are possible as a result of discharges of surface water made through the existing sea outfall pipe.</p> <p>The River Derwent discharges to the sea at Workington c.13 km to the north of the site. This is sufficiently distant that water quality related impacts on animal movement or fish migration (salmon, otter, and lamprey species are qualifying features of the SAC) linked to the SAC are not expected (Chapter 17 Marine Environment, Environmental Statement, paragraph 17.29.19, West Cumbria Mining, 2018) and in any event the surface water discharge will be treated prior to discharge.</p> <p>In the absence of mitigation measures, the release of pollutants into the marine environment could potentially impact on SAC qualifying features directly (if they are present in the vicinity of the discharge pipe), for example as a result of toxic effects, or indirectly, by impacting on the prey species that SAC qualifying features depend upon.</p> <p>There are potential impacts associated with the discharge and these are related to non-toxic inputs. These include the effects of pH, temperature, salinity and dissolved oxygen. The marine assessment has concluded that, during the construction phase, the proposed discharge of surface water into the marine environment is not likely to have a significant effect on pH, salinity, water temperature of</p>	Yes	Yes

River Derwent and Bassenthwaite Lake SAC – decommissioning phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>dissolved oxygen (Chapter 17 Marine Environment, Environmental Statement, West Cumbria Mining, 2018, paragraphs 17.29.12 [pH], 17.29.14-17 [salinity], 17.29.13 [water temperature], 17.29.18 [dissolved oxygen]). Conditions during the decommissioning phase are expected to be the same or better than those predicted for the construction phase.</p> <p>However, the effects of pollutants on the marine environment will be fully mitigated during the decommissioning phase. The planned decommissioning phase is over 50 years away, and WCM expect that in the final few years leading up to decommissioning, close liaison will be required with the environmental regulatory body(ies) in force at the time to develop a detailed decommissioning plan which takes full account of the requirement to minimise environmental impacts.</p> <p>All surface water from areas of hard-standing and roofs will be captured during the decommissioning phase and directed via silt traps and oil interceptors to the underground water storage tank for testing prior to discharge to sea using the existing outfall. However, the interception of surface water will change during the decommissioning phase as buildings and other infrastructure are removed.</p> <p>The discharge will be at a maximum flow rate of 25 l/s (Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, Flood Risk Assessment and Drainage Strategy, section 6.1.4.2 et seq, Environmental Statement, West Cumbria Mining, 2018). The attenuation measures described above will ensure that the maximum permitted flow rate of 25 l/s is not exceeded.</p>		

River Derwent and Bassenthwaite Lake SAC – decommissioning phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>Discharged surface water will necessarily have to achieve the environmental permit standard that will be set by the consenting authority (Chapter 5, Environmental Statement, Appendix E, Section 6, West Cumbria Mining, 2018; Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, Flood Risk Assessment and Drainage Strategy, section 6.1.3.3, Environmental Statement, West Cumbria Mining, 2018). All other pollutants will be controlled through the adoption of best practice measures (Draft Environmental Management Plan - Appendix E to Chapter 5 Project Description, Sections 5.7 and 5.10, Environmental Statement, West Cumbria Mining, 2018). A Marine Environmental Monitoring Plan will be implemented to assess the potential impacts of the discharge (Chapter 17 Marine Environment, Appendix C, paragraph 4.12, Environmental Statement, West Cumbria Mining, 2018).</p> <p>Once the mine is closed the above ground structures on the site will be removed and the land reinstated and planted for ecology and recreation. The underground surface water attenuation tank is likely to be disconnected and decommissioned rather than removed to minimise environmental disturbance. Disconnection of the attenuation tank will be the final phase of decommissioning so that it remains in use until the final restoration scheme is in place. It is proposed to replace the storage provided by the attenuation tank with a pond and wetland feature, with an overflow to the pipeline that discharges into the sea.</p> <p>Discharge rates from the restored site will be reduced compared to the operational phase, as the impermeable surfaces will be removed and replaced by a more retentive naturalised catchment. The</p>		

River Derwent and Bassenthwaite Lake SAC – decommissioning phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>proposed pond and wetland feature will also provide attenuation during high rainfall events (Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, Flood Risk Assessment and Drainage Strategy, section 6.1.4.4, Environmental Statement, West Cumbria Mining, 2018). Modelling work has concluded that the Zone of Influence of the discharge into the sea, when combined with the existing leachate discharge, is 162m from the outfall, which means that the River Derwent and Bassenthwaite Lake SAC (which discharges to the sea at Workington c.13 km to the north of the site) and its qualifying features will not be directly impacted (Chapter 17 Marine Environment, Environmental Statement, section 17.34.7 et seq, West Cumbria Mining, 2018). As the proposed discharge is not expected to have a significant effect on marine fauna, no indirect impacts on SAC qualifying features are expected either, e.g. as a result of impacts on prey species.</p> <p>The proposed mitigation measures and the maximum discharge rate (together with rapid mixing and dispersal in the marine environment) will ensure that the effects of the discharge are limited in their extent. No significant effects are likely on the marine environment (Chapter 17 Marine Environment, paragraph 17.29.6, Environmental Statement, West Cumbria Mining, 2018). During the decommissioning phase runoff volumes and flow rates are likely to be lower than during the operational phase: given the permanent nature of the discharge, it is likely that the impacts of the discharge post decommissioning would continue to be minor. Taking this into account it is therefore concluded that any effect on water quality and biota will be localised and of minor significance (Chapter 17 Marine Environment, Environmental Statement, section 17.33.8, West Cumbria Mining, 2018).</p>		

River Derwent and Bassenthwaite Lake SAC – decommissioning phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>Consequently it is not expected that the discharge of pollutants (including changes in pH, temperature, salinity, and dissolved oxygen) will impact directly or indirectly on otter, salmon or lamprey species (the only qualifying features of the SAC that use the marine environment) using the River Derwent estuary, which is c. 13 km to the north of the development site.</p> <p>The hydrological assessment has concluded that, with respect to groundwater and surface water, no pathway is considered to exist between the proposed development and any other proposed development (Chapter 12 Hydrology & Hydrogeology, Section 12.8, Environmental Statement, West Cumbria Mining, 2018).</p> <p>As such, an in-combination effect with other plans or projects is considered very unlikely, however, to ensure a comprehensive assessment, other discharges from other plans and projects have also been considered (if they include a proposed discharge to sea which could combine with the 162m zone of influence from the Saltom Bay outfall) (Chapter 17 Marine Environment, Environmental Statement, section 17.34.1 et seq, West Cumbria Mining, 2018).</p> <p>The zone of influence (ZOI) of the proposed surface water runoff discharge to Saltom Bay has been calculated as approximately 162 m and is over 8 km (by sea) from the mouth of Pow Beck. Hence no in-combination effect is predicted between the two sources of surface water runoff associated with the proposed development. The following licensable discharges to sea are within the vicinity of Saltom Bay and have the potential to interact with the surface water runoff discharges from the Saltom Bay outfall associated with the proposed</p>		

River Derwent and Bassenthwaite Lake SAC – decommissioning phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>development (Chapter 17 , paragraph 17.34, of the Environmental Statement):</p> <p>A private sewer discharge outfall is located approximately 350 m from the proposed WCM discharge point and it is permitted to discharge no more than 0.2 m³ per day. The permit associated with this discharge states that the discharge must have no adverse visible effect on the receiving environment. Modelling shows that the private sewer discharge from a pharmacy in Kells (to Saltom Bay) is outside the zone of influence for the WCM discharge (Chapter 17 Marine Environment, paragraph 17.34.7, Environmental Statement, 2018). This is the case even when the outfall is fully exposed at low tide. Due to the separation distance and the very small volume of this discharge, a significant in-combination effect is not predicted to occur (Chapter 17 Marine Environment, paragraph 17.34.8, Environmental Statement, 2018).</p> <p>A United Utilities pumping station discharge (to Saltom Bay) is also outside the zone of influence for the WCM discharge (Chapter 17 Marine Environment, paragraph 17.34.7, Environmental Statement, 2018). The pumping station may only discharge to sea in emergency circumstances when the pumping station is inoperative. No discharge occurs under normal circumstances. Due to the operational restrictions on this outfall, a significant in-combination effect is not predicted (Chapter 17 Marine Environment, paragraph 17.34.9, Environmental Statement, 2018).</p> <p>The Sellafield outfalls extend ~2.1 km from shore into the north-eastern Irish Sea and are located approximately 14.5 km directly south of the Saltom Bay discharge point (~17 km by sea). The</p>		

River Derwent and Bassenthwaite Lake SAC – decommissioning phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>Sellafield discharge outfall (at Seascale) is therefore also outside the zone of influence for the WCM discharge (Chapter 17 Marine Environment, paragraph 17.34.7, Environmental Statement, 2018). An in-combination effect is not predicted to occur due to the separation distance (Chapter 17 Marine Environment, paragraph 17.34.11, Environmental Statement, 2018).</p> <p>The United Utilities wastewater treatment works discharge (at Parton, north of Whitehaven) is located approximately 5 km from the proposed discharge point in Saltom Bay. The discharge point of this outfall is therefore also outside the zone of influence for the WCM discharge (Chapter 17 Marine Environment, paragraph 17.34.7, Environmental Statement, 2018). Furthermore, the existing sewage discharge is discharged via diffuser(s) at a distance of ~1.9 km from shore, in the main current flows of the Solway Firth, and has an initial dilution factor of 50, which is generally considered appropriate for secondary treated sewage effluent. The United Utilities wastewater treatment works discharge is therefore considered to have sufficient initial and secondary mixing to ensure that it will not produce cumulative or in-combination impacts with the Saltom Bay discharge. (Chapter 17 Marine Environment, paragraph 17.34.10, Environmental Statement, 2018).</p> <p>There are no other projects which CCC is aware of in the marine environment in the proximity of the proposed mine that need to be included in an in-combination assessment. The NuGen Moorside development is currently on hold, and timescales, the nature and scope of the project, and its potential impacts are unknown. Therefore, no cumulative impact assessment is provided for this development.</p>		

River Derwent and Bassenthwaite Lake SAC – decommissioning phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>It is therefore concluded that the discharge will not have a significant effect on the marine environment, either alone or in combination with other discharges from other plans or projects; predicted effects during the decommissioning phase will be the same as or less than the predicted effects during the construction phase (Chapter 17 Marine Environment, Environmental Statement, sections 17.29.8 to 17.29.11, 17.33.7 and 17.34.7, West Cumbria Mining, 2018).</p> <p>It is concluded that there will be no adverse effect on the integrity of the SAC (through impacts on the populations of the SAC qualifying species or through impacts on supporting habitats or species) through this pathway alone or in combination with other plans or projects.</p>		
8	Deterioration of marine water quality as a result of sediment-laden surface water run-off via Pow Beck catchment	<p>Potential effect on qualifying features including impacts on prey availability and deterioration of food resource through:</p> <p>Escape of sediment-entrained surface water</p>	<p>The proposed development will not impact directly on any part of the SAC; however, impacts on marine water quality are possible as a result of discharges of surface water made from the RLF and Conveyor to the Bellhouse Gill and Pow Beck, which eventually discharges to the sea to the south of St Bees approximately 2.8 km downstream of the development.</p> <p>In the absence of mitigation the release of sediment-laden surface water via the Pow Beck into the marine environment could potentially impact on SAC qualifying features directly (if they are present in the vicinity of the Pow Beck where it discharges to sea at St Bees Beach), for example as a result of habitat deterioration due to sediment-laden water, or indirectly, by impacting on the prey species that SAC qualifying features depend upon.</p> <p>The effects of suspended solids (transported via the Pow Beck) on</p>	Yes	Yes

River Derwent and Bassenthwaite Lake SAC – decommissioning phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>the marine environment will be fully mitigated through measures that will be adopted during the decommissioning at the conveyor and rail loading facility sites (Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, sections 6.2 and 6.3, Flood Risk Assessment and Drainage Strategy, Environmental Statement, West Cumbria Mining, 2018; Sections 5.7 and 5.10 of the Draft Environmental Management Plan - Appendix E to Chapter 5 Project Description, Environmental Statement, West Cumbria Mining, 2018).</p> <p>Bellhouse Gill and an unnamed tributary of the Pow Beck (both ephemeral watercourses) are intersected by the conveyor route. The conveyor will be buried beneath these ephemeral watercourses and during the operation phase the flow regime at these locations will return to pre-development conditions and this is expected to continue during the decommissioning phase. There will therefore be no increases in flow rates or discharge volumes to Pow Beck during the operation phase and this is expected to continue during the decommissioning phase as well. The conveyor route will remain enclosed, which will minimise the chance of contamination of local watercourses during the decommissioning phase.</p> <p>After construction the conveyor box will be backfilled with low permeability material in a way that will minimise ingress and tracking of surface water along the outside of the box structure. At this point the difference between the flow regimes pre and post construction is expected to be negligible (Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, Flood Risk Assessment and Drainage Strategy, section 6.2.1.2, Environmental Statement, West Cumbria Mining, 2018). This situation is expected to continue during the decommissioning phase as the conveyor will be left in situ.</p>		

River Derwent and Bassenthwaite Lake SAC – decommissioning phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>During the decommissioning phase the storage lagoons, wetland, drainage pipes and outfalls to receiving watercourses that serve the RLF will remain.</p> <p>Once the mine is closed the above ground structures on the site will be removed and the land reinstated and planted for ecology and recreation. It is expected that the drainage infrastructure would remain in place and continue to function, although removing the buildings and ceasing operation would reduce the runoff and sediment generation from the site. If all the infrastructure is removed, including the drainage system, then the site would revert to its pre-development state. Discharge rates from the restored site will be reduced compared to the operational phase, as the impermeable surfaces will be removed and replaced by more retentive naturalised catchment.</p> <p>Dilution effects within Bellhouse Gill and Pow Beck will also reduce the environmental concentrations of any contaminants present (though this is considered unlikely once good practice measures are in place) to the point where they are not predicted to have any significant impact on the marine environment. Predicted effects during the decommissioning phase will be the same as or less than the predicted effects during the construction phase (Chapter 17 Marine Environment, paragraph 17.29.21 – 17.29.23, Environmental Statement, West Cumbria Mining, 2018).</p> <p>These good practice measures, in conjunction with mixing and dilution effects of the freshwater watercourses, mean that no significant pollution impact on the marine environment is predicted via</p>		

River Derwent and Bassenthwaite Lake SAC – decommissioning phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>the Pow Beck pathway (see Chapter 17, Marine Environment, paragraph 17.29.22, Environmental Statement, 2018), indeed any such impact is regarded as negligible. Consequently it is not expected that the discharge to Pow Beck will impact directly or indirectly on SAC populations of qualifying features or their supporting habitats or species.</p> <p>The hydrological assessment has concluded that, with respect to groundwater and surface water, no pathway is considered to exist between the proposed development and any other proposed development (Chapter 12 Hydrology & Hydrogeology, Section 12.8, Environmental Statement, West Cumbria Mining, 2018).</p> <p>As such an in-combination effect with other plans or projects is considered very unlikely, however, to ensure a comprehensive assessment, nearby licensable discharges to sea in the vicinity of the mouth of Pow Beck have nevertheless been investigated.</p> <p>The zone of influence (ZOI) of the proposed surface water runoff discharge to Saltom Bay has been calculated as approximately 162 m and is over 8 km (by sea) from the mouth of Pow Beck. Hence no in-combination effect is predicted between the two sources of surface water runoff associated with the proposed development.</p> <p>The closest licensed discharge to the mouth of Pow Beck is a United Utilities pumping station located at Nethertown, which has a permit to discharge to sea (permit no. 017470153) approximately 4 km south of the mouth of Pow Beck. However, under the conditions of the permit, the pumping station may only discharge to sea in emergency circumstances when the pumping station is inoperative as a result of</p>		

River Derwent and Bassenthwaite Lake SAC – decommissioning phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>e.g. electrical failure or rising main failure. No discharge occurs under normal circumstances. For this reason this discharge has been scoped out of the in-combination impact assessment.</p> <p>The United Utilities WwTW located at Braystones, south of Nethertown, discharges to sea via a long sea outfall (permit no. 017470152). The discharge point of this outfall is located approximately 7 km south from the mouth of Pow Beck and hence any combined effect between it and any discharges made via Pow Beck is very unlikely. Furthermore, the existing sewage discharge is discharged via diffuser(s) at a distance of ~2 km from shore and has an initial dilution factor generally considered appropriate for secondary treated sewage effluent. The existing discharge is therefore considered to have sufficient initial and secondary mixing to ensure that it will not produce cumulative or in-combination impacts with other discharges.</p> <p>The Sellafield outfalls extend ~2.1 km from shore into the north-eastern Irish Sea and are located approximately 8.8 km from the mouth of Pow Beck and hence, again, it is considered highly unlikely that the two plumes will interact. Furthermore, the two discharges are not similar; the proposed discharges to Pow Beck are ambient temperature freshwater which, with good practice guidelines in place, will not be contaminated, while the Sellafield discharge is a cooling water discharge, i.e. warm seawater. There is therefore no realistic likelihood of in-combination effects between the two discharges.</p> <p>There are no other projects which CCC is aware of in the marine environment in the proximity of the proposed mine that need to be included in an in-combination assessment. The NuGen Moorside</p>		

River Derwent and Bassenthwaite Lake SAC – decommissioning phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>development is currently on hold, and timescales, the nature and scope of the project, and its potential impacts are unknown. Therefore, no cumulative impact assessment is provided for this development.</p> <p>It is concluded that there will be no adverse effect on the integrity of the SAC (through impacts on the populations of the SAC qualifying species or through impacts on supporting habitats or species) through this pathway alone or in combination with other plans or projects.</p>		
9	<p>Deterioration of marine water quality as a result of disturbance of contaminated land and mobilisation of pollutants (including changes in pH, temperature, salinity, and dissolved oxygen) discharged via Pow Beck catchment</p>	<p>Potential effect on qualifying features including impacts on prey availability and deterioration of food resource through:</p> <p>Mobilisation of underground contaminants disturbed</p> <p>Potential for pollution incidents from spillages, leakages etc from stored chemicals, fuel and oils on site.</p>	<p>The proposed development will not impact directly on any part of the SAC; however, impacts on marine water quality are possible as a result of discharges of surface water made from the RLF and Conveyor to the Bellhouse Gill and Pow Beck, which eventually discharges to the sea to the south of St Bees approximately 2.8 km downstream of the development.</p> <p>In the absence of mitigation the release of pollutants into the marine environment could potentially impact on SAC qualifying features directly (if they are present in the vicinity of the Pow Beck where it discharges to sea), for example as a result of toxic effects, or indirectly, by impacting on the prey species that SAC qualifying features depend upon. There are also potential impacts associated with the discharge related to non-toxic inputs. These include the effects of pH, temperature, salinity and dissolved oxygen.</p> <p>During the decommissioning phase, pollution effects will be fully mitigated through the adoption of discharge and control measures at the conveyor and rail loading facility sites (Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, sections 6.2 and 6.3, Flood Risk</p>	Yes	Yes

River Derwent and Bassenthwaite Lake SAC – decommissioning phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>Assessment and Drainage Strategy, Environmental Statement, West Cumbria Mining, 2018; Sections 5.7 and 5.10 of the Draft Environmental Management Plan - Appendix E to Chapter 5 Project Description, Environmental Statement, West Cumbria Mining, 2018).</p> <p>Bellhouse Gill and an unnamed tributary of the Pow Beck (both ephemeral watercourses) are intersected by the conveyor route. The conveyor will be buried beneath these ephemeral watercourses and during the operation phase the flow regime at these locations will return to pre-development conditions and this is expected to continue during the decommissioning phase. There will therefore be no increases in flow rates or discharge volumes to Pow Beck during the operation phase and this is expected to continue during the decommissioning phase as well. The conveyor route will remain enclosed, which will minimise the chance of contamination of local watercourses during the decommissioning phase.</p> <p>During the decommissioning phase the storage lagoons, wetland, drainage pipes and outfalls to receiving watercourses that serve the RLF will remain.</p> <p>After construction the conveyor box will be backfilled with low permeability material in a way that will minimise ingress and tracking of surface water along the outside of the box structure. At this point the difference between the flow regimes pre and post construction is expected to be negligible (Chapter 12 Hydrology & Hydrogeology, Appendix 12.7, Flood Risk Assessment and Drainage Strategy, section 6.2.1.2, Environmental Statement, West Cumbria Mining, 2018). This situation is expected to continue during the decommissioning phase as the conveyor will be left in situ.</p>		

