STEPHENSON HALLIDAY
ENVIRONMENTAL PLANNING • LANDSCAPE ARCHITECTURE

HIGH CLOSE QUARRY, NEAR COCKERMOUTH, CUMBRIA

RESUBMISSION ES

ENVIRONMENTAL STATEMENT APPENDICES

PREPARED FOR:

THOMAS ARMSTRONG AGGREGATES LTD

Workington Road
Flimby
Maryport
Cumbria
CA15 8RY

BY

STEPHENSON HALLIDAY LTD

30-32 Lowther Street
Kendal
Cumbria
LA9 4DH

FEBRUARY 2023

RESUBMISSION ES ENVIRONMENTAL STATEMENT APPENDICES:

CONTENTS

APPENDIX 1:
SCOPING OPINION AND REG 22 SCHEDULE

Scoping Opinion

THE TOWN AND COUNTRY PLANNING
(ENVIRONMENTAL IMPACT ASSESSMENT)
REGULATIONS 2011

SCOPING OPINION

BY

CUMBRIA COUNTY COUNCIL

PROPOSED APPLICATION FOR DETERMINATION OF NEW PLANNING CONDITIONS

AT

HIGH CLOSE QUARRY, PLUMBLAND, NEAR COCKERMOUTH, CUMBRIA

BY

THOMAS ARMSTRONG (AGGREGATES) LTD

June 2019

1 INTRODUCTION AND BACKGROUND

1.1 This is a Scoping Opinion adopted by Cumbria County Council, as the Mineral Planning Authority (MPA) for mineral developments, under Regulation 13 of the Town and Country Planning (Environmental Impact Assessment) Regulations 2011. It sets out the information which the MPA considers will need to be provided in the Environmental Statement (ES) to accompany a forthcoming application for the determination of new planning conditions under the Environment Act 1995. The permission which will be subject to this application is dormant mineral permission CA49, granted in December 1954 by the former Cumberland County Council, for the extraction of limestone at High Close Quarry, at Plumbland near Cockermouth in Cumbria.

1.2 Under the terms of the Environment Act 1995, minerals development cannot lawfully commence at a dormant site until an applicant has submitted an application for appropriate mineral planning conditions and these conditions have been subsequently agreed by the MPA. This is reiterated in the latest guidance on the matter contained in Paragraph 180 of the Planning Practice Guidance (dated 6 March 2014).

1.3 The planning permission for this site was included by Cumbria County Council as a dormant quarry in the *First List of Dormant Sites and Active Phase I and II Sites* document (dated January 1996), as required by the Environment Act 1995, with an expiry date of February 2042. Following the extraction of limestone, the quarry became a landfill site operated by Cumbria County Council from around 1975 to its closure in 1990. The review process enables MPAs to impose up to date conditions and working schemes on old or dormant permissions to ensure that they are subject to a modern conditions and environmental controls.

1.4 It should be noted that this Scoping Opinion is provided somewhat belatedly. Planning consultants, Stephenson Halliday, acting on behalf of their client Thomas Armstrong (aggregates) Ltd, requested a Scoping Opinion for this proposal in April 2017. As such, and in accordance with the transitional provisions introduced by the 2017 Environmental Impact Assessment Regulations, the Town and Country Planning (Environmental Impact Assessment) Regulations 2011 apply to the preparation of the Environmental Statement accompanying this application and to this Scoping Opinion.

The Site and its Context

1.5 The 49 hectare site (approximately 11.2 ha of which is the proposed extraction area along the western part of the site) is located in open countryside and the villages of Parsonby and Plumbland lie between around 185 and 300 metres to the north of the extremities of the site boundary. Access to the site would be from the B5301 on Parsonby Brow, which is approximately 1.7 km from the junction with the A595.

1.6 The closest properties are those located at Parsonby and Plumbland and closer still are High Close located immediately on the north east boundary of the site, Parsonby Farm on the southernmost edge of Parsonby and Adams Gill on the southern edge of Plumbland. A public footpath (FP 248019) is located along the north east boundary of the site, linking property of High Close to the villages of Parsonby and Plumbland. More extensive public footpath networks exist further north around Parsonby and Plumbland, further south at Moota Hill and further east around Bothel.

1.7 The site lies approximately 1.3 km to the north west of Clints Quarry Special Area of Conservation (SAC), a disused limestone quarry designated due to its large and exceptional population of Great Crested Newts and associated habitat of quarry spoil, early successional vegetation and surrounding pasture. Three other species of native amphibian are also found on this site, consisting of populations of palmate newt and low populations of common frog and common toad. Clints Quarry is also a designated Site of Special Scientific Interest (SSSI). Adjacent to this is Clints Craggs SSSI. Wardhall Quarries County Wildlife Site, noted for the presence of UK Priority Habitat hay meadows and pastures lies approximately 280 metres to the west of the site. Approximately 3.7km to the south of the site is the River Derwent and Bassenthwaite Lake SAC, which is also designated as River Derwent and Tributaries SSSI, and approximately 2.9m to the south is Gill Beck SSSI.

1.8 The Lake District National Park is located approximately 1.1km to the south east of the site. In terms of landscape character, the National Landscape Character Areas in the vicinity of the site include Area 6: Solway Basin, Area 7: West Cumbria Coastal Plain, and Area 8 Cumbria High Fells; the Local Landscape Character Types and Sub Types in the vicinity include Landscape Character Type 12: Higher Limestone (Sub-type 12b: Rolling Fringe) and Landscape Character Type 5: Lowland (Sub-type 5a: Ridge and Valley) (Cumbria Landscape Character Guidance and Toolkit, March 2011), and Landscape Character Type H: Upland Valley, Landscape Character Type I: Upland Limestone Farmland, and Landscape Character Type J: High Fell Fringe (Lake District National Park Landscape Character Assessment and Guidelines, 2008).

1.9 The proposed extraction area contains the remains of potentially significant archaeological assets. Aerial photos show that the buried remains of an Iron Age/Romano-British enclosure are located on the site. An asset from the same period, and of a similar type, is located 300 metres beyond the proposed extraction area and this is designated as a Scheduled Monument (No. CU203). The remains of the Iron Age/Romano-British enclosure located within the site may therefore be of an equivalent significance as the nearby designated asset.

1.10 The site is located within an Area Susceptible to Groundwater Flooding, designated by the Environment Agency. The site is entirely within in Flood Zone 1 (lowest risk of surface water flooding - less than 1 in 1,000 (0.1%) annual probability of river or sea flooding in any given year).

1.11 The Bothel/Derwent Park major gas pipeline, operated and managed by Northern Gas Networks Ltd, crosses the site and potential quarry area in a ENE to WSW direction. The presence of this pipeline is a potential constraint to the development, with the potential to sterilise a significant amount of limestone reserve.

1.12 The former quarry operating at this site became a landfill site, which operated from 1975 until its closure in 1990. In addition, a former waste landfill site at Parsonby Pond is located approximately 300 metres to the north of the site boundary.

The Proposal

1.13 Geological appraisal and site investigations in early 2011, and more latterly during late 2016 and early 2017, has revealed a geology in this area of West Cumbria comprising a group of limestones within the Carboniferous Limestone Series separated by sandstones and shales. In general, the sequence of rock dips or slopes around 6 to 10 degrees to the west or north-west and is subject to block faulting. The appraisal and site investigation work identified a potential reserve of limestone of some 5 million tonnes which the applicant considers to be commercially and economically viable to work.

1.14 There are two main options to develop the quarry: from the north or from the south. For reasons relating to landscape impacts and reserve potential, it was concluded that the better option would be to work in a north to south direction in two distinct phases, the first to the north and the second to the south of the existing gas pipeline that currently bisects the site. The proposal includes an assumption that the gas pipeline will be diverted to allow the full extraction of the limestone reserve. The site has the potential to be worked to a depth of 113 meters AOD.