River Derwent and Bassenthwaite Lake SAC – decommissioning phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>Once the mine is closed the above ground structures on the site will be removed and the land reinstated and planted for ecology and recreation. It is expected that the drainage infrastructure would remain in place and continue to function, although removing the buildings and ceasing operation would reduce the runoff and sediment generation from the site. If all the infrastructure is removed, including the drainage system, then the site would revert to its pre-development state.</p> <p>Discharge rates from the restored site will be reduced compared to the operational phase, as the impermeable surfaces will be removed and replaced by more retentive naturalised catchment.</p> <p>Dilution effects within Bellhouse Gill and Pow Beck will also reduce the environmental concentrations of any contaminants present (though this is considered unlikely once good practice measures are in place) to the point where they are not predicted to have any significant impact on the marine environment. Predicted effects during the decommissioning phase will be the same as or less than the predicted effects during the construction phase (Chapter 17 Marine Environment, paragraph 17.29.21 – 17.29.23, Environmental Statement, West Cumbria Mining, 2018).</p> <p>The implementation of these good practice measures, in conjunction with mixing and dilution effects of the freshwater watercourses, mean that, no significant pollution impact on the marine environment is predicted via the Pow Beck pathway (see Chapter 17, Marine Environment, paragraph 17.29.22, Environmental Statement, 2018), indeed any such impact is regarded as negligible. Consequently it is</p>		

River Derwent and Bassenthwaite Lake SAC – decommissioning phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>not expected that the discharge of pollutants to Pow Beck (including changes in pH, temperature, salinity, and dissolved oxygen) will impact directly or indirectly on SAC populations of qualifying features or their supporting habitats or species.</p> <p>The hydrological assessment has concluded that, with respect to groundwater and surface water, no pathway is considered to exist between the proposed development and any other proposed development (Chapter 12 Hydrology & Hydrogeology, Section 12.8, Environmental Statement, West Cumbria Mining, 2018).</p> <p>As such an in-combination effect with other plans or projects is considered very unlikely, however, to ensure a comprehensive assessment, nearby licensable discharges to sea in the vicinity of the mouth of Pow Beck have nevertheless been investigated.</p> <p>The zone of influence (ZOI) of the proposed surface water runoff discharge to Saltom Bay has been calculated as approximately 162 m and is over 8 km (by sea) from the mouth of Pow Beck. Hence no in-combination effect is predicted between the two sources of surface water runoff associated with the proposed development.</p> <p>The closest licensed discharge to the mouth of Pow Beck is a United Utilities pumping station located at Nethertown, which has a permit to discharge to sea (permit no. 017470153) approximately 4 km south of the mouth of Pow Beck. However, under the conditions of the permit, the pumping station may only discharge to sea in emergency circumstances when the pumping station is inoperative as a result of e.g. electrical failure or rising main failure. No discharge occurs under normal circumstances. For this reason this discharge has been</p>		

River Derwent and Bassenthwaite Lake SAC – decommissioning phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>scoped out of the in-combination impact assessment.</p> <p>The United Utilities WwTW located at Braystones, south of Nethertown, discharges to sea via a long sea outfall (permit no. 017470152). The discharge point of this outfall is located approximately 7 km south from the mouth of Pow Beck and hence any combined effect between it and any discharges made via Pow Beck is very unlikely. Furthermore, the existing sewage discharge is discharged via diffuser(s) at a distance of ~2 km from shore and has an initial dilution factor generally considered appropriate for secondary treated sewage effluent. The existing discharge is therefore considered to have sufficient initial and secondary mixing to ensure that it will not produce cumulative or in-combination impacts with other discharges.</p> <p>The Sellafield outfalls extend ~2.1 km from shore into the north-eastern Irish Sea and are located approximately 8.8 km from the mouth of Pow Beck and hence, again, it is considered highly unlikely that the two plumes will interact. Furthermore, the two discharges are not similar; the proposed discharges to Pow Beck are ambient temperature freshwater which, with good practice guidelines in place, will not be contaminated, while the Sellafield discharge is a cooling water discharge, i.e. warm seawater. There is therefore no realistic likelihood of in-combination effects between the two discharges.</p> <p>There are no other projects which CCC is aware of in the marine environment in the proximity of the proposed mine that need to be included in an in-combination assessment. The NuGen Moorside development is currently on hold, and timescales, the nature and scope of the project, and its potential impacts are unknown.</p>		

River Derwent and Bassenthwaite Lake SAC – decommissioning phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			Therefore, no cumulative impact assessment is provided for this development. It is concluded that there will be no adverse effect on the integrity of the SAC (through impacts on the populations of the SAC qualifying species or through impacts on supporting habitats or species) through this pathway alone or in combination with other plans or projects.		
10	Subsidence effects under the terrestrial environment	Subsidence under the terrestrial environment as a result of sub-surface mining activities	No subsidence is predicted during the decommissioning phase as no mining activity will be taking place and any subsidence will have taken place during the operational phase of the development. Please see paragraphs 6.187 et seq in Chapter 6, which provides an assessment of the effects of subsidence.	Yes	Yes
11	Subsidence effects under the marine environment	Subsidence under the marine environment as a result of sub-surface mining activities	No subsidence is predicted during the decommissioning phase as no mining activity will be taking place and any subsidence will have taken place during the operational phase of the development. Please see paragraphs 6.187 et seq in Chapter 6, which provides an assessment of the effects of subsidence.	Yes	Yes

Lake District High Fells SAC

- 7.24 The qualifying features of the Lake District High Fells SAC are as follows:
- 7.25 Lake District High Fells is designated a SAC because it supports internationally important examples of the following Annex I habitats: oligotrophic to mesotrophic standing waters with vegetation of the *Littorelletea uniflorae* and/or of the *Isoëto-Nanojuncetea*; Northern Atlantic wet heaths with *Erica tetralix*; European dry heaths; Alpine and Boreal heaths; *Juniperus communis* formations on heaths or calcareous grasslands; siliceous alpine and boreal grasslands; hydrophilous tall herb fringe communities of plains and of the montane to alpine levels; blanket bogs; siliceous scree of the montane to snow levels (*Androsacetalia alpinae* and *Galeopsietalia ladani*); Siliceous rocky slopes with chasmophytic vegetation; old sessile oak woods with *Ilex* and *Blechnum* in the British Isles; species-rich *Nardus* grasslands, on silicious substrates in mountain areas (and submountain areas in Continental Europe); alkaline fens; and calcareous rocky slopes with chasmophytic vegetation
- 7.26 The Lake District High Fells SAC also supports the following Annex II species: Slender green feather-moss *Drepanocladus (Hamatocaulis) vernicosus*
- 7.27 The conservation objectives for the Lake District High Fells SAC are as follows:
- Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring;
 - The extent and distribution of qualifying natural habitats and habitats of qualifying species;
 - The structure and function (including typical species) of qualifying natural habitats;
 - The structure and function of the habitats of qualifying species;
 - The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely;
 - The populations of qualifying species; and
 - The distribution of qualifying species within the site.

Construction Phase

Table 11: Impact mechanisms and pathways during the construction phase of the development – Lake District High Fells SAC

Lake District High Fells SAC –construction phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
1	Direct loss of or damage to terrestrial habitat – MMS, RLF/UC	No impact pathway	Please see paragraphs 6.8 et seq in Chapter 6, which provide a detailed assessment.	Yes	Yes
2	Disturbance of marine or terrestrial qualifying species (visual/noise/vibration) – MMS/RLF/UC/UM)	No impact pathway	<p><u>Visual disturbance</u></p> <p>Please see paragraphs 6.27 et seq in Chapter 6, which provides a detailed assessment.</p> <p><u>Human presence</u></p> <p>Disturbance resulting from human presence is directly linked to visual disturbance, i.e. human presence may have an impact as a result of visual disturbance. Please see paragraphs 6.27 et seq in Chapter 6, which provides a detailed assessment.</p> <p><u>Noise and vibration</u></p> <p>Please see paragraphs 6.31 et seq in Chapter 6, which provides a detailed assessment.</p>	Yes	Yes
3	Direct loss of or damage to	No impact pathway	There is no mechanism whereby scouring and/or sedimentation from any discharges via the Saltom Bay outfall could impact on the	Yes	Yes

Lake District High Fells SAC –construction phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
	marine habitat or disturbance to marine species from scouring and/or sedimentation from any discharges via the Saltom Bay outfall		qualifying features of the SAC. Please see paragraphs 6.57 et seq in Chapter 6, which provides a detailed assessment.		
4	Direct loss of or damage to marine habitat or disturbance to marine species from scouring and/or sedimentation from any discharges via Pow Beck	No impact pathway	There is no mechanism whereby scouring and/or sedimentation from any discharges via the Pow Beck could impact on the qualifying features of the SAC. Please see paragraphs 6.57 et seq in Chapter 6, which provides a detailed assessment	Yes	Yes
5	Dust and other airborne contamination of marine and terrestrial	Potential toxic effect on qualifying features	Please see paragraphs 6.131 et seq in Chapter 6, which provide a detailed assessment of the effects of dust. Please see paragraphs 6.135 et seq in Chapter 6, which provide a detailed assessment of the effects of NOx.	Yes	Yes

Lake District High Fells SAC –construction phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
	habitats – MMS/RLF/UC		<p>Please see paragraphs 6.139 et seq in Chapter 6, which provide a detailed assessment of the effects of N deposition.</p> <p>This covers dust, traffic, and other operational controlled emissions and is explained in detail in the air quality assessment (Chapter 15 Air Quality, section 15.7, paragraph 15.7.1 - 15.7.4 [dust], paragraph 15.7.5 – 15.7.10 [traffic], paragraph 15.7.11 – 15.7.12 [controlled emissions], Environmental Statement, 2018)).</p>		
6	Deterioration of marine water quality as a result of sediment-laden surface water run-off via Saltom Bay outfall	No impact pathway	<p>There is no mechanism whereby any deterioration of marine water quality from any discharges via the Saltom Bay outfall could impact on the qualifying features of the SAC.</p> <p>Please see paragraphs 6.92 et seq in Chapter 6, which provides a detailed assessment</p>	Yes	Yes
7	Deterioration of marine water quality as a result of disturbance of contaminated land and mobilisation of pollutants (including	No impact pathway	<p>There is no mechanism whereby any deterioration of marine water quality from any discharges via the Saltom Bay outfall could impact on the qualifying features of the SAC.</p> <p>Please see paragraphs 6.92 et seq in Chapter 6, which provides a detailed assessment</p>	Yes	Yes

Lake District High Fells SAC –construction phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
	changes in pH, temperature, salinity, and dissolved oxygen) discharged via Saltom Bay outfall				
8	Deterioration of marine water quality as a result of sediment-laden surface water run-off via Pow Beck catchment	No impact pathway	There is no mechanism whereby any deterioration of marine water quality from any discharges via the Pow Beck could impact on the qualifying features of the SAC. Please see paragraphs 6.92 et seq in Chapter 6, which provides a detailed assessment	Yes	Yes
9	Deterioration of marine water quality as a result of disturbance of contaminated land and mobilisation of pollutants (including changes in pH, temperature,	No impact pathway	There is no mechanism whereby any deterioration of marine water quality from any discharges via the Pow Beck could impact on the qualifying features of the SAC. Please see paragraphs 6.92 et seq in Chapter 6, which provides a detailed assessment	Yes	Yes

Lake District High Fells SAC –construction phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
	salinity, and dissolved oxygen) discharged via Pow Beck catchment				
10	Subsidence effects under the terrestrial environment	No impact pathway	No subsidence is predicted during the construction phase as no mining activity will have commenced. Please see paragraphs 6.166 et seq in Chapter 6, which provides an assessment of the effects of subsidence.	Yes	Yes
11	Subsidence effects under the marine environment	No impact pathway	No subsidence is predicted during the construction phase as no mining activity will have commenced. Please see paragraphs 6.166 et seq in Chapter 6, which provides an assessment of the effects of subsidence.	Yes	Yes

Operation Phase

Table 12: Impact mechanisms and pathways during the operation phase of the development – Lake District High Fells SAC

Lake District High Fells SAC – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
1	Direct loss of or damage to terrestrial habitat – MMS, RLF/UC	No impact pathway	Please see paragraphs 6.19 et seq in Chapter 6, which provide a detailed assessment.	Yes	Yes
2	Disturbance of marine or terrestrial qualifying species (visual/noise/vibration) – MMS/RLF/UC/UM)	No impact pathway	<p><u>Visual disturbance</u></p> <p>Please see paragraphs 6.36 et seq in Chapter 6, which provides a detailed assessment.</p> <p><u>Human presence</u></p> <p>Disturbance resulting from human presence is directly linked to visual disturbance, i.e. human presence may have an impact as a result of visual disturbance. Please see paragraphs 6.36 et seq in Chapter 6, which provides a detailed assessment.</p> <p><u>Noise and vibration</u></p> <p>Please see paragraphs 6.40 et seq in Chapter 6, which provides a detailed assessment.</p>	Yes	Yes
3	Direct loss of	No impact pathway	There is no mechanism whereby scouring and/or sedimentation from	Yes	Yes

Lake District High Fells SAC – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
	or damage to marine habitat or disturbance to marine species from scouring and/or sedimentation from any discharges via the Saltom Bay outfall		any discharges via the Saltom Bay outfall could impact on the qualifying features of the SAC. Please see paragraphs 6.70 et seq in Chapter 6, which provides a detailed assessment.		
4	Direct loss of or damage to marine habitat or disturbance to marine species from scouring and/or sedimentation from any discharges via Pow Beck	No impact pathway	There is no mechanism whereby scouring and/or sedimentation from any discharges via the Pow Beck could impact on the qualifying features of the SAC. Please see paragraphs 6.70 et seq in Chapter 6, which provides a detailed assessment	Yes	Yes
5	Dust and other airborne	Potential toxic effect on qualifying features	Please see paragraphs 6.144 et seq in Chapter 6, which provide a detailed assessment of the effects of dust.	Yes	Yes

Lake District High Fells SAC – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
	contamination of marine and terrestrial habitats – MMS/RLF/UC		<p>Please see paragraphs 6.148 et seq in Chapter 6, which provide a detailed assessment of the effects of NOx.</p> <p>Please see paragraphs 6.152 et seq in Chapter 6, which provide a detailed assessment of the effects of N deposition.</p> <p>It is important to note that the analysis of air quality impacts presented in the above sections represents, as is legally required, a cumulative assessment of the proposed development (i.e. in combination with other plans and projects). This covers dust, traffic, and other operational controlled emissions and is explained in detail in the air quality assessment (Chapter 15 Air Quality, section 15.7, paragraph 15.7.1 - 15.7.4 [dust], paragraph 15.7.5 – 15.7.10 [traffic], paragraph 15.7.11 – 15.7.12 [controlled emissions], Environmental Statement, 2018).</p>		
6	Deterioration of marine water quality as a result of sediment-laden surface water run-off via Saltom Bay outfall	No impact pathway	<p>There is no mechanism whereby any deterioration of marine water quality from any discharges via the Saltom Bay outfall could impact on the qualifying features of the SAC.</p> <p>Please see paragraphs 6.104 et seq in Chapter 6, which provides a detailed assessment</p>	Yes	Yes
7	Deterioration of marine water quality	No impact pathway	<p>There is no mechanism whereby any deterioration of marine water quality from any discharges via the Saltom Bay outfall could impact on the qualifying features of the SAC.</p>	Yes	Yes

Lake District High Fells SAC – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
	as a result of disturbance of contaminated land and mobilisation of pollutants (including changes in pH, temperature, salinity, and dissolved oxygen) discharged via Saltom Bay outfall		Please see paragraphs 6.104 et seq in Chapter 6, which provides a detailed assessment		
8	Deterioration of marine water quality as a result of sediment-laden surface water run-off via Pow Beck catchment	No impact pathway	There is no mechanism whereby any deterioration of marine water quality from any discharges via the Pow Beck could impact on the qualifying features of the SAC. Please see paragraphs 6.104 et seq in Chapter 6, which provides a detailed assessment	Yes	Yes
9	Deterioration of marine water quality as a result of	No impact pathway	There is no mechanism whereby any deterioration of marine water quality from any discharges via the Pow Beck could impact on the qualifying features of the SAC.	Yes	Yes

Lake District High Fells SAC – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
	disturbance of contaminated land and mobilisation of pollutants (including changes in pH, temperature, salinity, and dissolved oxygen) discharged via Pow Beck catchment		Please see paragraphs 6.104 et seq in Chapter 6, which provides a detailed assessment		
10	Subsidence effects under the terrestrial environment	No impact pathway	No subsidence is predicted to impact on the SAC during the operation phase as any subsidence will only take place above the mining panels. The SAC is 10.18 km east of the main mine site. Please see paragraphs 6.168 et seq in Chapter 6, which provides an assessment of the effects of subsidence.	Yes	Yes
11	Subsidence effects under the marine environment	No impact pathway	No subsidence is predicted to impact on the SAC during the operation phase as any subsidence will only take place above the mining panels. The SAC is 10.18 km east of the main mine site. Please see paragraphs 6.168 et seq in Chapter 6, which provides an assessment of the effects of subsidence.	Yes	Yes

Decommissioning Phase

Table 13: Impact mechanisms and pathways during the decommissioning phase of the development – Lake District High Fells SAC

Lake District High Fells SAC – decommissioning phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
1	Direct loss of or damage to terrestrial habitat – MMS, RLF/UC	No impact pathway	Please see paragraphs 6.23 et seq in Chapter 6, which provide a detailed assessment.	Yes	Yes
2	Disturbance of marine or terrestrial qualifying species (visual/noise/vibration) – MMS/RLF/UC/UM)	No impact pathway	<p><u>Visual disturbance</u></p> <p>Please see paragraphs 6.46 et seq in Chapter 6, which provides a detailed assessment.</p> <p><u>Human presence</u></p> <p>Disturbance resulting from human presence is directly linked to visual disturbance, i.e. human presence may have an impact as a result of visual disturbance. Please see paragraphs 6.46 et seq in Chapter 6, which provides a detailed assessment.</p> <p><u>Noise and vibration</u></p> <p>Please see paragraphs 6.51 et seq in Chapter 6, which provides a detailed assessment.</p>	Yes	Yes
3	Direct loss of or damage to	No impact pathway	There is no mechanism whereby scouring and/or sedimentation from any discharges via the Saltom Bay outfall could impact on the	Yes	Yes

Lake District High Fells SAC – decommissioning phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
	marine habitat or disturbance to marine species from scouring and/or sedimentation from any discharges via the Saltom Bay outfall		qualifying features of the SAC. Please see paragraphs 6.83 et seq in Chapter 6, which provides a detailed assessment.		
4	Direct loss of or damage to marine habitat or disturbance to marine species from scouring and/or sedimentation from any discharges via Pow Beck	No impact pathway	There is no mechanism whereby scouring and/or sedimentation from any discharges via the Pow Beck could impact on the qualifying features of the SAC. Please see paragraphs 6.83 et seq in Chapter 6, which provides a detailed assessment	Yes	Yes
5	Dust and other airborne contamination of marine and terrestrial	Potential toxic effect on qualifying features	Please see paragraphs 6.157 et seq in Chapter 6, which provide a detailed assessment of the effects of dust. Please see paragraphs 6.161 et seq in Chapter 6, which provide a detailed assessment of the effects of NOx.	Yes	Yes

Lake District High Fells SAC – decommissioning phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
	habitats – MMS/RLF/UC		<p>Please see paragraphs 6.163 et seq in Chapter 6, which provide a detailed assessment of the effects of N deposition.</p> <p>It is important to note that the analysis of air quality impacts presented in the above sections represents, as is legally required, a cumulative assessment of the proposed development (i.e. in combination with other plans and projects). This covers dust, traffic, and other operational controlled emissions and is explained in detail in the air quality assessment (Chapter 15 Air Quality, section 15.7, paragraph 15.7.1 - 15.7.4 [dust], paragraph 15.7.5 – 15.7.10 [traffic], paragraph 15.7.11 – 15.7.12 [controlled emissions], Environmental Statement, 2018).</p>		
6	Deterioration of marine water quality as a result of sediment-laden surface water run-off from main mine site via the Saltom Bay outfall	No impact pathway	<p>There is no mechanism whereby any deterioration of marine water quality from any discharges via the Saltom Bay outfall could impact on the qualifying features of the SAC.</p> <p>Please see paragraphs 6.118 et seq in Chapter 6, which provides a detailed assessment</p>	Yes	Yes
7	Deterioration of marine water quality as a result of	No impact pathway	<p>There is no mechanism whereby any deterioration of marine water quality from any discharges via the Saltom Bay outfall could impact on the qualifying features of the SAC.</p>	Yes	Yes

Lake District High Fells SAC – decommissioning phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
	mobilisation of pollutants (including changes in pH, temperature, salinity, and dissolved oxygen) discharged via Saltom Bay outfall		Please see paragraphs 6.118 et seq in Chapter 6, which provides a detailed assessment		
8	Deterioration of marine water quality as a result of sediment-laden surface water run-off via Pow Beck catchment	No impact pathway	There is no mechanism whereby any deterioration of marine water quality from any discharges via the Pow Beck could impact on the qualifying features of the SAC. Please see paragraphs 6.118 et seq in Chapter 6, which provides a detailed assessment	Yes	Yes
9	Deterioration of marine water quality as a result of mobilisation of pollutants (including changes in pH,	No impact pathway	There is no mechanism whereby any deterioration of marine water quality from any discharges via the Pow Beck outfall could impact on the qualifying features of the SAC. Please see paragraphs 6.118 et seq in Chapter 6, which provides a detailed assessment	Yes	Yes

Lake District High Fells SAC – decommissioning phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
	temperature, salinity, and dissolved oxygen) discharged via Pow Beck catchment				
10	Subsidence effects under the terrestrial environment	No impact pathway	No subsidence is predicted during the decommissioning phase as no mining activity will be taking place and any subsidence will have taken place during the operational phase of the development. Please see paragraphs 6.187 et seq in Chapter 6, which provides an assessment of the effects of subsidence.	Yes	Yes
10	Subsidence effects under the marine environment	No impact pathway	No subsidence is predicted during the decommissioning phase as no mining activity will be taking place and any subsidence will have taken place during the operational phase of the development. Please see paragraphs 6.187 et seq in Chapter 6, which provides an assessment of the effects of subsidence.	Yes	Yes

Drigg Coast SAC

- 7.28 The qualifying features of the Drigg Coast SAC are as follows:
- 7.29 The Drigg Coast is designated a SAC because it supports internationally important examples of the following Annex I habitats, which are a primary reason for selection of this site: Estuaries; Atlantic decalcified fixed dunes (*Calluno-Ulicetea*); Dunes with *Salix repens* ssp. *argentea* (*Salicion arenariae*).
- 7.30 The site also supports the following Annex I habitats, which are not a primary reason for the selection of the site: Mudflats and sandflats not covered by seawater at low tide; *Salicornia* and other annuals colonizing mud and sand; Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*); Embryonic shifting dunes; Shifting dunes along the shoreline with *Ammophila arenaria* ("white dunes"); Fixed coastal dunes with herbaceous vegetation ("grey dunes"); Humid dune slacks.
- 7.31 The conservation objectives for the Drigg Coast SAC are as follows:
- Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring;
 - The extent and distribution of qualifying natural habitats and habitats of qualifying species;
 - The structure and function (including typical species) of qualifying natural habitats;
 - The structure and function of the habitats of qualifying species;
 - The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely;
 - The populations of qualifying species; and
 - The distribution of qualifying species within the site.

Construction Phase

Table 14: Impact mechanisms and pathways during the construction phase of the development – Drigg Coast SAC

Drigg Coast SAC – construction phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
1	Direct loss of or damage to terrestrial habitat – MMS, RLF/UC	No impact pathway	The interest features of the Drigg Coast SAC are coastal habitats that are located 14.45 km south-east of the main mine site, hence there is no impact pathway from loss of or damage to terrestrial habitat. Please see paragraphs 6.8 et seq in Chapter 6, which provide a detailed assessment.	Yes	Yes
2	Disturbance of marine or terrestrial qualifying species (visual/noise/vibration) – MMS/RLF/UC/UM/	No impact pathway	<u>Visual / human disturbance</u> The interest features of the Drigg Coast SAC are coastal habitats that are located 14.45 km south-east of the main mine site, hence this impact pathway has no relevance. Please see paragraphs 6.27 et seq in Chapter 6, which provides a detailed assessment. <u>Noise and vibration</u> The interest features of the Drigg Coast SAC are coastal habitats that are located 14.45 km south-east of the main mine site, hence this impact pathway has no relevance. Please see paragraphs 6.31 et seq in Chapter 6, which provides a detailed assessment.	Yes	Yes

Drigg Coast SAC – construction phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
3	Direct loss of or damage to marine habitat or disturbance to marine species from scouring and/or sedimentation from any discharges from the existing discharge pipe into Saltom Bay	No impact pathway	The proposed development will not impact directly or indirectly on any part of the Drigg Coast SAC. The interest features of the Drigg Coast SAC are coastal habitats that are located 14.45 km south-east of the main mine site and beyond any Zone of Influence (Chapter 17 Marine Environment, Environmental Statement, West Cumbria Mining, 2018, paragraphs 17.9.1 and 17.9.2), hence this impact pathway has no relevance. Please see paragraphs 6.57 et seq in Chapter 6, which provides a detailed assessment.	Yes	Yes
4	Direct loss of or damage to marine habitat or disturbance to marine species from scouring and/or sedimentation from any discharges via Pow Beck	No impact pathway	The proposed development will not impact directly on any part of the Drigg Coast SAC. The interest features of the Drigg Coast SAC are coastal habitats that are located c.12.8 km south-east of the Pow Beck and beyond any Zone of Influence (Chapter 17 Marine Environment, Environmental Statement, West Cumbria Mining, 2018, paragraphs 17.9.1 and 17.9.2), hence this impact pathway has no relevance. Please see paragraphs 6.57 et seq in Chapter 6, which provides a detailed assessment.	Yes	Yes
5	Dust and other airborne contamination of marine and terrestrial habitats – MMS/RLF/UC	Potential toxic effect on qualifying features	Please see paragraphs 6.131 et seq in Chapter 6, which provide a detailed assessment of the effects of dust. Please see paragraphs 6.135 et seq in Chapter 6, which provide a detailed assessment of the effects of NOx.	Yes	Yes

Drigg Coast SAC – construction phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>Please see paragraphs 6.139 et seq in Chapter 6, which provide a detailed assessment of the effects of N deposition.</p> <p>It is important to note that the analysis of air quality impacts presented in the above sections represents, as is legally required, a cumulative assessment of the proposed development (i.e. in combination with other plans and projects). This covers dust, traffic, and other operational controlled emissions and is explained in detail in the air quality assessment (Chapter 15 Air Quality, section 15.7, paragraph 15.7.1 - 15.7.4 [dust], paragraph 15.7.5 – 15.7.10 [traffic], paragraph 15.7.11 – 15.7.12 [controlled emissions], Environmental Statement, 2018)).</p>		
6	Deterioration of marine water quality as a result of sediment-laden surface water run-off during remediation and construction –via the Saltom Bay outfall	No impact pathway	<p>The proposed development will not impact directly or indirectly on any part of the Drigg Coast SAC. The interest features of the Drigg Coast SAC are coastal habitats that are located 14.45 km south-east of the main mine site and beyond any Zone of Influence (Chapter 17 Marine Environment, Environmental Statement, West Cumbria Mining, 2018, paragraphs 17.9.1 and 17.9.2), hence this impact pathway has no relevance..</p> <p>Please see paragraphs 6.92 et seq in Chapter 6, which provides a detailed assessment.</p>	Yes	Yes
7	Deterioration of marine water quality as a result of disturbance of	No impact pathway	<p>The proposed development will not impact directly or indirectly on any part of the Drigg Coast SAC. The interest features of the Drigg Coast SAC are coastal habitats that are located</p>	Yes	Yes

Drigg Coast SAC – construction phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
	contaminated land and mobilisation of pollutants during construction (including remediation works) on brownfield land (including changes in pH, temperature, salinity, and dissolved oxygen) discharged via Saltom Bay outfall		14.45 km south-east of the main mine site and beyond any Zone of Influence (Chapter 17 Marine Environment, Environmental Statement, West Cumbria Mining, 2018, paragraphs 17.9.1 and 17.9.2), hence this impact pathway has no relevance.. Please see paragraphs 6.92 et seq in Chapter 6, which provides a detailed assessment.		
8	Deterioration of marine water quality as a result of sediment-laden surface water run-off during construction, via Pow Beck catchment	No impact pathway	The proposed development will not impact directly on any part of the Drigg Coast SAC. The interest features of the Drigg Coast SAC are coastal habitats that are located c.12.8 km south-east of the Pow Beck and beyond any Zone of Influence (Chapter 17 Marine Environment, Environmental Statement, West Cumbria Mining, 2018, paragraphs 17.9.1 and 17.9.2), hence this impact pathway has no relevance. Please see paragraphs 6.92 et seq in Chapter 6, which provides a detailed assessment.	Yes	Yes
9	Deterioration of marine water quality as a result of disturbance of contaminated land and mobilisation of pollutants during construction (including remediation works) on brownfield	No impact pathway	The proposed development will not impact directly on any part of the Drigg Coast SAC. The interest features of the Drigg Coast SAC are coastal habitats that are located c.12.8 km south-east of the Pow Beck and beyond any Zone of Influence (Chapter 17 Marine Environment, Environmental Statement, West Cumbria Mining, 2018, paragraphs 17.9.1 and 17.9.2), hence this impact pathway has no relevance.	Yes	Yes

Drigg Coast SAC – construction phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
	land (including changes in pH, temperature, salinity, and dissolved oxygen) discharged via Pow Beck catchment		Please see paragraphs 6.92 et seq in Chapter 6, which provides a detailed assessment.		
10	Subsidence effects under the terrestrial environment	No impact pathway	No subsidence is expected during the construction phase as no mining activity will have commenced. Please see paragraphs 6.166 et seq in Chapter 6, which provides an assessment of the effects of subsidence.	Yes	Yes
11	Subsidence effects under the marine environment	No impact pathway	No subsidence is expected during the construction phase as no mining activity will have commenced. Please see paragraphs 6.166 et seq in Chapter 6, which provides an assessment of the effects of subsidence.	Yes	Yes

Operation Phase

Table 15: Impact mechanisms and pathways during the operation phase of the development – Drigg Coast SAC

Drigg Coast SAC – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
1	Direct loss of or damage to terrestrial habitat – MMS, RLF/UC	No impact pathway	<p>The interest features of the Drigg Coast SAC are coastal habitats that are located 14.45 km south-east of the main mine site, hence there is no impact pathway from loss of or damage to terrestrial habitat.</p> <p>Please see paragraphs 6.19 et seq in Chapter 6, which provide a detailed assessment.</p>	Yes	Yes
2	Disturbance of marine or terrestrial qualifying species (visual/noise/vibration) – MMS/RLF/UC/UM/	No impact pathway	<p><u>Visual / human disturbance</u></p> <p>The interest features of the Drigg Coast SAC are coastal habitats that are located 14.45 km south-east of the main mine site, hence this impact pathway has no relevance.</p> <p>Please see paragraphs 6.36 et seq in Chapter 6, which provides a detailed assessment.</p> <p><u>Noise and vibration</u></p> <p>The interest features of the Drigg Coast SAC are coastal habitats that are located 14.45 km south-east of the main mine site, hence this impact pathway has no relevance.</p> <p>Please see paragraphs 6.40 et seq in Chapter 6, which provides a detailed assessment.</p>	Yes	Yes

Drigg Coast SAC – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
3	Direct loss of or damage to marine habitat or disturbance to marine species from scouring and/or sedimentation from any discharges from the existing discharge pipe into Saltom Bay	No impact pathway	The proposed development will not impact directly or indirectly on any part of the Drigg Coast SAC. The interest features of the Drigg Coast SAC are coastal habitats that are located 14.45 km south-east of the main mine site and beyond any Zone of Influence (Chapter 17 Marine Environment, Environmental Statement, West Cumbria Mining, 2018, paragraphs 17.9.1 and 17.9.2), hence this impact pathway has no relevance. Please see paragraphs 6.70 et seq in Chapter 6, which provides a detailed assessment.	Yes	Yes
4	Direct loss of or damage to marine habitat or disturbance to marine species from scouring and/or sedimentation from any discharges via Pow Beck	No impact pathway	The proposed development will not impact directly on any part of the Drigg Coast SAC. The interest features of the Drigg Coast SAC are coastal habitats that are located c.12.8 km south-east of the Pow Beck and beyond any Zone of Influence (Chapter 17 Marine Environment, Environmental Statement, West Cumbria Mining, 2018, paragraphs 17.9.1 and 17.9.2), hence this impact pathway has no relevance. Please see paragraphs 6.70 et seq in Chapter 6, which provides a detailed assessment.	Yes	Yes
5	Dust and other airborne contamination of marine and terrestrial habitats	Potential toxic effect on qualifying features	Please see paragraphs 6.144 et seq in Chapter 6, which provide a detailed assessment of the effects of dust. Please see paragraphs 6.148 et seq in Chapter 6, which provide a detailed assessment of the effects of NOx.	Yes	Yes

Drigg Coast SAC – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
	– MMS/RLF/UC		<p>Please see paragraphs 6.152 et seq in Chapter 6, which provide a detailed assessment of the effects of N deposition.</p> <p>It is important to note that the analysis of air quality impacts presented in the above sections represents, as is legally required, a cumulative assessment of the proposed development (i.e. in combination with other plans and projects). This covers dust, traffic, and other operational controlled emissions and is explained in detail in the air quality assessment (Chapter 15 Air Quality, section 15.7, paragraph 15.7.1 - 15.7.4 [dust], paragraph 15.7.5 – 15.7.10 [traffic], paragraph 15.7.11 – 15.7.12 [controlled emissions], Environmental Statement, 2018)).</p>		
6	Deterioration of marine water quality as a result of sediment-laden surface water run-off during operation –via the Saltom Bay outfall	No impact pathway	<p>The proposed development will not impact directly or indirectly on any part of the Drigg Coast SAC. The interest features of the Drigg Coast SAC are coastal habitats that are located 14.45 km south-east of the main mine site and beyond any Zone of Influence (Chapter 17 Marine Environment, Environmental Statement, West Cumbria Mining, 2018, paragraphs 17.9.1 and 17.9.2), hence this impact pathway has no relevance..</p> <p>Please see paragraphs 6.104 et seq in Chapter 6, which provides a detailed assessment.</p>	Yes	Yes
7	Deterioration of marine water quality as a result of disturbance of contaminated land	No impact pathway	<p>The proposed development will not impact directly or indirectly on any part of the Drigg Coast SAC. The interest features of the Drigg Coast SAC are coastal habitats that are located 14.45 km south-east of the main mine site and beyond any Zone of Influence (Chapter 17 Marine Environment, Environmental</p>	Yes	Yes

Drigg Coast SAC – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
	and mobilisation of pollutants during operation on brownfield land (including changes in pH, temperature, salinity, and dissolved oxygen) discharged via Saltom Bay outfall		Statement, West Cumbria Mining, 2018, paragraphs 17.9.1 and 17.9.2), hence this impact pathway has no relevance. Please see paragraphs 6.104 et seq in Chapter 6, which provides a detailed assessment.		
8	Deterioration of marine water quality as a result of sediment-laden surface water run-off during operation, via Pow Beck catchment	No impact pathway	The proposed development will not impact directly on any part of the Drigg Coast SAC. The interest features of the Drigg Coast SAC are coastal habitats that are located c.12.8 km south-east of the Pow Beck and beyond any Zone of Influence (Chapter 17 Marine Environment, Environmental Statement, West Cumbria Mining, 2018, paragraphs 17.9.1 and 17.9.2), hence this impact pathway has no relevance. Please see paragraphs 6.104 et seq in Chapter 6, which provides a detailed assessment.	Yes	Yes
9	Deterioration of marine water quality as a result of disturbance of contaminated land and mobilisation of pollutants during operation on	No impact pathway	The proposed development will not impact directly on any part of the Drigg Coast SAC. The interest features of the Drigg Coast SAC are coastal habitats that are located c.12.8 km south-east of the Pow Beck and beyond any Zone of Influence (Chapter 17 Marine Environment, Environmental Statement, West Cumbria Mining, 2018, paragraphs 17.9.1 and 17.9.2), hence this impact pathway has no relevance.	Yes	Yes

Drigg Coast SAC – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
	brownfield land (including changes in pH, temperature, salinity, and dissolved oxygen) discharged via Pow Beck catchment		Please see paragraphs 6.104 et seq in Chapter 6, which provides a detailed assessment.		
10	Subsidence effects under the terrestrial environment	No impact pathway	<p>No subsidence is expected to impact on the SAC or its qualifying features during the operation phase as any subsidence will only take place above the mining panels. The SAC is 14.45 km south-east of the main mine site and beyond any Zone of Influence (Chapter 17 Marine Environment, Environmental Statement, West Cumbria Mining, 2018, paragraphs 17.9.1 and 17.9.2), hence this impact pathway has no relevance.</p> <p>Please see paragraphs 6.168 et seq in Chapter 6, which provides an assessment of the effects of subsidence.</p>	Yes	Yes
11	Subsidence effects under the marine environment	No impact pathway	<p>No subsidence is expected to impact on the SAC or its qualifying features during the operation phase as any subsidence will only take place above the mining panels. The SAC is 14.45 km south-east of the main mine site and beyond any Zone of Influence (Chapter 17 Marine Environment, Environmental Statement, West Cumbria Mining, 2018, paragraphs 17.9.1 and 17.9.2), hence this impact pathway has no relevance.</p> <p>Please see paragraphs 6.168 et seq in Chapter 6, which provides an assessment of the effects of subsidence.</p>	Yes	Yes

Decommissioning Phase

Table 16: Impact mechanisms and pathways during the decommissioning phase of the development – Drigg Coast SAC

Drigg Coast SAC – decommissioning phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
1	Direct loss of or damage to terrestrial habitat – MMS, RLF/UC	No impact pathway	The interest features of the Drigg Coast SAC are coastal habitats that are located 14.45 km south-east of the main mine site, hence there is no impact pathway from loss of or damage to terrestrial habitat. Please see paragraphs 6.23 et seq in Chapter 6, which provide a detailed assessment.	Yes	Yes
2	Disturbance of marine or terrestrial qualifying species (visual/noise/vibration) – MMS/RLF/UC/UM/	No impact pathway	<u>Visual / human disturbance</u> The interest features of the Drigg Coast SAC are coastal habitats that are located 14.45 km south-east of the main mine site, hence this impact pathway has no relevance. Please see paragraphs 6.46 et seq in Chapter 6, which provides a detailed assessment. <u>Noise and vibration</u> The interest features of the Drigg Coast SAC are coastal habitats that are located 14.45 km south-east of the main mine site, hence this impact pathway has no relevance. Please see paragraphs 6.51 et seq in Chapter 6, which provides a detailed assessment.	Yes	Yes

Drigg Coast SAC – decommissioning phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
3	Direct loss of or damage to marine habitat or disturbance to marine species from scouring and/or sedimentation from any discharges from the existing discharge pipe into Saltom Bay	No impact pathway	The proposed development will not impact directly or indirectly on any part of the Drigg Coast SAC. The interest features of the Drigg Coast SAC are coastal habitats that are located 14.45 km south-east of the main mine site and beyond any Zone of Influence (Chapter 17 Marine Environment, Environmental Statement, West Cumbria Mining, 2018, paragraphs 17.9.1 and 17.9.2), hence this impact pathway has no relevance. Please see paragraphs 6.83 et seq in Chapter 6, which provides a detailed assessment.	Yes	Yes
4	Direct loss of or damage to marine habitat or disturbance to marine species from scouring and/or sedimentation from any discharges via Pow Beck	No impact pathway	The proposed development will not impact directly on any part of the Drigg Coast SAC. The interest features of the Drigg Coast SAC are coastal habitats that are located c.12.8 km south-east of the Pow Beck and beyond any Zone of Influence (Chapter 17 Marine Environment, Environmental Statement, West Cumbria Mining, 2018, paragraphs 17.9.1 and 17.9.2), hence this impact pathway has no relevance. Please see paragraphs 6.83 et seq in Chapter 6, which provides a detailed assessment.	Yes	Yes
5	Dust and other airborne contamination of marine and terrestrial habitats – MMS/RLF/UC	No impact pathway	Please see paragraphs 6.157 et seq in Chapter 6, which provide a detailed assessment of the effects of dust. Please see paragraphs 6.161 et seq in Chapter 6, which provide a detailed assessment of the effects of NOx.	Yes	Yes