1.15 It is proposed that the storage, stockpiling and processing area would be located in the north eastern part of the site. The site would also house a site office and weighbridge. It is noted that the original Scoping Report proposed a ready mix concrete plant to be located on the site. This is no longer part of the proposal and would need to be the subject of a separate planning application in any event.

1.16 The scheme would involve the partial removal of existing woodland along the western boundary of the site in order to enable the full extent of the initial phase to be worked. Screening bunds and woodland planting is also proposed along the northern boundary as compensation and along the western and southern boundaries specifically to screen the stockpiling and processing area. The site would be progressively restored with further native tree, shrub and hedge planting, together with the creation of agricultural grassland, calcareous grassland with intermittent areas of bare rock, and ephemeral waterbodies with marginal aquatic vegetation.

1.17 The proposed access off Parsonby Brow would be a new site access, again outside the scope of this review application and, as such, the subject of a separate planning application.

2 STATUTORY REQUIREMENTS

2.1 As this proposal is to re-open a currently dormant quarry, it would fall within Schedule 2 Paragraph 2(a) of the Town and Country Planning (Environmental Impact Assessment) Regulations 2011 (the Regulations).

2.2 Schedule 4 of the Regulations sets out the information that the ES must contain. This includes a description of the aspects of the environment likely to be significantly affected by the development, including in particular, population, fauna, flora, soil, water, air, climatic factors, material assets including archaeological heritage and landscape. It also sets out, in more general terms, the information that may reasonably be required to assess the environmental effects of a proposed development, and states that the direct, indirect, secondary, cumulative, short, medium and long-term, permanent and temporary, positive and negative effects of the proposals should be assessed. A non-technical summary, and an outline of the main alternatives considered by the applicant must also be included.

2.3 The emphasis of Schedule 4 is on the "main" or "significant" environmental effects. Impacts which have little or no significance for the particular development in question will need only brief treatment to indicate that their possible relevance has been considered.

2.4 Under the terms of the Regulations, a planning authority shall not adopt a Scoping Opinion until it has consulted those bodies that would have been required to be consulted had a planning application for the development been submitted. This is to give the consultation bodies the opportunity to identify significant environmental effects and any other issues which they consider the applicant should address.

2.5 In this case the County Council has consulted a number of bodies including Allerdale Borough Council (Planning and Environmental Health), the Environment Agency, Natural England, Cumbria County Council (as Highways and Lead Local Flood Authority), the Health and Safety Executive, Northern Gas, Cumbria Wildlife Trust and Plumbland Parish Council. A full list of consultees is provided in Appendix A, together with responses received.

2.6 The Regulations (Regulation 13(9)) provide that a planning authority shall not be precluded, after a scoping opinion has been adopted, from requesting additional information from an applicant once the relevant application and ES have been submitted.

3 THE SCOPING OPINION

3.1 Schedule 4 of the Regulations sets out the general information that should be included in an ES. This Scoping Opinion has taken this into account, together with the content of the Scoping Report prepared by Stephenson Halliday (dated April 2017) on behalf of Thomas Armstrong Ltd. and the consultation responses received.

3.2 It is Cumbria County Council's opinion that the following information should be provided in the ES.

The Site, its Location and the Proposal

3.3 The ES should include a description of the existing site and surroundings. This should include distances from the boundary of the application site to residential and other developments; to identified areas and designated sites of environmental and nature conservation interest; to recreational areas and rights of way, watercourses, other water bodies and agricultural land and its location in relation to road networks. This should be followed by a detailed description of the proposed development. The development proposal (including the proposed hours of operation) should be set out in sufficient detail to allow a full assessment of all the likely environmental effects.

3.4 The description of the proposal should include full details of all proposed on-site activities, including all processing activities, plant and machinery; stockpiling areas (location, heights, phasing); soil storage areas; proposals for managing quarry waste; proposals for managing water/hydrology on the site; the location and scale/dimensions of the site office and weighbridge, and all internal access roads.

3.5 The ES should identify and assess the proposed restoration, both phased during the operation of the site, and following cessation of mineral extraction. The proposals as a whole should look to secure appropriate environmental benefits (potentially both on and off-site), and demonstrate how the proposals accord with NPPF and local planning policies. The ES must assess the impacts of all elements of this proposal.

Public Consultation

3.6 The applicant has already been actively engaged in pre-application discussions with the planning authority and key stakeholders.

3.7 In accordance with the County Council's *Statement of Community Involvement* (adopted July 2017), it is expected that the developer will have carried out an exercise of pre-submission publicity and consultation with the local community on the proposed development prior to submitting the planning application. It is also expected that the planning application will include details of the publicity and consultation and the issues and aspirations that were raised, and that the applicant will demonstrate within the ES how these have been addressed.

Alternatives

3.8 An outline should be provided of the main alternatives to the proposed scheme that have been considered. This should include an indication of the main reasons for the choices made, taking into account the environmental effects.

3.9 A description of the alternative sites considered and the community consultation and other factors which led to the selection of the proposed site, and the decision to work the site on a north to south basis, should form part of the ES. It should also include consideration of alternative methods of working and operating the site, transporting the material from the site, and layouts and designs of the site. A "do nothing" baseline option should form part of the assessment of alternatives.

3.10 The main reasons for Thomas Armstrong's selection should outline clearly how environmental factors were taken into account as part of the decision making process.

Cumulative and in-combination effects

3.11 The ES should identify, describe and evaluate all of the effects or impacts that are likely to result from the proposed development as a whole, in combination with the other activities that are being, have been or will be carried out in the vicinity of the site. Subject to information being available, the following types of projects should be considered in such an assessment:

- Existing development;
- Approved but uncompleted development;
- Development under construction;
- Plans or projects for which an application has been made and which are under consideration by the consenting authorities (including Allerdale Borough Council, Cumbria County Council, and the Environment Agency); and
- Plans and projects which are reasonably foreseeable; that is, plans or projects for which an application has not yet been submitted, but which are likely to progress before completion of the development and for which sufficient information is available to assess the likelihood of cumulative and in-combination effects.

Planning and Land Use Policy

3.12 Whilst not required to be included as part of the formal Environmental Statement, the development should be assessed as to its conformity to national and local planning policy. Such assessment should be undertaken within a separate Planning Statement to be provided as part of the application.

3.13 In the national policy context, the *National Planning Policy Framework* contains policies of relevance to this proposal. Reference should also be made to the *Planning Practice Guidance*. *The National Planning Policy Framework* (NPPF) was first published on 27 March 2012 and since then has been continually updated. The national online *Planning Practice Guidance* (PPG) suite was launched in March 2014 and is also regularly updated. Both are material considerations in the determination of planning applications.

3.14 The development site lies within the administrative area of Allerdale Borough Council (ABC). Cumbria County Council is the Mineral Planning Authority. The development plan for this application, setting out the local planning policy comprises:

- the Cumbria Minerals and Waste Local Plan 2015-2030 (CMWLP) - adopted on 6 September 2017, and
- *Allerdale Local Plan Part 1: Strategic and Development Management Policies 2014-2029 (ALP Part 1) - adopted July 2014;*
- The saved policies of the *Allerdale Local Plan 1996-2006 - adopted November 1999*.
- *Allerdale Borough Council Local Plan (Part 2): Site Allocations Development Plan* Document . The adopted (July 2014) version of this plan will be superseded in due course by an updated version of this document. The Examination of the updated or 'Submission' version of this document by an independent Planning Inspector has recently taken place (May 2019) and the outcome is awaited.

3.15 There are several policies of relevance to this application. These include, for example, NPPF Section 17 (*Facilitating the use of minerals*), particularly paragraphs 205 and 207.