Drigg Coast SAC – decommissioning phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>Please see paragraphs 6.163 et seq in Chapter 6, which provide a detailed assessment of the effects of N deposition.</p> <p>It is important to note that the analysis of air quality impacts presented in the above sections represents, as is legally required, a cumulative assessment of the proposed development (i.e. in combination with other plans and projects). This covers dust, traffic, and other operational controlled emissions and is explained in detail in the air quality assessment (Chapter 15 Air Quality, section 15.7, paragraph 15.7.1 - 15.7.4 [dust], paragraph 15.7.5 – 15.7.10 [traffic], paragraph 15.7.11 – 15.7.12 [controlled emissions], Environmental Statement, 2018)).</p>		
6	Deterioration of marine water quality as a result of sediment-laden surface water run-off during decommissioning – via the Saltom Bay outfall	No impact pathway	<p>The proposed development will not impact directly or indirectly on any part of the Drigg Coast SAC. The interest features of the Drigg Coast SAC are coastal habitats that are located 14.45 km south-east of the main mine site and beyond any Zone of Influence (Chapter 17 Marine Environment, Environmental Statement, West Cumbria Mining, 2018, paragraphs 17.9.1 and 17.9.2), hence this impact pathway has no relevance..</p> <p>Please see paragraphs 6.118 et seq in Chapter 6, which provides a detailed assessment.</p>	Yes	Yes
7	Deterioration of marine water quality as a result of	No impact pathway	The proposed development will not impact directly or indirectly on any part of the Drigg Coast SAC. The interest features of the Drigg Coast SAC are coastal habitats that are located	Yes	Yes

Drigg Coast SAC – decommissioning phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
	disturbance of contaminated land and mobilisation of pollutants during decommissioning on brownfield land (including changes in pH, temperature, salinity, and dissolved oxygen) discharged via Saltom Bay outfall		14.45 km south-east of the main mine site and beyond any Zone of Influence (Chapter 17 Marine Environment, Environmental Statement, West Cumbria Mining, 2018, paragraphs 17.9.1 and 17.9.2), hence this impact pathway has no relevance.. Please see paragraphs 6.118 et seq in Chapter 6, which provides a detailed assessment.		
8	Deterioration of marine water quality as a result of sediment-laden surface water run-off during decommissioning, via Pow Beck catchment	No impact pathway	The proposed development will not impact directly on any part of the Drigg Coast SAC. The interest features of the Drigg Coast SAC are coastal habitats that are located c.12.8 km south-east of the Pow Beck and beyond any Zone of Influence (Chapter 17 Marine Environment, Environmental Statement, West Cumbria Mining, 2018, paragraphs 17.9.1 and 17.9.2), hence this impact pathway has no relevance. Please see paragraphs 6.118 et seq in Chapter 6, which provides a detailed assessment.	Yes	Yes
9	Deterioration of marine water quality as a result of disturbance of contaminated land and mobilisation of	No impact pathway	The proposed development will not impact directly on any part of the Drigg Coast SAC. The interest features of the Drigg Coast SAC are coastal habitats that are located c.12.8 km south-east of the Pow Beck and beyond any Zone of Influence (Chapter 17 Marine Environment, Environmental Statement, West Cumbria Mining, 2018, paragraphs 17.9.1 and 17.9.2),	Yes	Yes

Drigg Coast SAC – decommissioning phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
	pollutants during decommissioning on brownfield land (including changes in pH, temperature, salinity, and dissolved oxygen) discharged via Pow Beck catchment		hence this impact pathway has no relevance. Please see paragraphs 6.118 et seq in Chapter 6, which provides a detailed assessment.		
10	Subsidence effects under the terrestrial environment	No impact pathway	No subsidence is expected to impact on the SAC or its qualifying features during the decommissioning phase as all mining will have ceased. Any subsidence will have occurred above the mining panels and during the operational phase. The SAC is 14.45 km south-east of the main mine site and beyond any Zone of Influence (Chapter 17 Marine Environment, Environmental Statement, West Cumbria Mining, 2018, paragraphs 17.9.1 and 17.9.2), hence this impact pathway has no relevance. Please see paragraphs 6.187 et seq in Chapter 6, which provides an assessment of the effects of subsidence.	Yes	Yes
11	Subsidence effects under the marine environment	No impact pathway	No subsidence is expected to impact on the SAC or its qualifying features during the decommissioning phase as all mining will have ceased. Any subsidence will have occurred above the mining panels and during the operational phase. The SAC is 14.45 km south-east of the main mine site and beyond any Zone of Influence (Chapter 17 Marine Environment, Environmental Statement, West Cumbria Mining,	Yes	Yes

Drigg Coast SAC – decommissioning phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>2018, paragraphs 17.9.1 and 17.9.2), hence this impact pathway has no relevance.</p> <p>Please see paragraphs 6.187 et seq in Chapter 6, which provides an assessment of the effects of subsidence.</p>		

Morecambe Bay and Duddon Estuary SPA

- 7.32 The qualifying features of the Morecambe Bay and Duddon Estuary SPA are as follows:
- 7.33 The site qualifies under Article 4.1 of the Directive (2009/147/EC) as it is used regularly by 1% or more of the Great Britain populations of a number of waterbird species listed in Annex I. Over winter the site regularly supports: whooper swan *Cygnus Cygnus*; little egret *Egretta garzetta*; golden plover *Pluvialis apricaria*; ruff *Calidris pugnax*; bar-tailed godwit *Limosa lapponica*; and Mediterranean gull *Larus melancephalus*.
- 7.34 During the breeding season the site regularly supports: common tern *Sterna hirundo*; sandwich tern *Sterna sandvicensis*; and little tern *Sternula albifrons*.
- 7.35 The site also qualifies under Article 4.2 of the Directive (2009/147/EC) as it is used regularly birds on passage: pink-footed goose *Anser brachyrhynchus*; shelduck *Tadorna tadorna*; oystercatcher *Haematopus ostralegus*; ringed plover *Charadrius hiaticula*; red knot *Calidris canutus*; sanderling *Calidris alba*; dunlin *Calidris alpina alpina*; black-tailed godwit *Limosa limosa*; curlew *Numenius arquata*; pintail *Anas acuta*; turnstone *Arenaria interpres*; redshank *Tringa totanus*; and lesser black-backed gull *Larus fuscus*.
- 7.36 During the breeding season the site regularly supports: lesser black-backed gull *Larus fuscus*; and herring gull *Larus argentatus argentatus*.
- 7.37 The site also qualifies under Article 4.2 of the Directive (2009/147/EC) as it supports an internationally important assemblage of over 20,000 seabirds in any season, including: herring gull *Larus argentatus argentatus*, lesser black-backed gull *Larus fuscus*, sandwich tern *Sterna sandvicensis*, common tern *Sterna hirundo* and little tern *Sternula albifrons*.
- 7.38 The main components of the assemblage include all qualifying features listed above, as well as the following species present in numbers exceeding 1 % of the GB total population, and/or exceeding 2,000 individuals: great egret *Ardea alba*, Spoonbill *Platalea leucorodia*, brent goose *Branta bernicla*, wigeon *Anas penelope*, teal *Anas crecca*, green-winged teal *Anas carolinensis*, mallard *Anas platyrhynchos*, ring-necked duck *Aythya collaris*, common eider *Somateria mollissima*, goldeneye *Bucephala clangula*, red-breasted merganser *Mergus serrator*, cormorant *Phalacrocorax carbo*, lapwing *Vanellus vanellus*, little stint *Calidris minuta*, spotted redshank *Tringa erythropus*, greenshank *Tringa nebularia*, black-headed gull *Chroicocephalus ridibundus*, common gull *Larus canus* and herring gull *Larus argentatus argentatus* (non-breeding).
- 7.39 The conservation objectives for the Morecambe Bay and Duddon Estuary SPA are as follows:
- Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the aims of the Wild Birds Directive, by maintaining or restoring;
 - The extent and distribution of the habitats of the qualifying features;
 - The structure and function of the habitats of the qualifying features;
 - The supporting processes on which the habitats of the qualifying features rely;
 - The population of each of the qualifying features; and
 - The distribution of the qualifying features within the site.

Construction Phase

Table 17: Impact mechanisms and pathways during the construction phase of the development – Morecambe Bay and Duddon Estuary SPA

Morecambe Bay and Duddon Estuary SPA – construction phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
1	Direct loss of or damage to terrestrial habitat – MMS, RLF/UC	Potential loss of terrestrial supporting habitat for SPA birds through land-take	<p>The Morecambe Bay and Duddon Estuary SPA is located 17.07 km south-east of the main mine site, hence there is no impact pathway from loss of or damage to terrestrial habitat within the SPA. Please see paragraphs 6.8 et seq in Chapter 6, which provide a detailed assessment.</p> <p>Data collected through desk study complemented by survey data collected during various surveys carried out during the period 2015 to 2018 have led to the conclusion that no parts of the land at the site provide terrestrial supporting habitat for SPA birds (BSG Ecology, 2018 – paragraphs 2.3 and 2.6). No impacts on SPA birds are expected as there is no evidence that the land at the development site is functionally linked with the pSPA (i.e. it is not critical to or necessary for the ecological or behavioural functioning of the qualifying features for which a site has been designated).</p> <p>Surveys have also found that the site and adjacent marine area (which will only be affected by surface water drainage from the development site) is only used by small numbers of one SPA species, e.g. herring gull (BSG Ecology, 2018 – paragraphs 2.3 and 2.6). Whilst this species for which the SPA is qualified has been recorded, it was recorded outside the SPA boundary and may well not form part of the SPA population).</p>	Yes	Yes

Morecambe Bay and Duddon Estuary SPA – construction phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
2	Disturbance of marine or terrestrial qualifying species (visual/noise/vibration) – MMS/RLF/UC/UM/	Potential effect on SPA birds within surrounding functional habitat through impacts on prey availability.	<p><u>Visual / human disturbance</u></p> <p>The Morecambe Bay and Duddon Estuary SPA is located 17.07 km south-east of the main mine site, hence there is no impact pathway from visual / human disturbance for birds within the SPA. Please see paragraphs 6.27 et seq in Chapter 6, which provide a detailed assessment.</p> <p>Data collected through desk study complemented by survey data collected during various surveys carried out during the period 2015 to 2018 have led to the conclusion that no parts of the land at the site provide terrestrial supporting habitat for SPA birds (BSG Ecology, 2018 – paragraphs 2.3 and 2.6), hence this impact pathway has no relevance with regards to SPA birds using the proposed development site. Please see paragraphs 6.27 et seq in Chapter 6, which provides a detailed assessment.</p> <p><u>Noise and vibration</u></p> <p>The Morecambe Bay and Duddon Estuary SPA is located 17.07 km south-east of the main mine site, hence there is no impact pathway from noise / vibration disturbance for birds within the SPA. Please see paragraphs 6.31 et seq in Chapter 6, which provide a detailed assessment.</p> <p>Data collected through desk study complemented by survey data collected during various surveys carried out during the</p>	Yes	Yes

Morecambe Bay and Duddon Estuary SPA – construction phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			period 2015 to 2018 have led to the conclusion that no parts of the land at the site provide terrestrial supporting habitat for SPA birds (BSG Ecology, 2018 – paragraphs 2.3 and 2.6), hence this impact pathway has no relevance with regards to SPA birds using the proposed development site. Please see paragraphs 6.31 et seq in Chapter 6, which provides a detailed assessment.		
3	Direct loss of or damage to marine habitat or disturbance to marine species from scouring and/or sedimentation from any discharges from the existing discharge pipe into Saltom Bay	Potential effect on SPA birds both within SPA boundary and surrounding functional habitat through impacts on prey availability.	<p>The Morecambe Bay and Duddon Estuary SPA is located 17.07 km south-east of the main mine site, hence there is no impact pathway from scouring and/or sedimentation from any discharges from the existing discharge pipe into Saltom Bay for birds within the SPA. Please see paragraphs 6.57 et seq in Chapter 6, which provide a detailed assessment.</p> <p>Data collected through desk study complemented by survey data collected during various surveys carried out during the period 2015 to 2018 have led to the conclusion that no parts of the land at the development site provide terrestrial supporting habitat for SPA birds (BSG Ecology, 2018 – paragraphs 2.3 and 2.6), hence this impact pathway has no relevance with regards to SPA birds using the proposed development site.</p> <p>The SPA is 17.07 km south-east of the main mine site and beyond any Zone of Influence (Chapter 17 Marine Environment, Environmental Statement, West Cumbria Mining, 2018, paragraphs 17.9.1 and 17.9.2), hence this impact pathway has no relevance.</p>	Yes	Yes

Morecambe Bay and Duddon Estuary SPA – construction phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
4	Direct loss of or damage to marine habitat or disturbance to marine species from scouring and/or sedimentation from any discharges via Pow Beck	Potential effect on SPA birds both within SPA boundary and surrounding functional habitat through impacts on prey availability.	<p>The Morecambe Bay and Duddon Estuary SPA is located c.15.6 km south-east of the point where the Pow Beck discharges to sea, hence there is no impact pathway from scouring and/or sedimentation from any discharges via the Pow Beck for birds within the SPA. Please see paragraphs 6.57 et seq in Chapter 6, which provide a detailed assessment.</p> <p>Data collected through desk study complemented by survey data collected during various surveys carried out during the period 2015 to 2018 have led to the conclusion that no parts of the land at the development site provide terrestrial supporting habitat for SPA birds (BSG Ecology, 2018 – paragraphs 2.3 and 2.6), hence this impact pathway has no relevance with regards to SPA birds using the proposed development site.</p> <p>The SPA is c.15.6 km south-east of the point where the Pow Beck discharges to the sea and beyond any Zone of Influence (Chapter 17 Marine Environment, Environmental Statement, West Cumbria Mining, 2018, paragraphs 17.9.1 and 17.9.2), hence this impact pathway has no relevance.</p>	Yes	Yes
5	Dust and other airborne contamination of marine and terrestrial habitats – MMS/RLF/UC	Potential toxic effect on qualifying features	<p>Please see paragraphs 6.131 et seq in Chapter 6, which provide a detailed assessment of the effects of dust.</p> <p>Please see paragraphs 6.135 et seq in Chapter 6, which provide a detailed assessment of the effects of NOx.</p>	Yes	Yes

Morecambe Bay and Duddon Estuary SPA – construction phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>Please see paragraphs 6.139 et seq in Chapter 6, which provide a detailed assessment of the effects of N deposition.</p> <p>It is important to note that the analysis of air quality impacts presented in the above sections represents, as is legally required, a cumulative assessment of the proposed development (i.e. in combination with other plans and projects). This covers dust, traffic, and other operational controlled emissions and is explained in detail in the air quality assessment (Chapter 15 Air Quality, section 15.7, paragraph 15.7.1 - 15.7.4 [dust], paragraph 15.7.5 – 15.7.10 [traffic], paragraph 15.7.11 – 15.7.12 [controlled emissions], Environmental Statement, 2018)).</p>		
6	Deterioration of marine water quality as a result of sediment-laden surface water run-off during remediation and construction –via the Saltom Bay outfall	Potential effect on SPA birds within surrounding functional habitat through impacts on prey availability.	<p>The Morecambe Bay and Duddon Estuary SPA is located 17.07 km south-east of the main mine site, hence there is no impact pathway from sediment-laden surface water run-off from the existing discharge pipe into Saltom Bay for birds within the SPA. Please see paragraphs 6.92 et seq in Chapter 6, which provide a detailed assessment.</p> <p>Data collected through desk study complemented by survey data collected during various surveys carried out during the period 2015 to 2018 have led to the conclusion that no parts of the land at the development site provide terrestrial supporting habitat for SPA birds (BSG Ecology, 2018 – paragraphs 2.3 and 2.6), hence this impact pathway has no relevance with regards to SPA birds using the proposed</p>	Yes	Yes

Morecambe Bay and Duddon Estuary SPA – construction phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			development site. The SPA is 17.07 km south-east of the main mine site and beyond any Zone of Influence (Chapter 17 Marine Environment, Environmental Statement, West Cumbria Mining, 2018, paragraphs 17.9.1 and 17.9.2), hence this impact pathway has no relevance.		
7	Deterioration of marine water quality as a result of disturbance of contaminated land and mobilisation of pollutants during construction (including remediation works) on brownfield land (including changes in pH, temperature, salinity, and dissolved oxygen) discharged via Saltom Bay outfall	Potential effect on SPA birds both within SPA boundary and surrounding functional habitat through impacts on prey availability.	The Morecambe Bay and Duddon Estuary SPA is located 17.07 km south-east of the main mine site, hence there is no impact pathway from any deterioration of marine water quality arising from discharges from the existing discharge pipe into Saltom Bay for birds within the SPA. Please see paragraphs 6.92 et seq in Chapter 6, which provide a detailed assessment. Data collected through desk study complemented by survey data collected during various surveys carried out during the period 2015 to 2018 have led to the conclusion that no parts of the land at the development site provide terrestrial supporting habitat for SPA birds (BSG Ecology, 2018 – paragraphs 2.3 and 2.6), hence this impact pathway has no relevance with regards to SPA birds using the proposed development site. The SPA is 17.07 km south-east of the main mine site and beyond any Zone of Influence (Chapter 17 Marine Environment, Environmental Statement, West Cumbria Mining, 2018, paragraphs 17.9.1 and 17.9.2), hence this impact pathway has no relevance.	Yes	Yes

Morecambe Bay and Duddon Estuary SPA – construction phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
8	Deterioration of marine water quality as a result of sediment-laden surface water run-off during construction, via Pow Beck catchment	Potential effect on SPA birds both within SPA boundary and surrounding functional habitat through impacts on prey availability.	<p>The Morecambe Bay and Duddon Estuary SPA is located c.15.6 km south-east of the point where the Pow Beck discharges to sea, hence there is no impact pathway from sediment-laden surface water run-off from any discharges via the Pow Beck for birds within the SPA. Please see paragraphs 6.92 et seq in Chapter 6, which provide a detailed assessment.</p> <p>Data collected through desk study complemented by survey data collected during various surveys carried out during the period 2015 to 2018 have led to the conclusion that no parts of the land at the development site provide terrestrial supporting habitat for SPA birds (BSG Ecology, 2018 – paragraphs 2.3 and 2.6), hence this impact pathway has no relevance with regards to SPA birds using the proposed development site.</p> <p>The SPA is c.15.6 km south-east of the point where the Pow Beck discharges to the sea and beyond any Zone of Influence (Chapter 17 Marine Environment, Environmental Statement, West Cumbria Mining, 2018, paragraphs 17.9.1 and 17.9.2), hence this impact pathway has no relevance.</p>	Yes	Yes
9	Deterioration of marine water quality as a result of disturbance of contaminated land and mobilisation of	Potential effect on SPA birds both within SPA boundary and surrounding functional habitat through impacts on prey availability.	The Morecambe Bay and Duddon Estuary SPA is located c.15.6 km south-east of the point where the Pow Beck discharges to sea, hence there is no impact pathway from any deterioration of marine water quality arising from discharges from any discharges via the Pow Beck for birds within the SPA. Please see paragraphs 6.92 et seq in	Yes	Yes

Morecambe Bay and Duddon Estuary SPA – construction phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
	pollutants during construction (including remediation works) on brownfield land (including changes in pH, temperature, salinity, and dissolved oxygen) discharged via Pow Beck catchment		Chapter 6, which provide a detailed assessment. Data collected through desk study complemented by survey data collected during various surveys carried out during the period 2015 to 2018 have led to the conclusion that no parts of the land at the development site provide terrestrial supporting habitat for SPA birds (BSG Ecology, 2018 – paragraphs 2.3 and 2.6), hence this impact pathway has no relevance with regards to SPA birds using the proposed development site. The SPA is c.15.6 km south-east of the point where the Pow Beck discharges to the sea and beyond any Zone of Influence (Chapter 17 Marine Environment, Environmental Statement, West Cumbria Mining, 2018, paragraphs 17.9.1 and 17.9.2), hence this impact pathway has no relevance.		
10	Subsidence effects under the terrestrial environment	Subsidence under the terrestrial environment as a result of sub-surface mining activities	No subsidence is expected during the construction phase as no mining activity will have commenced. Please see paragraphs 6.166 et seq in Chapter 6, which provides an assessment of the effects of subsidence.	Yes	Yes
11	Subsidence effects under the marine environment	Subsidence under the marine environment as a result of sub-surface mining activities	No subsidence is expected during the construction phase as no mining activity will have commenced. Please see paragraphs 6.166 et seq in Chapter 6, which provides an assessment of the effects of subsidence.	Yes	Yes

Operation Phase

Table 18: Impact mechanisms and pathways during the operation phase of the development – Morecambe Bay and Duddon Estuary SPA

Morecambe Bay and Duddon Estuary SPA – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
1	Direct loss of or damage to terrestrial habitat – MMS, RLF/UC	Potential loss of terrestrial supporting habitat for SPA birds through land-take	<p>The Morecambe Bay and Duddon Estuary SPA is located 17.07 km south-east of the main mine site, hence there is no impact pathway from loss of or damage to terrestrial habitat within the SPA. Please see paragraphs 6.19 et seq in Chapter 6, which provide a detailed assessment.</p> <p>Data collected through desk study complemented by survey data collected during various surveys carried out during the period 2015 to 2018 have led to the conclusion that no parts of the land at the site provide terrestrial supporting habitat for SPA birds (BSG Ecology, 2018 – paragraphs 2.3 and 2.6). No impacts on SPA birds are expected as there is no evidence that the land at the development site is functionally linked with the pSPA (i.e. it is not critical to or necessary for the ecological or behavioural functioning of the qualifying features for which a site has been designated).</p> <p>Surveys have also found that the site and adjacent marine area (which will only be affected by surface water drainage from the development site) is only used by small numbers of one SPA species, e.g. herring gull (BSG Ecology, 2018 – paragraphs 2.3 and 2.6). Whilst this species for which the SPA is qualified has been recorded, it was recorded outside the SPA boundary and may well not form part of the SPA population).</p>	Yes	Yes

Morecambe Bay and Duddon Estuary SPA – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
2	Disturbance of marine or terrestrial qualifying species (visual/noise/vibration) – MMS/RLF/UC/UM/	<p>Potential effect on SPA birds within the surrounding functional habitat through:</p> <p>Visual disturbance</p> <p>Human presence</p> <p>Noise</p> <p>Vibration</p>	<p><u>Visual / human disturbance</u></p> <p>The Morecambe Bay and Duddon Estuary SPA is located 17.07 km south-east of the main mine site, hence there is no impact pathway from visual / human disturbance for birds using the SPA. Please see paragraphs 6.36 et seq in Chapter 6, which provide a detailed assessment.</p> <p>Data collected through desk study complemented by survey data collected during various surveys carried out during the period 2015 to 2018 have led to the conclusion that no parts of the land at the site provide terrestrial supporting habitat for SPA birds (BSG Ecology, 2018 – paragraphs 2.3 and 2.6). No impacts on SPA birds are expected as there is no evidence that the land at the development site is functionally linked with the SPA (i.e. it is not critical to or necessary for the ecological or behavioural functioning of the qualifying features for which a site has been designated).</p> <p>Surveys have also found that the site and adjacent marine area (which will only be affected by surface water drainage from the development site) is only used by small numbers of one SPA species, e.g. herring gull (BSG Ecology, 2018 – paragraphs 2.3 and 2.6). Whilst this species for which the SPA is qualified has been recorded, it was recorded outside the SPA boundary and may well not form part of the SPA population)</p> <p><u>Noise and vibration</u></p>	Yes	Yes

Morecambe Bay and Duddon Estuary SPA – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>The Morecambe Bay and Duddon Estuary SPA is located 17.07 km south-east of the main mine site, hence there is no impact pathway from noise / vibration disturbance for birds using the SPA. Please see paragraphs 6.40 et seq in Chapter 6, which provide a detailed assessment.</p> <p>Data collected through desk study complemented by survey data collected during various surveys carried out during the period 2015 to 2018 have led to the conclusion that no parts of the land at the site provide terrestrial supporting habitat for SPA birds (BSG Ecology, 2018 – paragraphs 2.3 and 2.6). No impacts on SPA birds are expected as there is no evidence that the land at the development site is functionally linked with the SPA (i.e. it is not critical to or necessary for the ecological or behavioural functioning of the qualifying features for which a site has been designated).</p> <p>Surveys have also found that the site and adjacent marine area (which will only be affected by surface water drainage from the development site) is only used by small numbers of one SPA species, e.g. herring gull (BSG Ecology, 2018 – paragraphs 2.3 and 2.6). Whilst this species for which the SPA is qualified has been recorded, it was recorded outside the SPA boundary and may well not form part of the SPA population).</p>		
3	Direct loss of or damage to marine habitat or disturbance to	Potential effect on SPA birds within surrounding functional habitat	The Morecambe Bay and Duddon Estuary SPA is located 17.07 km south-east of the main mine site, hence there is no impact pathway from scouring and/or sedimentation from any discharges from the existing discharge pipe into Saltom Bay for	Yes	Yes

Morecambe Bay and Duddon Estuary SPA – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
	marine species from scouring and/or sedimentation from any discharges from the existing discharge pipe into Saltom Bay	through impacts on prey availability	<p>birds within the SPA. Please see paragraphs 6.70 et seq in Chapter 6, which provide a detailed assessment.</p> <p>Data collected through desk study complemented by survey data collected during various surveys carried out during the period 2015 to 2018 have led to the conclusion that no parts of the land at the development site provide terrestrial supporting habitat for SPA birds (BSG Ecology, 2018 – paragraphs 2.3 and 2.6), hence this impact pathway has no relevance with regards to SPA birds using the proposed development site.</p> <p>The SPA is 17.07 km south-east of the main mine site and beyond any Zone of Influence (Chapter 17 Marine Environment, Environmental Statement, West Cumbria Mining, 2018, paragraphs 17.9.1 and 17.9.2), hence this impact pathway has no relevance.</p>		
4	Direct loss of or damage to marine habitat or disturbance to marine species from scouring and/or sedimentation from any discharges via Pow Beck	Potential effect on SPA birds within surrounding functional habitat through impacts on prey availability	<p>The Morecambe Bay and Duddon Estuary SPA is located c.15.6 km south-east of the point where the Pow Beck discharges to sea, hence there is no impact pathway from scouring and/or sedimentation from any discharges via the Pow Beck for birds within the SPA. Please see paragraphs 6.70 et seq in Chapter 6, which provide a detailed assessment.</p> <p>Data collected through desk study complemented by survey data collected during various surveys carried out during the period 2015 to 2018 have led to the conclusion that no parts of the land at the development site provide terrestrial supporting habitat for SPA birds (BSG Ecology, 2018 – paragraphs 2.3 and 2.6), hence this impact pathway has no relevance with regards to</p>	Yes	Yes

Morecambe Bay and Duddon Estuary SPA – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>SPA birds using the proposed development site.</p> <p>The SPA is c.15.6 km south-east of the point where the Pow Beck discharges to the sea and beyond any Zone of Influence (Chapter 17 Marine Environment, Environmental Statement, West Cumbria Mining, 2018, paragraphs 17.9.1 and 17.9.2), hence this impact pathway has no relevance.</p>		
5	Dust and other airborne contamination of marine and terrestrial habitats – MMS/RLF/UC	Potential toxic effect on qualifying features	<p>Please see paragraphs 6.144 et seq in Chapter 6, which provide a detailed assessment of the effects of dust.</p> <p>Please see paragraphs 6.148 et seq in Chapter 6, which provide a detailed assessment of the effects of NOx.</p> <p>Please see paragraphs 6.152 et seq in Chapter 6, which provide a detailed assessment of the effects of N deposition.</p> <p>It is important to note that the analysis of air quality impacts presented in the above sections represents, as is legally required, a cumulative assessment of the proposed development (i.e. in combination with other plans and projects). This covers dust, traffic, and other operational controlled emissions and is explained in detail in the air quality assessment (Chapter 15 Air Quality, section 15.7, paragraph 15.7.1 - 15.7.4 [dust], paragraph 15.7.5 – 15.7.10 [traffic], paragraph 15.7.11 – 15.7.12 [controlled emissions], Environmental Statement, 2018)).</p>	Yes	Yes
6	Deterioration of marine water quality	Potential effect on SPA birds within	The Morecambe Bay and Duddon Estuary SPA is located 17.07 km south-east of the main mine site, hence there is no impact	Yes	Yes

Morecambe Bay and Duddon Estuary SPA – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
	as a result of sediment-laden surface water run-off during operation –via the Saltom Bay outfall	surrounding functional habitat through impacts on prey availability.	<p>pathway from sediment-laden surface water run-off from the existing discharge pipe into Saltom Bay for birds within the SPA. Please see paragraphs 6.104 et seq in Chapter 6, which provide a detailed assessment.</p> <p>Data collected through desk study complemented by survey data collected during various surveys carried out during the period 2015 to 2018 have led to the conclusion that no parts of the land at the development site provide terrestrial supporting habitat for SPA birds (BSG Ecology, 2018 – paragraphs 2.3 and 2.6), hence this impact pathway has no relevance with regards to SPA birds using the proposed development site.</p> <p>The SPA is 17.07 km south-east of the main mine site and beyond any Zone of Influence (Chapter 17 Marine Environment, Environmental Statement, West Cumbria Mining, 2018, paragraphs 17.9.1 and 17.9.2), hence this impact pathway has no relevance.</p>		
7	Deterioration of marine water quality as a result of disturbance of contaminated land and mobilisation of pollutants during operation on brownfield land (including changes in pH, temperature, salinity, and	Potential effect on SPA birds within surrounding functional habitat through impacts on prey availability.	<p>The Morecambe Bay and Duddon Estuary SPA is located 17.07 km south-east of the main mine site, hence there is no impact pathway from any deterioration of marine water quality arising from discharges from the existing discharge pipe into Saltom Bay for birds within the SPA. Please see paragraphs 6.104 et seq in Chapter 6, which provide a detailed assessment.</p> <p>Data collected through desk study complemented by survey data collected during various surveys carried out during the period 2015 to 2018 have led to the conclusion that no parts of the land at the development site provide terrestrial supporting habitat for</p>	Yes	Yes

Morecambe Bay and Duddon Estuary SPA – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
	dissolved oxygen) discharged via Saltom Bay outfall		<p>SPA birds (BSG Ecology, 2018 – paragraphs 2.3 and 2.6), hence this impact pathway has no relevance with regards to SPA birds using the proposed development site.</p> <p>The SPA is 17.07 km south-east of the main mine site and beyond any Zone of Influence (Chapter 17 Marine Environment, Environmental Statement, West Cumbria Mining, 2018, paragraphs 17.9.1 and 17.9.2), hence this impact pathway has no relevance.</p>		
8	Deterioration of marine water quality as a result of sediment-laden surface water run-off during operation, via Pow Beck catchment	Potential effect on SPA birds within surrounding functional habitat through impacts on prey availability	<p>The Morecambe Bay and Duddon Estuary SPA is located c.15.6 km south-east of the point where the Pow Beck discharges to sea, hence there is no impact pathway from sediment-laden surface water run off via the Pow Beck for birds within the SPA. Please see paragraphs 6.104 et seq in Chapter 6, which provide a detailed assessment.</p> <p>Data collected through desk study complemented by survey data collected during various surveys carried out during the period 2015 to 2018 have led to the conclusion that no parts of the land at the development site provide terrestrial supporting habitat for SPA birds (BSG Ecology, 2018 – paragraphs 2.3 and 2.6), hence this impact pathway has no relevance with regards to SPA birds using the proposed development site.</p> <p>The SPA is c.15.6 km south-east of the point where the Pow Beck discharges to the sea and beyond any Zone of Influence (Chapter 17 Marine Environment, Environmental Statement, West Cumbria Mining, 2018, paragraphs 17.9.1 and 17.9.2), hence this impact pathway has no relevance.</p>	Yes	Yes

Morecambe Bay and Duddon Estuary SPA – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
9	Deterioration of marine water quality as a result of disturbance of contaminated land and mobilisation of pollutants during operation on brownfield land (including changes in pH, temperature, salinity, and dissolved oxygen) discharged via Pow Beck catchment	Potential effect on SPA birds within surrounding functional habitat through impacts on prey availability	<p>The Morecambe Bay and Duddon Estuary SPA is located c.15.6 km south-east of the point where the Pow Beck discharges to sea, hence there is no impact pathway from any deterioration of marine water quality arising from discharges via the Pow Beck for birds within the SPA. Please see paragraphs 6.104 et seq in Chapter 6, which provide a detailed assessment.</p> <p>Data collected through desk study complemented by survey data collected during various surveys carried out during the period 2015 to 2018 have led to the conclusion that no parts of the land at the development site provide terrestrial supporting habitat for SPA birds (BSG Ecology, 2018 – paragraphs 2.3 and 2.6), hence this impact pathway has no relevance with regards to SPA birds using the proposed development site.</p> <p>The SPA is c.15.6 km south-east of the point where the Pow Beck discharges to the sea and beyond any Zone of Influence (Chapter 17 Marine Environment, Environmental Statement, West Cumbria Mining, 2018, paragraphs 17.9.1 and 17.9.2), hence this impact pathway has no relevance.</p>	Yes	Yes
10	Subsidence effects under the terrestrial environment	Subsidence under the terrestrial environment as a result of sub-surface mining activities	No subsidence is expected to impact on the SPA or its qualifying features during the operation phase as any subsidence will only take place above the mining panels. The SPA is 17.07 km south-east of the main mine site and beyond any Zone of Influence (Chapter 17 Marine Environment, Environmental Statement, West Cumbria Mining, 2018, paragraphs 17.9.1 and 17.9.2), hence this impact pathway has no relevance.	Yes	Yes

Morecambe Bay and Duddon Estuary SPA – operation phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			Please see paragraphs 6.168 et seq in Chapter 6, which provides an assessment of the effects of subsidence.		
11	Subsidence effects under the marine environment	Subsidence under the marine environment as a result of sub-surface mining activities	<p>No subsidence is expected to impact on the SPA or its qualifying features during the operation phase as any subsidence will only take place above the mining panels. The SPA is 17.07 km south-east of the main mine site and beyond any Zone of Influence (Chapter 17 Marine Environment, Environmental Statement, West Cumbria Mining, 2018, paragraphs 17.9.1 and 17.9.2), hence this impact pathway has no relevance.</p> <p>Please see paragraphs 6.168 et seq in Chapter 6, which provides an assessment of the effects of subsidence.</p>	Yes	Yes

Decommissioning Phase

Table 19: Impact mechanisms and pathways during the decommissioning phase of the development – Morecambe Bay and Duddon Estuary SPA

Morecambe Bay and Duddon Estuary SPA – decommissioning phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
1	Direct loss of or damage to terrestrial habitat – MMS, RLF/UC	Potential loss of terrestrial supporting habitat for SPA birds through land-take	<p>The Morecambe Bay and Duddon Estuary SPA is located 17.07 km south-east of the main mine site, hence there is no impact pathway from loss of or damage to terrestrial habitat within the SPA. Please see paragraphs 6.23 et seq in Chapter 6, which provide a detailed assessment.</p> <p>Data collected through desk study complemented by survey data collected during various surveys carried out during the period 2015 to 2018 have led to the conclusion that no parts of the land at the site provide terrestrial supporting habitat for SPA birds (BSG Ecology, 2018 – paragraphs 2.3 and 2.6). No impacts on SPA birds are expected as there is no evidence that the land at the development site is functionally linked with the SPA (i.e. it is not critical to or necessary for the ecological or behavioural functioning of the qualifying features for which a site has been designated).</p> <p>Surveys have also found that the site and adjacent marine area (which will only be affected by surface water drainage from the development site) is only used by small numbers of one SPA species, e.g. herring gull (BSG Ecology, 2018 – paragraphs 2.3 and 2.6). Whilst this species for which the SPA is qualified has been recorded, it was recorded outside the SPA boundary and may well not form part of the SPA population).</p>	Yes	Yes

Morecambe Bay and Duddon Estuary SPA – decommissioning phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
2	Disturbance of marine or terrestrial qualifying species (visual/noise/vibration) – MMS/RLF/UC/UM/	Potential effect on SPA birds within surrounding functional habitat through impacts on prey availability.	<p><u>Visual / human disturbance</u></p> <p>The Morecambe Bay and Duddon Estuary SPA is located 17.07 km south-east of the main mine site, hence there is no impact pathway from visual / human disturbance for birds within the SPA. Please see paragraphs 6.46 et seq in Chapter 6, which provide a detailed assessment.</p> <p>Data collected through desk study complemented by survey data collected during various surveys carried out during the period 2015 to 2018 have led to the conclusion that no parts of the land at the site provide terrestrial supporting habitat for SPA birds (BSG Ecology, 2018 – paragraphs 2.3 and 2.6), hence this impact pathway has no relevance with regards to SPA birds using the proposed development site. Please see paragraphs 6.46 et seq in Chapter 6, which provides a detailed assessment.</p> <p><u>Noise and vibration</u></p> <p>The Morecambe Bay and Duddon Estuary SPA is located 17.07 km south-east of the main mine site, hence there is no impact pathway from noise / vibration disturbance for birds within the SPA. Please see paragraphs 6.51 et seq in Chapter 6, which provide a detailed assessment.</p> <p>Data collected through desk study complemented by survey data collected during various surveys carried out during the</p>	Yes	Yes

Morecambe Bay and Duddon Estuary SPA – decommissioning phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			period 2015 to 2018 have led to the conclusion that no parts of the land at the site provide terrestrial supporting habitat for SPA birds (BSG Ecology, 2018 – paragraphs 2.3 and 2.6), hence this impact pathway has no relevance with regards to SPA birds using the proposed development site. Please see paragraphs 6.51 et seq in Chapter 6, which provides a detailed assessment.		
3	Direct loss of or damage to marine habitat or disturbance to marine species from scouring and/or sedimentation from any discharges from the existing discharge pipe into Saltom Bay	Potential effect on SPA birds within surrounding functional habitat through impacts on prey availability.	<p>The Morecambe Bay and Duddon Estuary SPA is located 17.07 km south-east of the main mine site, hence there is no impact pathway from scouring and/or sedimentation from any discharges from the existing discharge pipe into Saltom Bay for birds within the SPA. Please see paragraphs 6.83 et seq in Chapter 6, which provide a detailed assessment.</p> <p>Data collected through desk study complemented by survey data collected during various surveys carried out during the period 2015 to 2018 have led to the conclusion that no parts of the land at the development site provide terrestrial supporting habitat for SPA birds (BSG Ecology, 2018 – paragraphs 2.3 and 2.6), hence this impact pathway has no relevance with regards to SPA birds using the proposed development site.</p> <p>The SPA is 17.07 km south-east of the main mine site and beyond any Zone of Influence (Chapter 17 Marine Environment, Environmental Statement, West Cumbria Mining, 2018, paragraphs 17.9.1 and 17.9.2), hence this impact pathway has no relevance.</p>	Yes	Yes

Morecambe Bay and Duddon Estuary SPA – decommissioning phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
4	Direct loss of or damage to marine habitat or disturbance to marine species from scouring and/or sedimentation from any discharges via Pow Beck	Potential effect on SPA birds within surrounding functional habitat through impacts on prey availability	<p>The Morecambe Bay and Duddon Estuary SPA is located c.15.6 km south-east of the point where the Pow Beck discharges to sea, hence there is no impact pathway from scouring and/or sedimentation from any discharges via the Pow Beck for birds within the SPA. Please see paragraphs 6.83 et seq in Chapter 6, which provide a detailed assessment.</p> <p>Data collected through desk study complemented by survey data collected during various surveys carried out during the period 2015 to 2018 have led to the conclusion that no parts of the land at the development site provide terrestrial supporting habitat for SPA birds (BSG Ecology, 2018 – paragraphs 2.3 and 2.6), hence this impact pathway has no relevance with regards to SPA birds using the proposed development site.</p> <p>The SPA is c.15.6 km south-east of the point where the Pow Beck discharges to the sea and beyond any Zone of Influence (Chapter 17 Marine Environment, Environmental Statement, West Cumbria Mining, 2018, paragraphs 17.9.1 and 17.9.2), hence this impact pathway has no relevance.</p>	Yes	Yes
5	Dust and other airborne contamination of marine and terrestrial	Potential toxic effect on qualifying features	Please see paragraphs 6.157 et seq in Chapter 6, which provide a detailed assessment of the effects of dust.	Yes	Yes