3.16 As well as national policy, local policies of relevance and against which the proposal would have to be assessed include in particular CMWLP Strategic Policies SP1 (Presumption in favour of sustainable development)), SP13 (Climate change mitigation and adaption) SP14 (Economic Benefit), SP15 (Environmental assets), SP16 (Restoration and aftercare), and Development Control Policies DC1 (Traffic and Transport), DC2 (General Criteria), DC3 (Noise), DC4 (Quarry Blasting), DC5 (Dust), DC6 (Cumulative Environmental Impacts), DC12 (Criteria for non-energy minerals development), DC14 (Review of Mineral Permissions), DC16 (Biodiversity and geodiversity), DC17 (Historic environment), DC18 (Landscape and visual impact), DC19 (Flood risk), DC20 (The water environment), DC21 (Protection of soil resources), DC22 (Restoration and aftercare).

Transport, Highways and Rights of Way

3.17 Historically, access to the site was from the A595, then the B5301 to the north western part of the site. Advice received from County Highways, however, concluded that use of this would be unacceptable and an alternative was discussed directly with the applicant and subsequently agreed as being more acceptable, which, as indicated above, would need to be the subject of a separate planning application.

3.18 The proposal anticipates that vehicle numbers would be an average of 40 loads per day and travel north via the B5301 or south via the B5301 to the A595. Use of a new access with the proposed traffic movements would require the submission, though the Environmental Statement, of a Transport Assessment, prepared in consultation with the County Council as Local Highway Authority and following the guidance set out in the *Planning Practice Guidance – Travel Plans, Transport Assessments and Statements* (published March 21014).

3.19 The Transport Assessment should include the following:

- Assessment of the existing conditions, including the condition of the site access, the highway network in the vicinity of the site, including construction routes to the site, and a review of accident data within the vicinity of the site access, as agreed with the Local Highway Authority and Highways England;

- Consideration of historic, existing and future trips;

- A quantitative assessment of the impacts of the development on the strategic and local highway network, including a capacity analysis and an analysis of traffic flows. This should include traffic generation for the construction and operational phases of the development;

- The identification of any necessary measures to mitigate the impacts of quarry traffic on the local road network;

- Measures to maximize the potential for other modes of transport to access the site; and

- Assessment of the transport impacts of the development in-combination with other projects in the vicinity of the site.

3.20 The ES would need to review any potential impacts of the proposal on the rights of way and other recreational routes (or open access land) in the vicinity of the site.

Archaeology and Cultural Heritage

3.21 The site itself contains the remains of an Iron Age/Romano-British enclosure, and there is a designated Schedule Monument in the vicinity. The proposal therefore has the potential to disturb assets of significance and unknown assets. As such, the Environmental Statement will need to include an assessment of how any archaeological assets would be impacted upon. An archaeological desk-based assessment would be necessary, together with an archaeological geophysical survey of the areas of the site that have not been subject to previous extraction. This would enable an informed judgement to be made as to whether provisions would need to be included for the preservation of significant archaeological assets in situ and for the recording of assets of lower importance.

3.22 It is recommended that Cumbria County Council's Historic Environment Officer be contacted to agree the detailed scope of the archaeological assessment.

Landscape and Visual Impact

3.23 The ES must include a full landscape and visual impact assessment (LVIA), undertaken in accordance with current guidelines and best practice and in particular, the methodology set out in the *'Guidelines for Landscape and Visual Impact Assessment* 3rd Edition, Landscape Institute and Institute of Environmental Management and Assessment 2013. This should include an assessment of the operational and residual impacts of the continued working of the site upon visual receptors and the site and surrounding landscape.

3.24 Consideration should be given to the guidelines set out in the *Landscape Character Guidance and Toolkit* (Cumbria County Council; March 2011) – to ensure that the proposals are consistent with the types of landscape enhancements expected in this area.

3.25 The scope and visual effects assessment should focus on the visual experience of people viewing the landscape, informed by examination of an agreed selection of representative viewpoints. An appropriate study area should be adopted. The Scoping Report indicates the proposed development is not within any protected landscape area, but is near to residential settlement and public access routes, including roads and public footpaths as well as the Lake District National Park (LDNP).

3.26 It is considered that the LVIA should consider the following as a minimum:

- All potential effects upon the landscape character and visual receptors;
- Effects during construction, operation, decommissioning and post restoration; and
- Planting over the life of the proposal, setting out landscape parameters for decommissioning and landscape restoration, and identifying related landscape and visual effects.

3.27 It is advisable to agree the baseline for the assessment of potential landscape and visual effects, the study area for these effects, the Zone of

Theoretical Visibility, representative viewpoints, and the scope of assessment and methodology with Cumbria County Council prior to preparing the ES.

3.28 Consideration will need to be given in the Environmental Statement to the potential cumulative and in-combination landscape and visual effects of this proposal in addition to other developments in the vicinity of the site.

Ecology and Nature Conservation

3.29 It is noted that an initial ecological assessment accompanied the Scoping Report submitted by the applicant in April 2017. Further advice on the scope of the Environmental Statement has since been provided by the County Council's consultant ecologists, Simply Ecology (see Appendix 1).

3.30 In general terms it is advised that the submitted Environmental Statement demonstrates a rigorous and transparent approach to impact assessment which is in accordance with CIEEM Guidelines for Ecological Impact Assessment in the UK and Ireland (fully referenced below). A key element in following these guidelines is the establishment of the ecological baseline for the site. In addition to the habitat surveys undertaken so far, it is advised that further surveys, in the form of breeding and wintering bird surveys, including for barn owls, and bat surveys should be undertaken, all in accordance with the required standards and best practice.

3.31 Within the baseline conditions, the Environmental Statement will also need to identify important ecological features that are and could potentially be impacted by the proposals. The Zone of Influence (ZoI) of the proposal upon the various important ecological features must be identified (drawing upon best available evidence to identify these), and there should be a clear characterisation of the nature of any impacts, and importantly, whether these are significant.

Internationally and Nationally Designated Sites

3.32 As indicated above, there are European and Nationally significant designations in the vicinity of the site.

3.33 The ES should consider the temporary, short term, long term, residual and cumulative impacts of the proposals on all such designations in the vicinity of the site and determine the potential pathways for impact, such as through discharges to air or water (either as part of this section or elsewhere in the document in sections relating to air quality, hydrogeology etc.). Mitigation measures as may be required to avoid, minimise or reduce any adverse effects should also be identified. A starting point for these considerations should be the Conservation Objectives for the designated sites as the proposals will have to be assessed against these.

3.34 Regulation 63 of the Conservation of Habitats and Species Regulations 2017 requires an appropriate assessment to be carried out in respect of any plan or project which is likely to have a significant effect on a European site (either alone or in combination with other plans or projects) and is not directly connected with or necessary to the management of the site. In this case, should a Likely Significant Effect on the SAC be identified or be uncertain, Cumbria County Council (as the Local Planning Authority and the 'competent authority') may need to prepare an Appropriate Assessment. The ES must include sufficient information to enable Cumbria County Council to undertake an 'assessment of likely significant effect' in the first instance and an 'appropriate assessment' if necessary, under the Regulations.

Regionally and Locally Important Sites

3.35 The ES would need to consider any impacts upon the local wildlife and geological sites, such as the County Wildlife Sites, in the vicinity. An assessment of the likely impacts on the wildlife and geodiversity interests of these sites should be presented, together with proposals for mitigating any impacts and compensation measures if appropriate.

Protected Species

3.36 In general terms, the ES should assess the impact of all phases of the proposal on the protected species in the vicinity of the site. These are species protected by the Wildlife and Countryside Act 1981 (as amended) and by the Conservation of Habitats and Species Regulations 2017, and include, Great Crested Newts, reptiles, birds, water voles, badgers and bats. Records of protected species should be sought from the local record centres, such as Cumbria Biodiversity Data Centre, and nature conservation organisations and consideration should be given in the ES to enhancing habitat linkages and protected species populations in the wider area.