Morecambe Bay and Duddon Estuary SPA – decommissioning phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
	habitats – MMS/RLF/UC		<p>Please see paragraphs 6.161 et seq in Chapter 6, which provide a detailed assessment of the effects of NOx.</p> <p>Please see paragraphs 6.163 et seq in Chapter 6, which provide a detailed assessment of the effects of N deposition.</p> <p>It is important to note that the analysis of air quality impacts presented in the above sections represents, as is legally required, a cumulative assessment of the proposed development (i.e. in combination with other plans and projects). This covers dust, traffic, and other operational controlled emissions and is explained in detail in the air quality assessment (Chapter 15 Air Quality, section 15.7, paragraph 15.7.1 - 15.7.4 [dust], paragraph 15.7.5 – 15.7.10 [traffic], paragraph 15.7.11 – 15.7.12 [controlled emissions], Environmental Statement, 2018)).</p>		
6	Deterioration of marine water quality as a result of sediment-laden surface water run-off during decommissioning – via the Saltom Bay outfall	Potential effect on SPA birds within surrounding functional habitat through impacts on prey availability.	<p>The Morecambe Bay and Duddon Estuary SPA is located 17.07 km south-east of the main mine site, hence there is no impact pathway from sediment-laden surface water run-off from the existing discharge pipe into Saltom Bay for birds within the SPA. Please see paragraphs 6.1118 et seq in Chapter 6, which provide a detailed assessment.</p> <p>Data collected through desk study complemented by survey data collected during various surveys carried out during the period 2015 to 2018 have led to the conclusion that no parts of the land at the development site provide terrestrial</p>	Yes	Yes

Morecambe Bay and Duddon Estuary SPA – decommissioning phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			<p>supporting habitat for SPA birds (BSG Ecology, 2018 – paragraphs 2.3 and 2.6), hence this impact pathway has no relevance with regards to SPA birds using the proposed development site.</p> <p>The SPA is 17.07 km south-east of the main mine site and beyond any Zone of Influence (Chapter 17 Marine Environment, Environmental Statement, West Cumbria Mining, 2018, paragraphs 17.9.1 and 17.9.2), hence this impact pathway has no relevance.</p>		
7	Deterioration of marine water quality as a result of disturbance of contaminated land and mobilisation of pollutants decommissioning) on brownfield land (including changes in pH, temperature, salinity, and dissolved oxygen) discharged via Saltom Bay outfall	Potential effect on SPA birds within surrounding functional habitat through impacts on prey availability.	<p>The Morecambe Bay and Duddon Estuary SPA is located 17.07 km south-east of the main mine site, hence there is no impact pathway from any deterioration of marine water quality arising from discharges from the existing discharge pipe into Saltom Bay for birds within the SPA. Please see paragraphs 6.118 et seq in Chapter 6, which provide a detailed assessment.</p> <p>Data collected through desk study complemented by survey data collected during various surveys carried out during the period 2015 to 2018 have led to the conclusion that no parts of the land at the development site provide terrestrial supporting habitat for SPA birds (BSG Ecology, 2018 – paragraphs 2.3 and 2.6), hence this impact pathway has no relevance with regards to SPA birds using the proposed development site.</p> <p>The SPA is 17.07 km south-east of the main mine site and beyond any Zone of Influence (Chapter 17 Marine</p>	Yes	Yes

Morecambe Bay and Duddon Estuary SPA – decommissioning phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			Environment, Environmental Statement, West Cumbria Mining, 2018, paragraphs 17.9.1 and 17.9.2), hence this impact pathway has no relevance.		
8	Deterioration of marine water quality as a result of sediment-laden surface water run-off during decommissioning, via Pow Beck catchment	Potential effect on SPA birds within surrounding functional habitat through impacts on prey availability	<p>The Morecambe Bay and Duddon Estuary SPA is located c.15.6 km south-east of the point where the Pow Beck discharges to sea, hence there is no impact pathway from sediment-laden water run off from any discharges via the Pow Beck for birds within the SPA. Please see paragraphs 6.118 et seq in Chapter 6, which provide a detailed assessment.</p> <p>Data collected through desk study complemented by survey data collected during various surveys carried out during the period 2015 to 2018 have led to the conclusion that no parts of the land at the development site provide terrestrial supporting habitat for SPA birds (BSG Ecology, 2018 – paragraphs 2.3 and 2.6), hence this impact pathway has no relevance with regards to SPA birds using the proposed development site.</p> <p>The SPA is c.15.6 km south-east of the point where the Pow Beck discharges to the sea and beyond any Zone of Influence (Chapter 17 Marine Environment, Environmental Statement, West Cumbria Mining, 2018, paragraphs 17.9.1 and 17.9.2), hence this impact pathway has no relevance.</p>	Yes	Yes
9	Deterioration of marine water quality as a result of	Potential effect on SPA birds within surrounding functional habitat through	The Morecambe Bay and Duddon Estuary SPA is located c.15.6 km south-east of the point where the Pow Beck discharges to sea, hence there is no impact pathway from	Yes	Yes

Morecambe Bay and Duddon Estuary SPA – decommissioning phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
	disturbance of contaminated land and mobilisation of pollutants during decommissioning) on brownfield land (including changes in pH, temperature, salinity, and dissolved oxygen) discharged via Pow Beck catchment	impacts on prey availability	<p>any deterioration of marine water quality arising from discharges via the Pow Beck for birds within the SPA. Please see paragraphs 6.118 et seq in Chapter 6, which provide a detailed assessment.</p> <p>Data collected through desk study complemented by survey data collected during various surveys carried out during the period 2015 to 2018 have led to the conclusion that no parts of the land at the development site provide terrestrial supporting habitat for SPA birds (BSG Ecology, 2018 – paragraphs 2.3 and 2.6), hence this impact pathway has no relevance with regards to SPA birds using the proposed development site.</p> <p>The SPA is c.15.6 km south-east of the point where the Pow Beck discharges to the sea and beyond any Zone of Influence (Chapter 17 Marine Environment, Environmental Statement, West Cumbria Mining, 2018, paragraphs 17.9.1 and 17.9.2), hence this impact pathway has no relevance.</p>		
10	Subsidence effects under the terrestrial environment	Subsidence under the terrestrial environment as a result of sub-surface mining activities	No subsidence is expected to impact on the SPA or its qualifying features during the decommissioning phase as all mining will have ceased. Any subsidence will have occurred above the mining panels and during the operational phase. The SPA is 17.07 km south-east of the main mine site and beyond any Zone of Influence (Chapter 17 Marine Environment, Environmental Statement, West Cumbria Mining, 2018, paragraphs 17.9.1 and 17.9.2), hence this impact pathway has no relevance.	Yes	Yes

Morecambe Bay and Duddon Estuary SPA – decommissioning phase impacts					
	Impact Mechanism	Potential impacts arising from the proposed development	Assessment of effects / likelihood of occurrence, taking into account mitigation (avoidance or reduction) measures	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway alone?	Can it be ascertained that there is no adverse effect of the project on site integrity through this pathway in combination with other plans or projects (see also Chapter 8)?
			Please see paragraphs 6.187 et seq in Chapter 6, which provides an assessment of the effects of subsidence.		
11	Subsidence effects under the marine environment	Subsidence under the marine environment as a result of sub-surface mining activities	<p>No subsidence is expected to impact on the SPA or its qualifying features during the decommissioning phase as all mining will have ceased. Any subsidence will have occurred above the mining panels and during the operational phase. The SPA is 17.07 km south-east of the main mine site and beyond any Zone of Influence (Chapter 17 Marine Environment, Environmental Statement, West Cumbria Mining, 2018, paragraphs 17.9.1 and 17.9.2), hence this impact pathway has no relevance.</p> <p>Please see paragraphs 6.187 et seq in Chapter 6, which provides an assessment of the effects of subsidence.</p>	Yes	Yes

7.40 Overall it is concluded that all identified effects can be fully mitigated through the adoption of appropriate measures as detailed in Tables 2 to 19. Consequently it is concluded that there will not be an adverse effect on the integrity of the following European sites (see also our detailed conclusions in Chapter 9):

- Solway Firth Proposed Special Protection Area (pSPA) – 1.16 km to the north-west of the main mine site;
- River Ehen Special Area of Conservation (SAC) – 3.00 km east of the main mine site;
- River Derwent and Bassenthwaite Lake SAC – 10.03 km north-east of the main mine site;
- Lake District High Fells SAC – 10.18 km east of the main mine site;
- Drigg Coast SAC – 14.45 km south-east of the main mine site; and,
- Morecambe Bay and Duddon Estuary Special Protection Area (SPA) – 17.07 km south-east of the main mine site.

8 The identification of other plans and projects

8.1 As part of the assessment, other plans and projects with potential to have 'in-combination' impacts on European sites have also been considered (as required under Regulation 63 of the Conservation of Habitats and Species Regulations 2017).

8.2 In section 3 (paragraphs 3.6 et seq) a number of impact mechanisms are identified, all of which have subsequently been assessed to determine the likelihood and magnitude of any impacts on European sites that might arise. The following provides comments on each pathway in relation to the scope for the WCM project to have in-combination impacts with other plans or projects:

- *Direct loss of or damage to terrestrial habitat:* The proposed development on the land will not impact directly on any European sites, the nearest being the Solway Firth pSPA, which is 1.16 km to the north-west of the development site boundary. No mining will take place underneath any European site. There is no evidence that the land at the development site is functionally linked with any European site, including the Solway Firth pSPA and its associated birds. Consequently no impacts are predicted on land that is critical to or necessary for the ecological or behavioural functioning of the qualifying features for which a European site has been designated (or any other habitats or species necessary for the conservation of the qualifying features). This assessment applies to all development stages. Since the WCM project gives rise to no effect on any European site via this pathway there is no effect with which any effect of another plan or project can combine. Hence the project gives rise to no adverse effect on the integrity of any European site in combination with any other plan or project.
- *Disturbance of marine or terrestrial qualifying species (visual/noise/vibration):*
 - *Terrestrial qualifying species:* The visual, noise and vibration disturbance assessment has concluded that no terrestrial qualifying species of any European site (or any habitats or species necessary to their conservation) will be adversely affected by visual, noise, vibration disturbance. This assessment applies to all development stages. Since the WCM project gives rise to no effect on any European site via this pathway there is no effect with which the effect of any other plan or project can combine. Hence the project gives rise to no adverse effect on the integrity of any European site in combination with any other plan or project through this pathway
 - *Marine qualifying species:*
 - The visual disturbance assessment has concluded that no marine qualifying species of any European site (or any habitats or species necessary to their conservation) will be adversely affected by visual disturbance. This assessment applies to all development stages. Since the WCM project gives rise to no effect on any European site via this pathway there is no effect with which the effect of any other plan or project can combine. Hence the project gives rise to no adverse effect on the integrity of any European site in combination with any other plan or project through this pathway
 - The noise and vibration disturbance assessment concludes that there is no impact pathway for noise and vibration impacts during the construction and decommissioning phases and hence there is no scope for in combination effects. The assessment acknowledges that there is potential for sound and vibration impacts on the marine environment during the operational phase, but concludes there is no real likelihood of significant impacts on marine qualifying species. In relation to potential in combination effects of noise and vibration impacts on marine qualifying species during the operational phase, further details are set out below.

- *Direct loss of or damage to marine habitat or disturbance to marine species from scouring and/or sedimentation from any discharges via the Saltom Bay outfall:* Any potential scouring / sedimentation impacts of the WCM project will be addressed through the comprehensive mitigation measures described above. In addition, the worst case (spatial) limit of any discharge-related effects is estimated to be 162m from the outfall pipe; this represents a “combined” zone of influence, comprising the area affected by the proposed WCM development discharge in combination with the existing leachate discharge from the landfill site (Chapter 17 Marine Environment, paragraph 17.29.17, Environmental Statement, 2018). Consequently a 162m zone from the marine outfall has been adopted as combined WCM project / leachate zone of influence for the ‘in-combination’ assessment. This assessment applies to all development stages. Further details are set out below.
- *Deterioration of marine water quality as a result of sediment-laden surface water run-off via the Saltom Bay outfall:* Any potential sedimentation impacts of the WCM project will be addressed through the comprehensive mitigation measures described above. In addition the worst case (spatial) limit of any discharge-related effects is estimated to be 162m from the outfall pipe; this represents a “combined” zone of influence, comprising the area affected by the proposed WCM development discharge, in combination with the existing leachate discharge from the landfill site (Chapter 17 Marine Environment, paragraph 17.29.17, Environmental Statement, 2018). Consequently a 162m zone from the marine outfall has been adopted (as the combined WCM project / leachate zone of influence) for the ‘in-combination’ assessment. This assessment applies to all development stages. Further details are set out below.
- *Deterioration of marine water quality as a result of run-off from main mine site, including pollution related impacts arising from disturbance of contaminated land and mobilisation of pollutants (including changes in pH, temperature, salinity, and dissolved oxygen) via the Saltom Bay outfall:* The proposed development includes a number of measures that are designed to mitigate effects on water quality, including the use of silt traps, oil interceptors and attenuation lagoons. Pollution control measures are set out within a draft Environmental Management Plan and this will be complemented by a Draft Marine Environmental Monitoring Plan, which outlines how the marine environment around the location of the marine outfall will be monitored to ensure that the discharge of storm water and excess surface water (in accordance with an Environmental Permit) will be undertaken. The marine assessment has concluded that there will be negligible effects on the marine environment as a result of changes in water quality. This assessment applies to all development stages. In addition, the worst case (spatial) limit of any discharge-related effects is estimated to be 162m from the outfall pipe; this represents a “combined” zone of influence, comprising the area affected by the proposed WCM development discharge in combination with the existing leachate discharge from the landfill site (Chapter 17 Marine Environment, paragraph 17.29.17, Environmental Statement, 2018). Consequently a 162m zone from the marine outfall has been adopted as combined WCM project / leachate zone of influence for the ‘in-combination’ assessment. Further details are set out below.
- *Direct loss of or damage to marine habitat or disturbance to marine species from scouring and/or sedimentation from any discharges via Pow Beck:* Any potential scouring / sedimentation impacts of the WCM project will be addressed through the comprehensive mitigation measures described above. The marine assessment has concluded that no scouring impacts at St Bees beach are predicted hence no in combination effect will arise through the scouring pathway. This assessment applies to all development stages. In relation to in combination effects of sedimentation impacts, further details are set out below.
- *Deterioration of marine water quality as a result of sediment-laden surface water run-off via Pow Beck:* Any such potential sedimentation impacts of the WCM project will be addressed through the comprehensive mitigation measures described above. This assessment applies to all development stages. In relation to potential in combination effects of sedimentation impacts further details are set out below.

- *Deterioration of marine water quality as a result of run-off from main mine site, including pollution related impacts arising from disturbance of contaminated land and mobilisation of pollutants (including changes in pH, temperature, salinity, and dissolved oxygen) via Pow Beck:* Any such potential pollution impacts of the WCM project will be addressed through the comprehensive mitigation measures described above. This assessment applies to all development stages. In relation to potential in combination effects of pollution impacts, further details are set out below.
- *Dust and other airborne contamination of marine and terrestrial habitats:* The air quality assessment has concluded that air quality impacts on European sites are highly unlikely. IAQM guidance indicates that dust is not likely to disperse further than 400m from the development site. As the nearest European site is 1.16 km to the north-west (the Solway Firth pSPA), there is no mechanism by which dust can migrate as far as the European site boundary. Other pollutants, in particular NOx and N deposition, are not predicted to have a significant effect on any European site. Any deposition within the marine environment will be rapidly diluted and dispersed. Where elevated NOx and N deposition levels are predicted (ie at St Bees Head SSSI and Clints Quarry SSSI, both located much closer to the development than any European site) the process contribution (from the proposed development taken alone) is small (Chapter 15 Air Quality, sections 15.6.58 et seq (in respect of the construction phase) and 15.6.70 et seq (in respect of the operational phase)). In addition these elevated levels are associated with the proximity of the specific SSSIs to WCM's construction / operation traffic using the A595 and, due to the relevant Natural England guidance on air quality and HRA (Natural England, 2018), emissions from traffic increases are not relevant in this case. This is because the NE guidance states that emissions from road traffic increases on European sites need only be considered in situations where there is a predicted increase in traffic from the development (alone or in combination with other plans or projects) that falls within 200 metres of a road affected by a plan or project: in this case there are no European sites located within 200m of any road (including the A595) that will be affected by the development. This assessment applies to all development stages. The analysis of air quality impacts presented in the assessment represents, as is required, a cumulative assessment of the proposed development (i.e. in combination with other plans and projects) and this covers dust, traffic, and other operational controlled emissions (Chapter 15 Air Quality, section 15.7, paragraph 15.7.1 - 15.7.4 [dust], paragraph 15.7.5 – 15.7.10 [traffic], paragraph 15.7.11 – 15.7.12 [controlled emissions], Environmental Statement, 2018). It is concluded that there will be no adverse effect on the integrity of any European site (through impacts on the populations of the qualifying species or through impacts on supporting habitats or species) through this pathway alone or in combination with other plans or projects.
- *Subsidence under the terrestrial environment:* The assessment above has concluded that there will be no adverse impact from the WCM project on any qualifying feature of any European site through this pathway. Since the WCM project gives rise to no effect on any European site via this pathway there is no effect with which the effect of any other plan or project can combine. Hence the project gives rise to no adverse effect on the integrity of any European site in combination with any other plan or project. This assessment applies to all development stages.
- *Subsidence under the marine environment:* The assessment above has concluded that there will be no adverse impact from the WCM project on any qualifying feature of any European site through this pathway, albeit that there will be a very small amount of subsidence in the marine environment during the operational phase. There are no other plans or projects known with subsidence impacts which could act in combination with the predicted subsidence from the WCM project and as such no scope of any in-combination impact via this pathway. This assessment applies to all development stages.

WCM's Saltom Bay discharges

- 8.3 As noted above, the WCM project could potentially have an impact in combination with another plan or project through another plan or project interacting with the "combined" 162m zone of influence at Saltom Bay (reflecting the proposed development's discharges into Saltom Bay in combination with the existing leachate discharge into Saltom Bay) as described above.
- 8.4 Other plans and projects have therefore been considered if they include a proposed discharge to sea which could combine with the 162m zone of influence from the Saltom Bay outfall.

- 8.5 There are multiple licensable discharges to sea in the vicinity of Saltom Bay which have the potential to interact with the surface water runoff discharges from the Saltom Bay outfall associated with the proposed development. These are discussed in Chapter 17, paragraph 17.34, of the Environmental Statement:
- A private sewer discharge from a pharmacy in Kells (discharging to Saltom Bay);
 - A United Utilities pumping station discharge at Whitehaven Marina (discharging to Saltom Bay);
 - The Sellafield discharge outfalls (at Seascale); and
 - The United Utilities wastewater treatment works discharge (at Parton, north of Whitehaven).
- 8.6 The private sewer discharge outfall is located approximately 350 m from the proposed WCM discharge point and it is permitted to discharge no more than 0.2 m³ per day. The permit associated with this discharge states that the discharge must have no adverse visible effect on the receiving environment. Modelling shows that the private sewer discharge from a pharmacy in Kells (to Saltom Bay) is outside the zone of influence for the WCM discharge (Chapter 17 Marine Environment, paragraph 17.34.7, Environmental Statement, 2018). This is the case even when the outfall is fully exposed at low tide. Due to the separation distance and the very small volume of this discharge, a significant in-combination effect is not predicted to occur (Chapter 17 Marine Environment, paragraph 17.34.8, Environmental Statement, 2018).
- 8.7 The United Utilities pumping station discharge (to Saltom Bay) is also outside the zone of influence for the WCM discharge (Chapter 17 Marine Environment, paragraph 17.34.7, Environmental Statement, 2018). The pumping station may only discharge to sea in emergency circumstances when the pumping station is inoperative. No discharge occurs under normal circumstances. Due to the operational restrictions on this outfall, a significant in-combination effect is not predicted (Chapter 17 Marine Environment, paragraph 17.34.9, Environmental Statement, 2018).
- 8.8 The Sellafield outfalls extend ~2.1 km from shore into the north-eastern Irish Sea and are located approximately 14.5 km directly south of the Saltom Bay discharge point (~17 km by sea). The Sellafield discharge outfall (at Seascale) is therefore also outside the zone of influence for the WCM discharge (Chapter 17 Marine Environment, paragraph 17.34.7, Environmental Statement, 2018). An in-combination effect is not predicted to occur due to the separation distance (Chapter 17 Marine Environment, paragraph 17.34.11, Environmental Statement, 2018).
- 8.9 The United Utilities wastewater treatment works discharge (at Parton, north of Whitehaven) is located approximately 5 km from the proposed discharge point in Saltom Bay. The discharge point of this outfall is therefore also outside the zone of influence for the WCM discharge (Chapter 17 Marine Environment, paragraph 17.34.7, Environmental Statement, 2018). Furthermore, the existing sewage discharge is discharged via diffuser(s) at a distance of ~1.9 km from shore, in the main current flows of the Solway Firth, and has an initial dilution factor of 50, which is generally considered appropriate for secondary treated sewage effluent. The United Utilities wastewater treatment works discharge is therefore considered to have sufficient initial and secondary mixing to ensure that it will not produce cumulative or in-combination impacts with the Saltom Bay discharge. (Chapter 17 Marine Environment, paragraph 17.34.10, Environmental Statement, 2018).
- 8.10 There are no other projects which CCC is aware of in the marine environment in the proximity of the proposed mine that need to be included in a cumulative assessment. The NuGen Moorside development is currently on hold, and timescales, the nature and scope of the project, and its potential impacts are unknown. Therefore, no cumulative impact assessment is provided for this development.
- 8.11 In summary, therefore the proposed development will have no adverse effect on the integrity of any European site via Saltom Bay either alone or 'in combination' with any other plans or projects.