3.37 The area likely to be affected by the proposal should be thoroughly surveyed by a suitably qualified and, where necessary, licensed ecological consultant and at the optimal time of the year. It is noted that several surveys have already been undertaken. The survey results, impact assessments and accompanying mitigation strategies should be included within the ES. Guidance on surveys and mitigation is available from the Standing Advice provided on Natural England's website.

Habitats and Species of Principal Importance

3.38 The ES should assess the impact of the proposals on habitats and/or species listed as 'Habitats and Species of Principal Importance' within the England Biodiversity List, published under the requirements of Section 41 of the Natural England and Rural Communities (NERC) Act 2006. Consideration should also be given to those species and habitats included in the Cumbria Biodiversity Action Plan.

3.39 Habitat surveys equivalent to Phase 2 should be carried out to identify the presence of such species and habitats, and the ES should include details of historical data; all surveys carried out; the habitats and species present and their status; the direct and indirect effects of the proposals upon the habitats and species, and details of any proposed mitigation or compensation that may be required. Information on such habitats and species can be sought from the Cumbria Biodiversity Data Centre.

Habitat Creation and Biodiversity Enhancement

3.40 The ES should include an assessment of the proposal upon features of nature conservation interest and identify opportunities for habitat creation and biodiversity enhancement, and minimising impacts on and providing net gains for biodiversity. As indicated above, this should be in accordance with the Guidelines for Ecological Impact Assessment (EcIA) developed by the Chartered Institute of Ecology and Environmental Management (CIEEM) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater and Coastal 2nd Edition (Jan, 2016), and in accordance, in particular, with Paragraphs 170 and 175 to 177 of the NPPF (February 2019) and the Cumbria Minerals and Waste Local Plan (September 2017) Strategic Policies SP15 and SP16 and Development Control Policy DC16.

Hydrology and Hydrogeology

3.41 The site is located within Flood Zone 1 and the site itself (far) exceeds1 hectare in size. Following the *Planning Practice Guidance,* a Flood Risk Assessment would be required. A former landfilled quarry is also located on the site.

3.42 The Environment Agency has provided extensive advice (11 May 2018 and 3 August 2018 – see Appendix 1) on the scope of the forthcoming Environmental Statement. It is advised that the advice and requirements provided by these detailed responses is followed by the applicant in preparing the Environmental Statement and that the applicant liaises closely with the Environment Agency during this process.

3.43 In summary, it is recommended that the following is carried out and findings presented as part of/in order to support the Environmental Statement:

- A Geological/Geotechnical and Hydrogeological Appraisal;
- A review of the impact of blasting on fractures/fissures in the geological beds and the impact (if any) on the nature and volume of groundwater flows;
- An Hydrogeological Risk Assessment;
- Further information on the landfill site, to include landfill drainage and samples; information regarding leachate monitoring and control, and information site/ground investigation and risk assessment of the landfill site (with the potential for the status of

the landfill site to be contaminated land under EPA1990 Part 2A;

- A Hydrological Impact Assessment, to include a water features survey; details of the existing topography and drainage network of the site; records of the natural variation (to include the highest) in the water table across the proposed development (at least 2 years of monitoring data from monitoring boreholes); geological plans and cross-sections showing the three dimensional relationship between aquifers and the highest natural water levels within the existing topography, the proposed lowest excavation surface and the proposed final restoration surface; all levels on the logs, plans and water levels to be related Ordnance Datum; and a water management plan, to include potential mitigation measures to manage the potential inflow of contaminated water/leachate from the adjacent landfill.

Operational Impacts – Noise, Dust and Blasting

Noise

3.44 Noise could be generated from fixed or mobile sources in respect to the operation of the site, as well as the movement of vehicles accessing the site via the local roads.

3.45 As previously highlighted the site is located in close proximity to residential properties; however, the applicant advises that the closest property, High Close Farm, is unoccupied and owned by the applicant

3.46 It is considered that a Noise Impact Assessment should be undertaken and presented in the ES to ensure that, should planning permission be granted, limits imposed would be appropriate. The noise impact assessment should be consistent with the NPPF Technical Guidance, the guidelines given in the Planning Practice Guidance (February 2019) *"Assessing environmental impacts from minerals extraction" Paragraph 019 and the IEMA document "Guidelines for Environmental Noise Impact Assessment".* The assessment should include the following:

- The identification of a number of sensitive receptors relative to the site (i.e. residential properties, farms etc.), to be agreed with the Local Planning Authority;

- Background noise monitoring to establish the baseline situation;

- The determination of appropriate noise limit criteria in accordance with paragraphs 021 and 022 of the *Planning Practice Guidance* (February 2019) and agreed with the Local Planning Authority;

- Identification and assessment of noise generating activities throughout the operation of the site to include; traffic movements to, from and within the site; soil-stripping; construction of soil mounding and bunding; operational mobile plant and any fixed plant; and mineral extraction itself;

- Calculation of predicted noise levels using computer modeling;
- An assessment of the predicted noise levels against the agreed noise limits to determine the significance of the impacts;
- Identification of mitigation measures to address any significant impacts, and
- Proposals for the monitoring and review of noise emissions to ensure compliance with agreed limits, and procedures to be followed should complaints be received.

Air Quality

3.47 The ES should include a dust and air quality assessment which should include:

- The identification of existing baseline conditions. It should include identifying the principal existing dust sources other than the site (such as dust/air pollution from agricultural or construction activities), including PM10 and PM2.5 background levels; identifying the location of dust sensitive land users (including residential properties and ecological interests in the locality); consideration of how topography may affect the emission and dispersal of site dust; and consideration of how climate and in particular the prevailing meteorological conditions could influence patterns of dispersal;
- A review of any complaints relating to the area, received by Cumbria County Council and Allerdale Borough Council's Environmental Protection Department), and a review of existing dust or particulate monitoring data;
- The identification of on-site dust sources and an assessment of their potential to emit dust (without mitigation in the first instance) with respect to the duration of the activity and/or the potential of the dust to become airborne;
- An assessment of how the sensitive land uses could be affected by dust from onsite activities, taking into account the information collated in the three stages above. Computer modelling techniques or professional judgement could be used to make this assessment;
- Proposed mitigation measures and site design modifications. Measures to control dust should be specified and their potential to reduce dust and consequent impacts should be explained.

3.48 The potential impacts upon human health relating to the potential release of particulate (PM10 and the finer PM2.5) air pollution should be assessed and mitigated if necessary.

3.49 Proposals for the future monitoring of dust to enable the effectiveness of control mechanisms to be reviewed and dust mitigation measures to be modified should be presented. The air quality assessment should not only consider the potential for nuisance dust but also any relevant pollutants covered in the National Air Quality Strategy.

Blasting and Ground Vibration

3.50 The Environmental Statement should include an assessment of the effects arising from quarry operations in relation to ground vibration and air overpressure from blasting. The Statement should describe the methodology used for carrying out the assessments, explain what alternative methodologies were available and give reasons for use of the chosen methodology and for the rejection of alternatives. The Statement should also propose mitigation and remediation measures for any adverse impacts identified.

Slope (and Tip) Stability

3.51 The Environmental Statement should identify and assess the issue of quarry slope (and tip) stability, particularly given the presence of the former landfill site. The appraisal should address the potential for instability and possible impacts upon neighbouring land uses and land users both during the working and restoration of the site and in the long term when quarrying has ceased and the site has been restored and returned to the proposed afteruse.

3.52 The appraisal should be based on existing information, which aims as a minimum to:

- Identify any potential hazard to people and property and assess its significance;
- Establish the basis for reserve calculation, and
- Identify any features which could adversely affect the stability of the workings to enable this to be considered/mitigated in the quarry design.

Health

3.53 It is advised that the Environmental Statement considers the potential impacts and effects on human health, to include an assessment of both the positive and negative and direct and indirect impacts on public health. It is considered that a stand-alone chapter would not be necessary in respect of this and instead it is suggested that consideration of the implications of the proposal upon human health is embedded within relevant topic areas such as air quality, noise and vibration. The assessment should take into account perceptions of the proposals, particularly the potential for local people to be concerned about the impacts of the development. Each topic section should state the any mitigation proposals to address identified impacts on human health, and provide for the monitoring of these impacts.

Climate Change

3.54 The 2011 EIA Regulations require the proposal to be assessed in relation to climatic factors. Considerations relating to climate change are becoming increasingly high on the policy agenda. It is advised that the Environmental Statement includes consideration of the impact of the proposals on climate (for example the nature and magnitude of greenhouse gas emissions) and the vulnerability of the project to climate change (a requirement under the 2017 EIA Regulations).

3.55 It is considered that a separate stand-alone chapter is not necessary in respect of this, provided such climate change considerations are embedded within the relevant topic areas. The hydrological, flood risk and ecological implications of the project should, for example be considered in the context of climate change, together with any implications for the design of scheme. The scope and assessment should follow the principles and guidance provided by IEMA (Institute of Environmental Management and Assessment) in relation to Climate Change Adaption and EIA). Assessment should identify potential impacts/effects and adaptations incorporated into the proposal to make it more resilient to climate change.

Community, Social and Economic Impacts

3.56 The Environmental Statement should assess the potential impacts (positive and negative) which the development may have on the socio-economic character of the area. Particular consideration should be given to the employment issues related to the development and the potential impacts upon local residential amenity.

Proviso

3.57 This Scoping Opinion relates solely to the development as outlined and described within the submitted Scoping Report received in April 2017. If subsequent changes are proposed to the scheme prior to submission of a planning application to the Local Planning Authority following the adoption of this Scoping Opinion, it may be necessary to request a further Scoping Opinion from the Local Planning Authority.

Signed: Angela Jones,
Acting Executive Director for Economy and Infrastructure
on behalf of Cumbria County Council

Dated: 7 June 2019

APPENDIX 1

CONSULTATION RESPONSES RECEIVED

1. Allerdale Borough Council – Planning
2. Allerdale Borough Council – Environmental Protection
3. Plumbland Parish Council
4. Gilcrux Parish Council
5. Aspatria Parish Council
6. Cumbria County Council – Highway Authority and Lead Local Flood Authority
7. Cumbria County Council – Historic Environment
8. Cumbria County Council's Ecological Advisors – Simply Ecology
9. Environment Agency
10. Northern Gas
11. NATS – Safeguarding

Note: The following were consulted, but no responses were received.

- County Councillor – Bothel and Wharrels
- Cumbria County Council – Countryside Access
- Natural England
- Health and Safety Executive
- Coal Authority
- Cumbria Wildlife Trust

Development Control - Planning Dept address

From: Brook, Sara [redacted]
Sent: 12 May 2017 11:54
To: Development Control - Planning Dept address
Subject: FAO: Mrs Rachel Brophy - High Close Quarry, Plumbland, Aspatria, Cumbria

Dear Rachel,

Further to the comments below from Environmental Health, we are satisfied with the topic areas suggested to be scoped in to the ES as set out within the Stephenson Halliday Scoping Report, the detail of which will be subject to advice from technical consultees.

Regards,

Sara Brook

From: Copeland, David
Sent: Friday, May 12, 2017 11:46 AM
To: Brook, Sara
Subject: Allerdale BC Environmental Health Scoping Opinion Consultation- High Close Quarry, Plumbland, Aspatria, Cumbria

Hi Sarah, High Close Scoping opinion

David Copeland
Environmental Health Officer (Environmental Protection)
Housing and Health Services

Allerdale Borough Council, Allerdale House, Workington, Cumbria, CA14 3YJ

[redacted]
W: www.allerdale.gov.uk

Making Allerdale a great place to live, work and visit
Please consider the environment - do you really need to print this email?

From: Copeland, David
Sent: Tuesday, May 09, 2017 4:42 PM
To: 'developmentcontrol@cumbria.gov.uk'
Cc: Environmental Health
Subject: Allerdale BC Environmental Health Scoping Opinion Consultation- High Close Quarry, Plumbland, Aspatria, Cumbria

Response to April 2017 Scoping Opinion Report for High Close Quarry

Allerdale Environmental Health would support the provision of the following findings and mitigation measures as part of the Environmental Statement for noise, dust, air quality and blast vibration, to ensure that the amenity of the area is protected.
As referred to in the scoping report all investigatory work shall be undertaken in line with recognized national or international standards and cover aspects identified within the Planning practice guidance for minerals 2014.

Regards

David

Allerdale Borough Council
Allerdale House, Workington, Cumbria, CA14 3YJ

Follow us on:
Web: http://www.allerdale.gov.uk
Twitter: http://twitter.com/allerdale
Facebook: http://www.allerdale.gov.uk/facebook

Download our new app, **myAllerdale**, from the Google Play, Apple and Microsoft stores. Report problems, find information and access our services. Or see our website for details: http://www.allerdale.gov.uk/contact-or-find-us/myallerdale.aspx

Development Control - Planning Dept address

From: Copeland, David [redacted]
Sent: 09 May 2017 16:42
To: Development Control - Planning Dept address
Cc: Environmental Health
Subject: Allerdale BC Environmental Health Scoping Opinion Consultation- High Close Quarry, Plumbland, Aspatria, Cumbria

Follow Up Flag:
Flag Status:

Response to April 2017 Scoping Opinion Report for High Close Quarry

Allerdale Environmental Health would support the provision of the following findings and mitigation measures as part of the Environmental Statement for noise, dust, air quality and blast vibration, to ensure that the amenity of the area is protected.
As referred to in the scoping report all investigatory work shall be undertaken in line with recognized national or international standards and cover aspects identified within the Planning practice guidance for minerals 2014.

Regards
David

David Copeland
Environmental Health Officer (Environmental Protection)
Housing and Health Services

Allerdale Borough Council, Allerdale House, Workington, Cumbria, CA14 3YJ

T[redacted]
W: www.allerdale.gov.uk

of Information Act 2000. Unless the information requested is exempt from disclosure, we cannot guarantee that we will not pro vide all or part of this email to a third party making a request for information.
This footnote also confirms that this email message has been swept for the presence of computer viruses.

WARNING: Email attachments may contain malicious and harmful software. If this email is unsolicited and contains an attachment **DO NOT** open the attachment and advise the ICT Service Desk immediately. Never open an attachment or click on a link within an email if you are not expecting it or it looks suspicious.

PLUMBLAND PARISH COUNCIL

Trevor Gear

Clerk

Brandraw Mount

West Street

Aspatria

CA7 3HG

Tel: [redacted]

e-mail: [redacted]

website: www.plumbland.org

14th May 2017

Dear Sirs

<u>Town and Country Planning (Environmental Impact Assessment) Regulations 2011 – Consultation on a request for a Scoping Opinion - High Close Quarry, Plumbland</u>

Further to you e-mail and attachment received on 28th April 2017 respecting the above.

These proposals have very wide ranging consequences for the local community. Plumbland Parish Council have several serious concerns regarding the proposal which includes but is not exclusive to those listed below: -

Consultation Time

Plumbland Parish Council ("the Council") meets bi-monthly and do not consider that they have had sufficient time to fully consider this application which was received on Friday 28th April and requires a response by 19th May. Thomas Armstrong have had several years to prepare their application and have only now taken up the offer to come and speak to the council. There has been no consultation with other councils in this area who will also be affected by this application

Traffic

Whilst in general the council is pleased that the entrance to the site is at the top of the brow they consider that all traffic serving the site should enter and leave the site via the B5301, turn left towards the A595 and that no service vehicles should be allowed through Parsonby or any of the adjacent hamlets.