WCM discharges via Pow Beck leading to St Bees Beach

- 8.12 As noted above, the WCM project could potentially have an impact in combination with impacts from other plans or projects through other plans or projects interacting with any WCM impacts at the marine environment at St Bees Beach.

- 8.13 In relation to the risk of scouring there is predicted to be no impact at the beach from WCM's project and so no risk of any in combination impact.
- 8.14 In relation to the risk of sediment or other pollution, no significant pollution impact on the marine environment is predicted via the Pow Beck pathway (see Chapter 17, Marine Environment, paragraph 17.29.22, Environmental Statement, 2018), indeed any such impact is regarded as negligible. As such an in-combination effect with other plans or projects is considered very unlikely.
- 8.15 However, to ensure a comprehensive assessment, nearby licensable discharges to sea in the vicinity of the mouth of Pow Beck have nevertheless been investigated.
- 8.16 The zone of influence (ZOI) of the proposed surface water runoff discharge to Saltom Bay has been calculated as approximately 162 m and is over 8 km (by sea) from the mouth of Pow Beck. Hence no in-combination effect is predicted between the two sources of surface water runoff associated with the proposed development.
- 8.17 The closest licensed discharge to the mouth of Pow Beck is a United Utilities pumping station located at Nethertown, which has a permit to discharge to sea (permit no. 017470153) approximately 4 km south of the mouth of Pow Beck. However, under the conditions of the permit, the pumping station may only discharge to sea in emergency circumstances when the pumping station is inoperative as a result of e.g. electrical failure or rising main failure. No discharge occurs under normal circumstances. For this reason this discharge has been scoped out of the in-combination impact assessment.
- 8.18 The United Utilities WwTW located at Braystones, south of Nethertown, discharges to sea via a long sea outfall (permit no. 017470152). The discharge point of this outfall is located approximately 7 km south from the mouth of Pow Beck and hence any combined effect between it and any discharges made via Pow Beck is very unlikely. Furthermore, the existing sewage discharge is discharged via diffuser(s) at a distance of ~2 km from shore and has an initial dilution factor generally considered appropriate for secondary treated sewage effluent. The existing discharge is therefore considered to have sufficient initial and secondary mixing to ensure that it will not produce cumulative or in-combination impacts with other discharges.
- 8.19 The Sellafeld outfalls extend ~2.1 km from shore into the north-eastern Irish Sea and are located approximately 8.8 km from the mouth of Pow Beck and hence, again, it is considered highly unlikely that the two plumes will interact. Furthermore, the two discharges are not similar; the proposed discharges to Pow Beck are ambient temperature freshwater which, with good practice guidelines in place, will not be contaminated, while the Sellafeld discharge is a cooling water discharge, i.e. warm seawater. There is therefore no realistic likelihood of in-combination effects between the two discharges.
- 8.20 There are no other projects which CCC is aware of in the marine environment in the proximity of the proposed mine that need to be included in a cumulative assessment. The NuGen Moorside development is currently on hold, and timescales, the nature and scope of the project, and its potential impacts are unknown. Therefore, no cumulative impact assessment is provided for this development.
- 8.21 In summary, therefore the proposed development will have no adverse effect on the integrity of any European site via Pow Beck and St Bees head either alone or 'in combination' with any other plans or projects.

Noise/vibration impacts on marine qualifying species (and supporting habitats and species)

- 8.22 A search has been carried out for Marine Management Organisation (MMO) active licences and current licence applications to identify any marine projects which could, in combination with WCM's project, have an in combination effect on any European site via the noise / vibration impact pathway. This has shown that there is no such project located within the MMO's northwest Marine Planning Area (inshore and offshore) that has the potential to have an in-combination effect with WCM's proposed development.

- 8.23 The in-combination assessment has also considered the following existing potential sources of marine noise which may have the potential to interact with the noise / vibration impacts on marine species associated with the proposed development:
- **Shipping:** There are no major shipping lanes in the area around the proposed development and local vessel traffic densities are considered to be low. There is significant vessel traffic associated with the ports in the vicinity of Morecambe Bay (~50 km to the south), however this mostly consists of relatively small supply ships and the nearest major port is Liverpool, >100 km to the south of the proposed development.
 - **Windfarms:** The closest operational windfarms located in the sea are Robin Rigg (~25 km to the north) and Walney (~38 km to the south).
 - **Military areas:** There are multiple military practice areas in the north-eastern Irish Sea, the closest of which include a firing practice area to the northwest of the proposed offshore mining area (~9 km at closest point), and the Eskmeals Range, located near Ravenglass, which is charted as extending to 1 km south of South Head. No restrictions are placed on the right to transit these areas at any time, and the practice areas are operated using a clear range procedure, i.e. exercises and firing only take place when the areas are considered to be clear of all shipping. It can therefore be assumed that these areas are used only infrequently.
- 8.24 All of these listed activities currently contribute to baseline noise conditions in the area of sea above the proposed offshore mining area; however, these are all intermittent sources of noise that are expected to have a temporary effect on the marine environment. Furthermore, WCM is not aware of any proposals to: increase shipping movements in the area; extend or increase activity associated with the nearest offshore windfarm sites or; increase use of nearby firing ranges and military practice areas. It is therefore concluded that sound and vibration arising from the proposed development will not have an effect on any European site in combination with other plans and projects.

9 Conclusions

- 9.1 The proposed development is not directly connected with or necessary to the management of any European site (Regulation 63(1)(b) of the Conservation of Habitats and Species Regulations 2017).
- 9.2 With reference to Regulation 63(1)(a) of the Conservation of Habitats and Species Regulations 2017, the assessment has concluded that some aspects of the proposed development are likely to have a significant effect on a European site, when considered alone. For this reason an 'appropriate assessment' has been carried out. In reaching this conclusion consideration has been given to the implications of the judgment released from the Court of Justice of the European Union 'People Over Wind and Sweetman', 12 April 2018, C-323/17.
- 9.3 The appropriate assessment has considered impacts on all qualifying habitats and species associated with the relevant European sites (and other habitat and species necessary to their conservation). This takes into account the direction provided by a second recent HRA judgment (Holohan & Ors. v An Bord Pleanála, 7 November 2018, C - 461/17).
- 9.4 With regard to all identified impacts it is concluded that, in view of the site's conservation objectives, the WCM project will not have an adverse effect on the integrity of any European site either alone or in combination with any other plan or project.
- 9.5 The conclusions of the assessment for each European site are summarised in Table 20 below.

Table 20: A summary of the assessment conclusions for European sites

Impact Mechanism	Solway Firth pSPA	River Ehen SAC	River Derwent and Bassenthwaite Lake SAC	Lake District High Fells SAC	Drigg Coast SAC	Morecambe Bay and Duddon Estuary SPA
Distance from the development site	1.16 km north-west	3 km east	10.03 km north-east	10.18 km east	14.45 km south-east	17.07 km south-east
Direct loss of or damage to terrestrial habitat	No adverse effects on site integrity either alone or in combination with any other plan or project.	No adverse effects on site integrity either alone or in combination with any other plan or project.	No adverse effects on site integrity either alone or in combination with any other plan or project.	No adverse effects on site integrity either alone or in combination with any other plan or project.	No adverse effects on site integrity either alone or in combination with any other plan or project.	No adverse effects on site integrity either alone or in combination with any other plan or project.
Disturbance of marine or terrestrial qualifying species (visual / noise / vibration)	No adverse effects on site integrity either alone or in combination with any other plan or project.	No adverse effects on site integrity either alone or in combination with any other plan or project.	No adverse effects on site integrity either alone or in combination with any other plan or project.	No adverse effects on site integrity either alone or in combination with any other plan or project.	No adverse effects on site integrity either alone or in combination with any other plan or project.	No adverse effects on site integrity either alone or in combination with any other plan or project.
Direct loss of or damage to marine habitat or disturbance to marine species from scouring and/or sedimentation from any discharges via the Saltom Bay outfall	No adverse effects on site integrity either alone or in combination with any other plan or project.	No adverse effects on site integrity either alone or in combination with any other plan or project.	No adverse effects on site integrity either alone or in combination with any other plan or project.	No adverse effects on site integrity either alone or in combination with any other plan or project.	No adverse effects on site integrity either alone or in combination with any other plan or project.	No adverse effects on site integrity either alone or in combination with any other plan or project.
Direct loss of or damage to marine habitat or disturbance to marine species from scouring and/or sedimentation from any discharges via Pow Beck	No adverse effects on site integrity either alone or in combination with any other plan or project.	No adverse effects on site integrity either alone or in combination with any other plan or project.	No adverse effects on site integrity either alone or in combination with any other plan or project.	No adverse effects on site integrity either alone or in combination with any other plan or project.	No adverse effects on site integrity either alone or in combination with any other plan or project.	No adverse effects on site integrity either alone or in combination with any other plan or project.
Deterioration of marine water quality as a result of sediment-laden surface water run-off via the Saltom Bay outfall	No adverse effects on site integrity either alone or in combination with any other plan or project.	No adverse effects on site integrity either alone or in combination with any other plan or project.	No adverse effects on site integrity either alone or in combination with any other plan or project.	No adverse effects on site integrity either alone or in combination with any other plan or project.	No adverse effects on site integrity either alone or in combination with any other plan or project.	No adverse effects on site integrity either alone or in combination with any other plan or project.

Impact Mechanism	Solway Firth pSPA	River Ehen SAC	River Derwent and Bassenthwaite Lake SAC	Lake District High Fells SAC	Drigg Coast SAC	Morecambe Bay and Duddon Estuary SPA
Deterioration of marine water quality as a result of sediment-laden surface water run-off via Pow Beck	No adverse effects on site integrity either alone or in combination with any other plan or project.	No adverse effects on site integrity either alone or in combination with any other plan or project.	No adverse effects on site integrity either alone or in combination with any other plan or project.	No adverse effects on site integrity either alone or in combination with any other plan or project.	No adverse effects on site integrity either alone or in combination with any other plan or project.	No adverse effects on site integrity either alone or in combination with any other plan or project.
Deterioration of marine water quality as a result of run-off from main mine site, including pollution related impacts arising from disturbance of contaminated land and mobilisation of pollutants (including changes in pH, temperature, salinity, and dissolved oxygen) via Saltom Bay outfall	No adverse effects on site integrity either alone or in combination with any other plan or project.	No adverse effects on site integrity either alone or in combination with any other plan or project.	No adverse effects on site integrity either alone or in combination with any other plan or project.	No adverse effects on site integrity either alone or in combination with any other plan or project.	No adverse effects on site integrity either alone or in combination with any other plan or project.	No adverse effects on site integrity either alone or in combination with any other plan or project.
Deterioration of marine water quality as a result of run-off from main mine site, including pollution related impacts arising from disturbance of contaminated land and mobilisation of pollutants (including changes in pH, temperature, salinity, and dissolved oxygen) via Pow Beck	No adverse effects on site integrity either alone or in combination with any other plan or project.	No adverse effects on site integrity either alone or in combination with any other plan or project.	No adverse effects on site integrity either alone or in combination with any other plan or project.	No adverse effects on site integrity either alone or in combination with any other plan or project.	No adverse effects on site integrity either alone or in combination with any other plan or project.	No adverse effects on site integrity either alone or in combination with any other plan or project.
Dust and other airborne contamination of marine and terrestrial habitats	No adverse effects on site integrity either alone or in combination with any other plan or project.	No adverse effects on site integrity either alone or in combination with any other plan or project.	No adverse effects on site integrity either alone or in combination with any other plan or project.	No adverse effects on site integrity either alone or in combination with any other plan or project.	No adverse effects on site integrity either alone or in combination with any other plan or project.	No adverse effects on site integrity either alone or in combination with any other plan or project.

Impact Mechanism	Solway Firth pSPA	River Ehen SAC	River Derwent and Bassenthwaite Lake SAC	Lake District High Fells SAC	Drigg Coast SAC	Morecambe Bay and Duddon Estuary SPA
Subsidence effects	No adverse effects on site integrity either alone or in combination with any other plan or project.	No adverse effects on site integrity either alone or in combination with any other plan or project.	No adverse effects on site integrity either alone or in combination with any other plan or project.	No adverse effects on site integrity either alone or in combination with any other plan or project.	No adverse effects on site integrity either alone or in combination with any other plan or project.	No adverse effects on site integrity either alone or in combination with any other plan or project.
Overall conclusion re adverse effect on integrity	No adverse effects on site integrity either alone or in combination with any other plan or project.	No adverse effects on site integrity either alone or in combination with any other plan or project.	No adverse effects on site integrity either alone or in combination with any other plan or project.	No adverse effects on site integrity either alone or in combination with any other plan or project.	No adverse effects on site integrity either alone or in combination with any other plan or project.	No adverse effects on site integrity either alone or in combination with any other plan or project.

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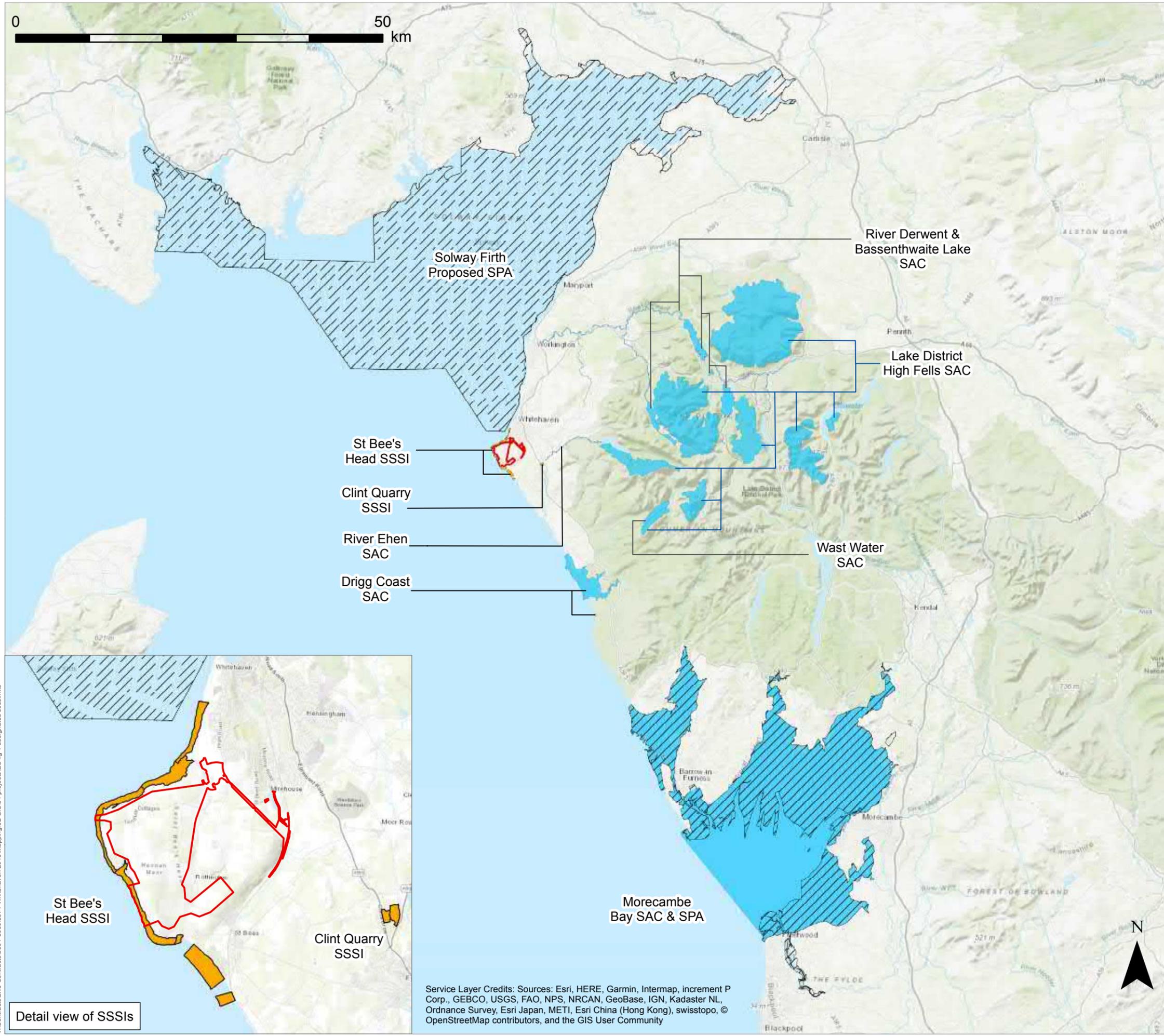
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11 Figures

Figure 1: Location of European sites within 25 km of the proposed development site.



- LEGEND**
- Site boundary
 - Site of Special Scientific Interest (SSSI)
 - Special Area of Conservation
 - Special Protection Area (SPA)
 - Proposed Special Protection Area (PSPA)



Detail view of SSSIs

Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, © OpenStreetMap contributors, and the GIS User Community



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PROJECT TITLE
 WHITEHAVEN

DRAWING TITLE
 Figure 1: Statutorily Designated Sites

DATE: 04.12.2018 CHECKED: NB SCALE: 1:500,000
 DRAWN: COH APPROVED: SB VERSION: 1.1

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Appendix 1: European site descriptions

The following table presents the site characterisation information for the following European sites: Solway Firth pSPA; River Ehen SAC; River Derwent and Bassenthwaite Lake SAC; Lake District High Fells SAC; Drigg Coast SAC; and Morecambe Bay and Duddon Estuary SPA.