If this cannot be guaranteed via a condition or S106 agreement then the parish council would look for a roundabout where the B5301 meets the Wardhall and Plumbland crossroads which would improve this junction and assist in reducing speed through Parsonby. Further junction improvements would be required at Toll Bar and a new bridge crossing over the river Ellen.

The Parish Council would also request that a permanent speed camera be installed in Parsonby as speeding is a major problem in the village and is only likely to increase with the increase of traffic.

The parish council are working with Cumbria County Council to improve road safety through Parsonby and should be consulted as part of this application.

Former use of the Site

The council is aware that part of the site was used as a land fill site and wishes to know how that land fill site was "sealed" and whether the method used is suitable to withstand the quarrying operations now proposed. Also, whether there is still methane being released from the land fill and what affect that would have blasting operations

Noise, Dust and Environmental Impact: Site Operations

There is a need for a full environmental survey of the proposed quarrying site and environs so that minimum impact is made on the habitat and breeding sites (and seasons) of protected species. Such survey should be undertaken by experts who are in no way connected to the Thomas Armstrong Group

The council considers that site operations should be restricted 8am – 5pm Monday to Friday with no working on the site whatsoever on Saturday, Sunday or Bank Holidays. Noise from the site including blasting must be controlled by dB(A) rating. Dust must be controlled and there should be measures to prevent contamination from vehicles leaving the site.

Ancillary Plant/Processes

It is also noted that there is a proposal for a processing plant and ready-mix concrete plant on the site which is not covered by the original permission and should be subject to a separate planning application. It is the view of the council that the use of this site should be restricted to the extraction of materials from this site with no importation of material from other sites which would increase traffic and nuisance.

Hydrology

Please see the attached letter from Dr J M Lackie. The council is also concerned that there could be changes to the water table and groundwater drainage as the result of the quarrying process. Steps must be taken to prevent run-off entering the village.

People in this and adjacent parishes are well aware of problems associated with limestone geology. There are sinkholes in many places often not immediately visible and intermittent springs lower down the hillside. There are several accounts of unexpected outcomes when development take place higher up the fells in particular the erection of the turbines at Gilcrux which undoubtedly altered spring outflows.

It is appreciated that it is difficult to predict the changes that may be caused by this development, but if they cannot be identified before the event then they need to be identified after the event and appropriate action taken. Therefore, a comprehensive and detailed description of the existing water courses and ssprings should be the absolute minimum requirement.

Of additional concern is the effect of changing water courses on the landfill site. Despite the comment in the scoping report residents claim that water from the landfill site is evident at times of heavy rain.

Nuisances/Community Concerns

The impact would be most severe at Adams Ghyll, being the nearest property to the development. It is considered that the proposal will introduce nuisances including dust, noise and vibration which must be controlled under the Environmental Protection Act 1990 and subsequent legislation.

There are many in the parish that are concerned that this proposal will severely affect the value of their homes and whilst it is accepted that generally this is not considered a planning objection, in this case it could affect the economic viability of this parish and surrounding area.

Visual Amenity

It is considered that the proposed site including the processing plant would severely affect this otherwise rural area.

Time Limit for Site Operations

Concerns have been expressed on whether there is to be a time limit on the operations on the site and whether there will be any review provision?

Community Engagement/Liaison Group

Thomas Armstrong must be made to carryout community engagement at the earliest opportunity and it is vital that there are ongoing consultations between the developer and the community in the form of a liaison group.

Financial Contribution

The parish council do not consider it unreasonable to require the developer to make funds available to the community for community projects by ways of compensation for the undoubted disturbance and nuisance that will be caused by this proposal.

The council reserves the right to make further comments on this or any subsequent application made in respect of this development when details are made known.

The council therefore require Cumbria County Council to do its duty and attach conditions on how the quarry operates and to carry out mitigation where necessary according to modern day standards to protect this rural community and its sustainability.

Yours faithfully

Trevor Gear

Clerk to Plumbland Parish Council

[redacted]

9th May 2017

Dear Sirs,

Re Scoping study for High Close Quarry

I have looked at the scoping study for the proposed limestone quarry at High Close and would like to raise a concern regarding the impact on the hydrology of the area immediately 'downstream'.

Plumbland House historically sourced its water from a spring that arises NNW of the proposed quarry (see map below) and this spring feeds a beck that runs through the grounds of the house. From a sandstone cistern near the source it still feeds a standpipe next to the stable block (which was used when mains water was unavailable during the 5-day power cut of 2009 and is still used for watering the greenhouses). It is, of course, no longer our source of drinking water.

The beck was carefully culverted through the grounds when the house was built in 1856 (it is Grade II listed) and is a distinct 'feature'. For example, near the back of the house the bed of sandstone is stepped so that the water makes a trickling sound as it flows. It also feeds a wild-life pond which we developed some 15 years ago.

My concern is that the removal or disruption of the limestone aquifer by quarrying will cause this spring to disappear (except perhaps during periods of heavy rainfall) since the reservoir of water in the Fifth Limestone will have been lost.

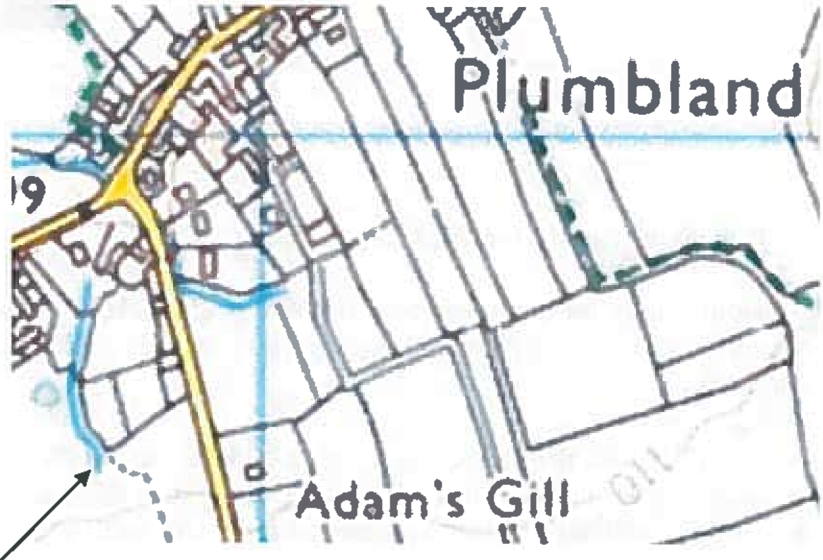
I hope my concerns will be taken into account.

Yours faithfully,

[redacted]

[redacted]

Extract of map illustrating the spring and beck referred to above:



Spring feeding beck through grounds of Plumbland House

Development Control - Planning Dept address

From: Gilcrux Parish [redacted]
Sent: 19 May 2017 19:10
To: Development Control - Planning Dept address; Brophy, Rachel
Subject: Scoping Opinion - High Close Quarry, Plumbland Ref Scoping 2017

Dear Sirs

The above has been brought to the attention of the council who adjoin the parish affected by this application.

This council wishes to record it concerns regarding the increase in HGV's using rural roads and possibly using this village as a cut through, the effects of the works on the water courses in this parish, who have first hand experience of the changes that developments can cause (Tallentire windfarm). The effects on the environment, damage to infrastructure and the ripple effect.

The council also request to advised of the progress of this application and to be consulted on any further applications respecting this site and reserves the right to make further observations as more information become known.

Regards
Trevor Gear
Gilcrux Parish Clerk

From: Helen Ostle [redacted]
Sent: 18 May 2017 12:47
To: Development Control - Planning Dept address
Subject: CONSULTATION ON A REQUEST FOR A SCOPING OPINION - HIGH CLOSE QUARRY, PLUMBLAND, CUMBRIA

FOR THE ATTENTION OF MRS RACHEL BROPHY

Aspatria Town Council met on Tuesday, 16th May, 2017 and whilst not formally consulted were concerned to hear about Thomas Armstrong's proposals in respect of High Close Quarry, Plumbland.

Aspatria Town Council is extremely concerned about any increase in traffic through the town as we already have significant problems in respect of the number of HGV timber wagons passing through on their way to Iggesund.

Aspatria is a small town and in certain areas it is not possible for two HGVs to pass at the same time due to the width of the road. There are also two schools adjacent to the road and no formal crossing. Roadside parking causes problems for residents and commuters alike.

Council would object to any service vehicles passing through Aspatria. The road from Parsonby to Aspatria is not suitable for heavy vehicles and in particular there is a single carriageway bridge. The road is often closed through the winter months due to flooding. The Council would suggest that service vehicles should enter and leave the site via the B5301 towards the A595 away from Aspatria.

The Council are concerned about noise, dust, vibration and believe there is a need for a full environmental survey of the proposed quarrying site and environs and that site operations should be restricted with no work being carried out whatsoever on weekends and Bank Holidays.

Whilst not being formally consulted, there are many implications for Aspatria as a town and the Council would like to be kept informed of developments.

Regards

Helen Ostle
Clerk
Aspatria Town Council
[redacted]

Development Control - Planning Dept address

From: Harrison, Andrew
Sent: 04 May 2017 10:19
To: Development Control - Planning Dept address
Cc: DM&LLFA West
Subject: RE: Consultation on a Request for a Scoping Opinion - High Close Quarry, Plumbland, Aspatria, Cumbria

Follow Up Flag: Follow up
Flag Status: Flagged

Dear Rachel

Having met with the applicant on site it is refreshing to see that the original access has been scrapped in favour of the documented access that was proposed during site meetings. This is welcomed.

Other observations regarding the proposals would be the management of water on and from the site once excavation/construction works for the site begins and intensification on the highway network as a result of the proposals.

It is assumed that suitable conditions will be attached to the application to mitigate these impacts.

In summary I have no objections to the proposed works.

Kind regards

Andrew

Andrew Harrison
MCIHT
Development Management officer |
Environment | Cumbria County Council |
Parkhouse Building | Kingmoor Business Park | Carlisle | CA6 4SJ
[redacted]

From: Development Control - Planning Dept address
Sent: 28 April 2017 15:29
Cc: Development Control - Planning Dept address
Subject: Consultation on a Request for a Scoping Opinion - High Close Quarry, Plumbland, Aspatria, Cumbria

Dear Sir/Madam,

Town & Country Planning (Environmental Impact Assessment) Regulations 2011

Location: **High Close Quarry, Plumbland, Aspatria, Cumbria**

Proposal: **Proposed application for the determination of conditions under the Environment Act 1995 to which the dormant minerals planning permission reference CA49 (granted permission by the former Cumberland County Council on the 8th December 1954) is to be subject. The proposal will also include an area for plant, stockpiling and storage which all relate to the quarrying of limestone. Also including a planning application for an improved site access as the former access was not considered suitable by the Highway**
Ref No: **Scoping2017**

Cumbria County Council have received a request to provide a scoping opinion in relation to the above project in accordance with the above regulations.

Please find attached a copy of the information submitted by the applicant to inform the opinion.

I should be grateful to receive any observations you may wish to make concerning the proposal so as to help inform the County Council's Scoping Opinion.

The County Planning Authority has a statutory duty to provide scoping opinions within 5 weeks of their receipt, and in order to do this it is essential that I receive prompt replies to this consultation. If you wish to comment will you therefore please do so **by 19 May 2016.** Please contact me if you require additional time to respond.

Please note that this communication is being issued via email only.

Should you have any queries as regards any of the above then please do not hesitate to contact me.

Kind Regards

Mrs Rachel Brophy BA(Hons) MA MRTPI
Planning Officer
Development Control

Environment & Regulatory Services
County Offices • Kendal • Cumbria • LA9 4RQ
Tel: [redacted] • Fax 01539 713439

Cumbria County Council

Memorandum

To: Rachel Brophy

From: Jeremy Parsons

Reference: Scoping2017

Date: 08 May 2017

High Close Quarry, Plumbland, Aspatria
Proposed application for the determination of conditions under the Environment Act 1995 to which the dormant minerals planning permission reference CA49 (granted permission by the former Cumberland County Council on the 8th December 1954) is to be subject. The proposal will also include an area for plant, stockpiling and storage which all relate to the quarrying of limestone. Also including a planning application for an improved site access as the former access was not considered suitable by the Highway
Intradepartmental Consultation – Historic Environment

Thank you for consulting me on the above scoping opinion.

The proposed extraction area contains the remains of a potentially significant archaeological asset and there is also the likelihood that additional, and currently unknown, assets of a similar date survive there. Aerial photos show that the buried remains of an Iron Age/Romano-British enclosure are located on the site. An asset from the same period, and of a similar type, is located 300 metres beyond the proposed extraction area and this is designated as a Scheduled Monument (Scheduled Monument no. CU203). The remains of the Iron Age/Romano-British enclosure located within the site may therefore be of an equivalent significance as the nearby designated asset.

I therefore consider that the proposed extraction has the potential to disturb archaeological assets of potential designatable significance and also currently unknown assets. I recommend that the forthcoming Environmental Statement includes information on how the significance of any archaeological assets that may survive within the site would be impacted upon by the development by means of an archaeological desk-based assessment and also an archaeological geophysical survey of those areas of the site that have not been subject to previous extraction . An informed judgement can be made as to whether, in the event planning consent is granted, provisions will need to be included for the preservation of significant archaeological assets in situ and for the recording of assets of lower importance.

Please do not hesitate to contact me if you wish to discuss this matter further.

Development Control - Planning Dept address

From: Jason Reynolds [redacted]
Sent: 22 May 2017 17:11
To: Development Control - Planning Dept address
Subject: RE: Consultation on a Request for a Scoping Opinion - High Close Quarry, Plumbland, Aspatria, Cumbria

Hello Rachel,
Thank you for the opportunity to provide a scoping opinion in relation to the proposed working at High Close Quarry. We have looked through the Stephenson Halliday Scoping Report, which was helpful. We note that an Ecological Assessment has been submitted as part of the scoping exercise, rather than a scoping document per se. The submitted document does not therefore really invite comment/make provision for further ecological work. This is a little 'cart before the horse'

Therefore, either informally or via the scoping response we would be grateful if you could make it clear to Stephenson Halliday that that we consider the submitted Ecological Assessment as only a preliminary piece of work, and we shall require an Environmental Statement to be submitted which is fully in accordance with Schedule 4 of the Town and Country Planning (Environmental Impact Assessment) Regulations 2017.

The submitted Ecological Assessment carries out a brief Ecological Assessment and Impact Assessment. Reference to the out-of-date IEEM guidelines for Ecological Impact Assessment is made. This is not currently in accordance with recognised industry best-practice. In order to be adequate for the purposes of the EIA we advise the applicant to submit a document that demonstrates a rigorous and transparent approach to impact assessment which is in accordance with CIEEM Guidlines for Ecological Impact Assessment in the UK and Ireland (Jan 2016).

Within the ES, the CIEEM guidance should be followed, key elements of which are: The ecological baseline for the site will need to be established. From the information submitted thusfar, we note that the scope of the existing Desk Study and Extended Phase 1 report is acceptable.
In addition to the habitat survey thusfar undertaken we also advise that breeding and wintering farmland birds surveys need to be undertaken. Specific surveys for barn owls should also be carried out. Scattered trees on the site will also require appropriate investigations in order to determine whether they have value for roosting bats and information will need to be collacted in general about the use of the site by bats, as per BCT survey guidance. The information submitted in the supporting survey reports to be in accordance with Section 6.2 onwards through to 6.13 and Section 8 of BS42020:2013 'Biodiversity - Code of practice for planning and development.'