Site Name	Qualifying Features	Conservation Objectives	Condition Assessment	Vulnerabilities
Solway Firth Proposed Special Protection Area (pSPA)	<p>The Solway Firth pSPA is a large estuarine/marine site with a total area of 1357.49 km² situated between the western coastal margins of Cumbria in England and Dumfries and Galloway in Scotland, off the west coast of Great Britain. It is one of the largest estuaries in the UK along with Morecambe Bay and the Wash. The Solway Firth (including the classified Upper Solway Flats and Marshes SPA and the proposed marine extension) supports populations of European importance of the following Annex 1 species:</p> <p>Red-throated diver (<i>Gavia stellata</i>) Whooper swan (<i>Cygnus cygnus</i>) Barnacle goose (<i>Branta leucopsis</i>) Golden plover (<i>Pluvialis apricaria</i>) Bar-tailed godwit (<i>Limosa lapponica</i>)</p> <p>The pSPA also supports migratory populations of European importance of the following species:</p> <p>Pink footed goose (<i>Anser brachyrhynchus</i>) Shelduck (<i>Tadorna tadorna</i>) Teal (<i>Anas crecca</i>) Pintail (<i>Anas acuta</i>)</p>	<p>In winter, the Solway Firth is a stronghold for red-throated diver, common scoter and goosander. An extension to the existing Upper Solway Flats & Marshes SPA is proposed because it supports important wintering populations of these species. In addition, a review in 2001 of the existing SPA showed that the mudflats, saltmarshes and grazing marshes also support important numbers of ringed plover, lapwing, cormorant, black-headed gull, common gull and herring gull. Red-throated divers tend to feed on fish, crabs and marine worms. Scoters feed mainly on bivalves during winter and goosander feed exclusively on small fish. They all forage primarily by surface diving, so the proposed conservation objectives seek to protect these feeding areas.</p> <p>The conservation objectives for the Solway Firth proposed SPA (Scottish Natural Heritage & Natural England, 2016b) are:</p> <p>To avoid deterioration of the habitats of the qualifying species or significant</p>	<p>Scottish Natural Heritage and Natural England (2016a) has published a summary of the scientific case for site selection and this includes an assessment of the populations of key interest features (bird species). This work has concluded that the site qualifies as a SPA but no information is provided about the current condition of the site.</p> <p>Distribution maps presented by Scottish Natural Heritage and Natural England (2016) indicate that species distribution in the vicinity of the proposed development can be summarised as follows:</p> <p>Red-throated diver: this species occurs relatively close to Whitehaven but it is shown as occurring offshore (i.e. not close to shore) at densities of 0.15-0.30 birds per km². The greatest densities are reported to be further north within the estuary.</p> <p>Common scoter: this species is reported to occur at low densities in the area near Whitehaven, i.e. 1 bird or less per km². The greatest densities are offshore to the north of</p>	<p>Disturbance of birds in core feeding areas.</p> <p>Direct impacts on prey species for qualifying features, e.g. dredging.</p> <p>Indirect impacts on prey species for qualifying species, e.g. pollution.</p> <p>Habitat loss or disturbance</p>

Site Name	Qualifying Features	Conservation Objectives	Condition Assessment	Vulnerabilities
	<p>Shoveler (<i>Anas clypeata</i>) Scaup (<i>Aythya marila</i>) Common scoter (<i>Melanitta nigra</i>) Goldeneye (<i>Bucephala clangula</i>) Goosander (<i>Mergus merganser</i>) Oystercatcher (<i>Haematopus ostralegus</i>) Knot (<i>Calidris canutus</i>) Ringed plover (<i>Charadrius hiaticula</i>) Grey plover (<i>Pluvialis squatarola</i>) Lapwing (<i>Vanellus vanellus</i>) Dunlin (<i>Calidris alpina</i>) Sanderling (<i>Calidris alba</i>) Redshank (<i>Tringa totanus</i>) Turnstone (<i>Arenaria interpres</i>) Curlew (<i>Numenius arquata</i>) Cormorant (<i>Phalacrocorax carbo</i>) Black-headed gull (<i>Larus ridibundus</i>) Common gull (<i>Larus canus</i>) Herring gull (<i>Larus argentatus</i>) The coastal area within the existing SPA includes a range of habitats including mudflats and sandflats, lagoons, salt marshes and inland water bodies. This diversity is extended into the marine environment with the sea bed comprising a wide range of mobile sediments.</p>	<p>disturbance to the qualifying species, subject to natural change, thus ensuring that the integrity of the site is maintained in the long-term and it continues to make an appropriate contribution to achieving the aims of the Birds Directive for each of the qualifying species. This contribution will be achieved through delivering the following objectives for each of the site's qualifying features: Avoid significant mortality, injury and disturbance of the qualifying features, so that the distribution of the species and ability to use the site are maintained in the long-term; To maintain the habitats and food resources of the qualifying features in favourable condition.</p>	<p>Whitehaven and on the north side of the estuary. Goosander: detailed information is not available on the distribution of this species. Ringed plover: low tide distributions are concentrated around Mersehead sands, Blackshaw bank and Skinburness. Lapwing: low tide distributions are concentrated around Blackshaw bank, Priests side bank, Silloth bay and the inner estuary. Cormorant: during non-breeding the cormorants range is extensive, including both coastal and inland waters. Black-headed gull: the species is widely distributed across the site, which is the western representative of the northern range in Great Britain. Common gull: the species is widely distributed across the site, which is the western representative of the northern range in Great Britain. Herring gull: the species is widely distributed across the site, which is the western representative of the northern range in Great Britain.</p>	

Site Name	Qualifying Features	Conservation Objectives	Condition Assessment	Vulnerabilities
River Ehen SAC	<p>The River Ehen is designated a SAC because it supports internationally important populations of the following Annex II species, which is a primary reason for selection of this site:</p> <p>Freshwater pearl mussel <i>Margaritifera margaritifera</i></p> <p>The River Ehen also supports a population of the following Annex II species, which is not a primary reason for site selection:</p> <p>Atlantic salmon <i>Salmo salar</i></p>	<p>The conservation objectives for the River Ehen SAC are as follows:</p> <ul style="list-style-type: none"> • Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring; <ul style="list-style-type: none"> o The extent and distribution of the habitats of qualifying species; o The structure and function of the habitats of qualifying species; o The supporting processes on which the habitats of qualifying species rely; o The populations of qualifying species; and o The distribution of qualifying species within the site. 	<p>There is no specific information available on the condition of the River Ehen SAC; however, examination of the condition assessment that has been completed for the component SSSI (River Ehen (Ennerdale Water to Keekle confluence SSSI) provides useful information about the status of this site.</p> <p>The most recent condition assessment was completed in 2012 and this concluded that the SSSI is 'unfavourable declining'. The reasons cited for this decline were over-grazing, water abstraction and water pollution.</p> <p>The condition assessment includes the following comment: '<i>In 2006 a survey of the river showed there had been a shift of the entire population since the 1996 baseline survey. Adult mussels were 10 years older and juvenile mussels very scarce and confined to high flow areas of the river. Through further survey work carried out in summer 2012 it is apparent that in some sections there has been a major shift in population numbers from the 2006 survey.</i>'</p>	<p>Loss or disturbance of habitat used by the qualifying species.</p> <p>Deterioration of water quality.</p> <p>Inappropriate riparian land management, including fertilizer and pesticides.</p> <p>Mortality, injury or disturbance of the qualifying species.</p> <p>Interruption of or interference with the life cycle of the qualifying species.</p>

Site Name	Qualifying Features	Conservation Objectives	Condition Assessment	Vulnerabilities
River Derwent and Bassenthwaite Lake SAC	<p>The River Derwent and Bassenthwaite Lake is designated a SAC because it supports internationally important examples of the following Annex I habitats, which is a primary reason for selection of this site:</p> <p>Oligotrophic to mesotrophic standing waters with vegetation of the <i>Littorelletea uniflorae</i> and/or of the <i>Isoëto-Nanojuncetea</i>.</p> <p>The site also supports the following Annex I habitat that is present as a qualifying feature, but which is not a primary reason for selection of this site:</p> <p>Water courses of plain to montane levels with the <i>Ranunculion fluitantis</i> and <i>Callitricho-Batrachion</i> vegetation.</p> <p>The River Derwent and Bassenthwaite Lake SAC also supports populations of the following Annex II species that are a primary reason for selection of this site:</p> <p>Marsh fritillary butterfly <i>Euphydryas (Eurodryas, Hypodryas) aurinia</i> Sea lamprey <i>Petromyzon marinus</i> Brook lamprey <i>Lampetra planeri</i> River lamprey <i>Lampetra fluviatilis</i> Atlantic salmon <i>Salmo salar</i> Otter <i>Lutra lutra</i> Floating water-plantain <i>Luronium natans</i></p>	<p>The conservation objectives for the River Derwent and Bassenthwaite Lake SAC are as follows:</p> <ul style="list-style-type: none"> • Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring; <ul style="list-style-type: none"> o The extent and distribution of qualifying natural habitats and habitats of qualifying species; o The structure and function (including typical species) of qualifying natural habitats o The structure and function of the habitats of qualifying species o The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely o The populations of qualifying species; and o The distribution of qualifying species within the site. 	<p>The River Derwent and Bassenthwaite Lake SAC comprises four SSSIs, the condition of which are summarised below.</p> <p>River Derwent and Tributaries SSSI: The most recent condition assessment has resulted in the following summary of the component units: favourable 24.33%, unfavourable recovering 20.93%, unfavourable no change 54.44%, unfavourable declining 0.3%. Where units have been assessed as being unfavourable, this is due to the presence of signal crayfish and inappropriate riparian management. A number of invasive species have been identified as requiring control and management, and inappropriate grazing and water pollution are also identified as contributing factors,</p> <p>Bassenthwaite Lake SSSI: The most recent condition assessment has resulted in the following summary of the component units: favourable 10.20%, unfavourable recovering 10.15%, unfavourable no change 79.65%. Where units have been assessed as being unfavourable, this is principally due to overgrazing and the presence of non-native species, which require control and management.</p> <p>Braithwaite Moss SSSI: The most recent condition assessment has resulted in the following summary of</p>	<p>Loss or disturbance of habitat used by the qualifying species.</p> <p>Land drainage works and channel modification.</p> <p>Deterioration of water quality, including increased nutrient loading.</p> <p>Inappropriate riparian land management, including fertilizer and pesticides.</p> <p>Mortality, injury or disturbance of the qualifying species.</p> <p>Interruption of or interference with the life cycle of the qualifying species.</p>

			the component units: unfavourable recovering 44.07%, unfavourable no change 55.93%. Where units have been assessed as being unfavourable, this is principally due to under-grazing and inappropriate drain management. Buttermere SSSI: This site is described as being 100% in favourable condition.	
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Site Name	Qualifying Features	Conservation Objectives	Condition Assessment	Vulnerabilities
Lake District High Fells SAC	The Lake District High Fells is designated a SAC because it supports internationally important examples of the following Annex I habitats, which are a primary reason for selection of this site: Oligotrophic to mesotrophic standing waters with vegetation of the <i>Littorelletea uniflorae</i> and/or of the <i>Isoëto-Nanojuncetea</i> Northern Atlantic wet heaths with <i>Erica tetralix</i> European dry heaths Alpine and Boreal heaths <i>Juniperus communis</i> formations on heaths or calcareous grasslands Siliceous alpine and boreal grasslands Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels Blanket bogs Siliceous scree of the montane to snow levels (<i>Androsacetalia alpinae</i> and <i>Galeopsietalia ladani</i>) Siliceous rocky slopes with chasmophytic vegetation	The conservation objectives for the Lake District High Fells SAC are as follows: Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring; The extent and distribution of qualifying natural habitats and habitats of qualifying species; The structure and function (including typical species) of qualifying natural habitats; The structure and function of the habitats of qualifying species; The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely; The populations of qualifying species; and The distribution of qualifying species within the site.	The Lake District High Fells SAC comprises ten SSSIs, the condition of which are summarised below. Armboth Fells SSSI: The most recent condition assessment concluded: favourable 24.02%, unfavourable recovering 74.89%, unfavourable declining 1.09%. Unfavourable condition is attributed to grazing pressure including deer grazing. Birk Fell SSSI: The most recent condition assessment concluded: unfavourable recovering 83.33%, unfavourable declining 16.67%. Unfavourable condition has been attributed to deer grazing. The woodland is unfavourable due to a lack of regeneration. Buttermere Fells SSSI: The most recent condition assessment concluded: favourable 11.66%, unfavourable recovering 68.10%, unfavourable no change 20.24%. Unfavourable condition is attributed to grazing pressure. Helvellyn & Fairfield SSSI: The most	Loss or disturbance of the qualifying habitats. Deterioration of water quality. Inappropriate riparian land management, including fertilizer and pesticides. Increased aerial deposition of pollutants. Inappropriate site management including grazing (both livestock and deer). Land drainage works and channel modification.

	<p>Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles</p> <p>The site also supports the following Annex I habitats, which are not a primary reason for selection of this site:</p> <p>Species-rich <i>Nardus</i> grasslands, on silicious substrates in mountain areas (and submountain areas in Continental Europe)</p> <p>Alkaline fens</p> <p>Calcareous rocky slopes with chasmophytic vegetation</p> <p>The Lake District High Fells SAC supports the following Annex II species, which are not a primary reason for site selection:</p> <p>Slender green feather-moss <i>Drepanocladus (Hamatocaulis) vernicosus</i></p>		<p>recent condition assessment concluded: favourable 2.48%, unfavourable recovering 95.61%, unfavourable no change 1.91%. Unfavourable condition is attributed to grazing pressure.</p> <p>Honister Crag SSSI: The most recent condition assessment concluded: favourable 8.44%, unfavourable recovering 47.89%, unfavourable declining 43.68%. Unfavourable condition is attributed in part to damage to the vegetation through the installation of a via ferrata.</p> <p>Pillar and Ennerdale Fells SSSI: The most recent condition assessment concluded: favourable 1.86%, unfavourable recovering 98.14%. The recovery of habitats has been achieved by removing / reducing grazing impacts.</p> <p>Scafell Pikes SSSI: The most recent condition assessment has resulted in the following summary of the component units: unfavourable recovering 100.00%, which has been achieved by reducing grazing impacts.</p> <p>Shap Fells SSSI: The most recent condition assessment concluded: favourable 19.90%, unfavourable recovering 67.95%, unfavourable no change 12.15%. Unfavourable condition is attributed to grazing pressure.</p> <p>Skiddaw Group SSSI: The most recent condition assessment has resulted</p>	
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			<p>concluded: favourable 4.70%, unfavourable recovering 95.30%. The recovery of habitats has been achieved by removing / reducing grazing impacts.</p> <p>Wasdale Screes SSSI: The most recent condition assessment concluded: unfavourable recovering 100.00%. The recovery of habitats has been achieved by removing / reducing grazing impacts.</p>	
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Site Name	Qualifying Features	Conservation Objectives	Condition Assessment	Vulnerabilities
Drigg Coast SAC	<p>The Drigg Coast is designated a SAC because it supports internationally important examples of the following Annex I habitats, which are a primary reason for selection of this site:</p> <p>Estuaries</p> <p>Atlantic decalcified fixed dunes (<i>Calluno-Ulicetea</i>)</p> <p>Dunes with <i>Salix repens</i> ssp. <i>argentea</i> (<i>Salicion arenariae</i>)</p> <p>The site also supports the following Annex I habitats, which are not a primary reason for the selection of the site:</p> <p>Mudflats and sandflats not covered by seawater at low tide</p> <p>Salicornia and other annuals colonizing mud and sand</p> <p>Atlantic salt meadows (<i>Glauco-Puccinellietalia maritimae</i>)</p> <p>Embryonic shifting dunes</p> <p>"Shifting dunes along the shoreline with <i>Ammophila arenaria</i> ("white dunes")"</p> <p>"Fixed coastal dunes with herbaceous vegetation ("grey dunes")" *</p> <p>Priority feature</p> <p>Humid dune slacks</p>	<p>The conservation objectives for the Drigg Coast SAC are as follows:</p> <p>Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring;</p> <p>The extent and distribution of qualifying natural habitats and habitats of qualifying species;</p> <p>The structure and function (including typical species) of qualifying natural habitats;</p> <p>The structure and function of the habitats of qualifying species;</p> <p>The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely;</p> <p>The populations of qualifying species; and</p> <p>The distribution of qualifying species within the site.</p>	<p>The Drigg Coast SAC comprises a single SSSI (Drigg Coast SSSI) the condition of which is summarised below.</p> <p>The most recent condition assessment has resulted in the following summary of the component units: favourable 65.12%, unfavourable recovering 20.49%, unfavourable no change 12.19% unfavourable declining 2.19%.</p> <p>The condition assessment reports that there are local issues with sea buckthorn and Japanese rose, where scrub is impacting on dune habitat. Lack of grazing is also reported to be an issue in some locations.</p>	<p>Loss or disturbance of the qualifying habitats.</p> <p>Direct impacts on qualifying features, e.g. dredging.</p> <p>Indirect impacts on qualifying species, e.g. pollution.</p> <p>Inappropriate riparian land management, including fertilizer and pesticides. Deterioration of water quality.</p> <p>Increased aerial deposition of pollutants.</p> <p>Inappropriate site management including grazing.</p>

Site Name	Qualifying Features	Conservation Objectives	Condition Assessment	Vulnerabilities
Morecambe Bay and Duddon Estuary SPA	<p>The site qualifies under Article 4.1 of the Directive (2009/147/EC) as it is used regularly by 1% or more of the Great Britain populations of a number of waterbird species listed in Annex I. Over winter the site regularly supports:</p> <p>Whooper swan <i>Cygnus Cygnus</i>; Little egret <i>Egretta garzetta</i>; Golden plover <i>Pluvialis apricaria</i>; Ruff <i>Calidris pugnax</i>; Bar-tailed godwit <i>Limosa lapponica</i>; and Mediterranean gull <i>Larus melancephalus</i>;</p> <p>During the breeding season the site regularly supports:</p> <p>Common tern <i>Sterna hirundo</i>; Sandwich tern <i>Sterna sandvicensis</i>; and Little tern <i>Sternula albifrons</i></p> <p>The site also qualifies under Article 4.2 of the Directive (2009/147/EC) as it is used regularly birds on passage:</p> <p>Pink-footed goose <i>Anser brachyrhynchus</i>; Shelduck <i>Tadorna tadorna</i>; Oystercatcher <i>Haematopus ostralegus</i>; Ringed plover <i>Charadrius hiaticula</i>; Red knot <i>Calidris canutus</i>; Sanderling <i>Calidris alba</i>; Dunlin <i>Calidris alpina alpina</i>; Black-tailed godwit <i>Limosa limosa</i>;</p>	<p>The conservation objectives for the Morecambe Bay and Duddon Estuary SPA are as follows:</p> <p>Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the aims of the Wild Birds Directive, by maintaining or restoring;</p> <p>The extent and distribution of the habitats of the qualifying features;</p> <p>The structure and function of the habitats of the qualifying features;</p> <p>The supporting processes on which the habitats of the qualifying features rely;</p> <p>The population of each of the qualifying features; and</p> <p>The distribution of the qualifying features within the site.</p>	<p>The Morecambe Bay and Duddon Estuary SPA comprises six component SSSIs the condition of which are summarised below.</p> <p>Duddon Estuary SSSI: The most recent condition assessment has resulted in the following summary of the component units: favourable 94.36%, unfavourable recovering 4.12%, unfavourable no change 1.47%. The recovery of the site has been attributed to changes in the grazing regime and reduced vehicular access to some parts of the site.</p> <p>Morecambe Bay SSSI: The most recent condition assessment has resulted in the following summary of the component units: favourable 94.31%, unfavourable recovering 5.69%. The site is mostly in favourable condition or is recovering.</p> <p>Lune Estuary SSSI: The most recent condition assessment has resulted in the following summary of the component units: favourable 100%.</p> <p>Roudsea Wood & Mosses SSSI: The most recent condition assessment has resulted in the following summary of the component units: favourable 2.38%, unfavourable recovering 56.51%, unfavourable declining 46.10%. Where unfavourable condition has been identified this has been attributed to woodland</p>	<p>Loss or disturbance of the qualifying habitats.</p> <p>Direct impacts on qualifying features, e.g. dredging.</p> <p>Indirect impacts on qualifying species, e.g. pollution.</p> <p>Deterioration of water quality.</p> <p>Increased aerial deposition of pollutants.</p> <p>Inappropriate site management including grazing.</p> <p>Inappropriate riparian land management, including fertilizer and pesticides.</p>

Site Name	Qualifying Features	Conservation Objectives	Condition Assessment	Vulnerabilities
	<p>Curlew <i>Numenius arquata</i>; Pintail <i>Anas acuta</i>; Turnstone <i>Arenaria interpres</i>; Redshank <i>Tringa totanus</i>; and Lesser black-backed gull <i>Larus fuscus</i>. During the breeding season the site regularly supports: Lesser black-backed gull <i>Larus fuscus</i>; and Herring gull <i>Larus argentatus argentatus</i>. The site also qualifies under Article 4.2 of the Directive (2009/147/EC) as it supports an internationally important assemblage of over 20,000 seabirds in any season, including: Herring gull <i>Larus argentatus argentatus</i>, lesser black-backed gull <i>Larus fuscus</i>, sandwich tern <i>Sterna sandvicensis</i>, common tern <i>Sterna hirundo</i> and little tern <i>Sternula albifrons</i>. The main components of the assemblage include all qualifying features listed above, as well as the following species present in numbers exceeding 1 % of the GB total population, and/or exceeding 2,000 individuals: Great egret <i>Ardea alba</i>, Spoonbill <i>Platalea leucorodia</i>, brent goose <i>Branta bernicla</i>, wigeon <i>Anas penelope</i>, teal <i>Anas crecca</i>, green-winged teal <i>Anas carolinensis</i>, mallard <i>Anas platyrhynchos</i>, ring-necked duck</p>		<p>management and inappropriate drainage. South Walney and Piel Channel Flats SSSI: The most recent condition assessment has resulted in the following summary of the component units: favourable 91.29%, unfavourable recovering 5.99%, unfavourable no change 2.72%. The condition assessment identifies scrub control being necessary in some units. It is also suggested that recent pipeline construction may have had an effect where recovery is still ongoing. Wyre Estuary SSSI: The most recent condition assessment has resulted in the following summary of the component units: favourable 100%.</p>	

Site Name	Qualifying Features	Conservation Objectives	Condition Assessment	Vulnerabilities
	<p><i>Aythya collaris</i>, common eider <i>Somateria mollissima</i>, goldeneye <i>Bucephala clangula</i>, red-breasted merganser <i>Mergus serrator</i>, cormorant <i>Phalacrocorax carbo</i>, lapwing <i>Vanellus vanellus</i>, little stint <i>Calidris minuta</i>, spotted redshank <i>Tringa erythropus</i>, greenshank <i>Tringa nebularia</i>, black-headed gull <i>Chroicocephalus ridibundus</i>, common gull <i>Larus canus</i> and herring gull <i>Larus argentatus argentatus</i> (non-breeding).</p>			