Also within the Baseline conditions, the EIA will need to identify the important ecological features at the site. The Zone of Influence (ZoI) of the proposal upon the different important ecological features should be stated (drawing upon best available evidence to determine these) and there should be a clear characterisation of the nature of any impacts and, crucially, using a clear basis as to 8uwhether these are significant.

When making our comments upon the ES, please let teh appklicant know that we will be guided in doing so by Section 8 of BS42020:2013 'Biodiversity - Code of practice for planning and development.'
The ES should thoroughly assess the potential for the proposed development to have an impact upon designated sites, such as SSSI, SAC, SPA and draw their attention to Regulation 61 of The Conservation of Habitats and Species Regulations 2010. Again, the submitted Ecological Assessment refers to designated sites, such as Clints Quarry SAC and Moota SSSI but no periodicals, research or other evidence base is referred to. In exercising professional judgement we would expect to see inter-disciplinary cross-referencing to, for example, air quality and hydrology reports and designated site impact zones published by Natural England and some evaluation before firm conclusions can be reached.
In addition, the ES will need to provide an equally evidence based considerations any impacts upon County Wildlife Sites which are of County Importance for biodiversity.
For all Important Ecological Features, the ES should detail how the mitigation hierarchy has been followed in construction and operational phases and and will detail avoidance, mitigation, compensation and any enhancement measures for each. This will need to cover the key Habitats of Principle Importance and Species issues within the ZoI. Any ongoing Monitoring requirements in order to comply with Schedule 4 of the EIA Regulations should also be clearly advised.

Finally, we will be reviewing the findings of the ES in relation to local and national biodiversity policy context and therefore the applicant needs to take these into account when preparing the site development proposals, the application mitigation heirarchy and the final overall biodiversity assessment.

I hope that helps
If you need anything else, then please let me know
Many thanks
Jason

Jason Reynolds MSc MIEEM
Lead Ecologist

SIMPLY ECOLOGY Ecological Consultants

39 The Wheatlands, Bridgnorth,
Shropshire, WV16 5BD
&
7-2-7 Cameron House, White Cross,
South Road, Lancaster, LA1 4XF
[redacted]
simplyecology.co.uk

From: Development Control - Planning Dept address [mailto:developmentcontrol@cumbria.gov.uk]
Sent: 28 April 2017 15:29
Cc: Development Control - Planning Dept address
Subject: Consultation on a Request for a Scoping Opinion - High Close Quarry, Plumbland, Aspatria, Cumbria

Dear Sir/Madam,

Town & Country Planning (Environmental Impact Assessment) Regulations 2011

Location: **High Close Quarry, Plumbland, Aspatria, Cumbria**
Proposal: **Proposed application for the determination of conditions under the Environment Act 1995 to which the dormant minerals planning permission reference CA49 (granted permission by the former Cumberland County Council on the 8th December 1954) is to be subject. The proposal will also include an area for plant, stockpiling and storage which all relate to the quarrying of limestone. Also including a planning application for an improved site access as the former access was not considered suitable by the Highway**
Ref No: **Scoping2017**

Cumbria County Council have received a request to provide a scoping opinion in relation to the above project in accordance with the above regulations.

Please find attached a copy of the information submitted by the applicant to inform the opinion.

I should be grateful to receive any observations you may wish to make concerning the proposal so as to help inform the County Council's Scoping Opinion.

The County Planning Authority has a statutory duty to provide scoping opinions within 5 weeks of their receipt, and in order to do this it is essential that I receive prompt replies to this consultation. If you wish to comment will you therefore please do so **by 19 May 2016.** Please contact me if you require additional time to respond.

Please note that this communication is being issued via email only.

Should you have any queries as regards any of the above then please do not hesitate to contact me.

Kind Regards

Mrs Rachel Brophy BA(Hons) MA MRTPI
Planning Officer
Development Control

Mrs R Brophy (Planning Officer)
Cumbria County Council
Development Control
County Offices
Busher Walk
Kendal
LA9 4RQ

Our ref: NO/2018/110747/01-L01
Your ref: Scoping2017

Date: 11 May 2018

Dear Rachel

CONSULTATION ON A REQUEST FOR A SCOPING OPINION - PROPOSED APPLICATION FOR THE DETERMINATION OF CONDITIONS UNDER THE ENVIRONMENT ACT 1995 TO WHICH THE DORMANT MINERALS PLANNING PERMISSION REFERENCE CA49 (GRANTED PERMISSION BY THE FORMER CUMBERLAND COUNTY COUNCIL ON THE 8TH DECEMBER 1954) IS TO BE SUBJECT. THE PROPOSAL WILL ALSO INCLUDE AN AREA FOR PLANT, STOCKPILING AND STORAGE WHICH ALL RELATE TO THE QUARRYING OF LIMESTONE. ALSO INCLUDING A PLANNING APPLICATION FOR AN IMPROVED SITE ACCESS AS THE FORMER ACCESS WAS NOT CONSIDERED SUITABLE BY THE HIGHWAY; HIGH CLOSE QUARRY, PLUMBLAND, ASPATRIA, CUMBRIA

I refer to our recent phone conversation regarding the above Scoping Opinion consultation which was originally forwarded to the Environment Agency for comment on 28 April 2017. Unfortunately we have no record of replying to this consultation request and I apologise for any inconvenience this may have caused. I have however consulted our technical specialists since receiving a copy of the Scoping Report on 27 April 2018 and their comments are provided below:

The hydrogeology of groundwater flow in limestone geology is complex and variable often dominated by fissure flow solution features. The report states a geological & hydrogeological appraisal was completed in late 2016, early 2017 outlining angle of dip being 6-10 degree West or North west along the bedding plane based on borehole logs drilled to 40-60m. We cannot comment on the findings of this because it was not submitted with the application. This appraisal recognises the need for further hydrogeological assessment, however, we cannot comment on the extent of proposals for further work until the Geological & Hydrogeological Appraisal has been submitted.

We accept the proposal requires an Environmental Impact Assessment and this should review the impact of blasting on fractures/fissures in the geological beds and the impact (if any) on nature and dimension of groundwater flow. Any changes on the impact of direction, orientation and volume of flow could have a direct and derogatory effect on the quality of groundwater associated with leachate from the landfill. The further hydrogeological work recognised in paragraph 18.5 of the report needs to include risk assessment to this effect and the proposal for a 15m buffer from the landfill needs adequate justification.

Paragraph 8.3 of the report infers there is no groundwater pollution, as it has not been detected over the years. This is a nonsense because the resolution for the landfill written by Cumbria County Council did not require groundwater monitoring in its conditions for operation. The site was closed before the formation of the Environment Agency, therefore, there has been no statutory provision to monitor because no current permit exists.

Paragraph 18.2; Cumbria County Council has forwarded some surface water monitoring results, but their meaning in terms of their representation has never been clarified. Surface water run-off post restoration at this site should be relatively uncontaminated, if it represents field drainage over the landfill cap. Further information regarding landfill drainage and samples is required. Information regarding leachate monitoring and control should be included with the application.

Since the landfill site has no permit and is essentially brownfield with the potential for status as contaminated land under EPA 1990 Part 2A, the planning detail should effectively investigate the site as it would under the auspice of inspection for Part 2A. This essentially requires, site investigation and risk assessment, some of which may have been completed. Defra guidance can be found on the Defra website and in particular guidance note CLR11.

The boreholes drilled to establish potential for quarrying should be used to obtain groundwater samples (if possible) to help with the hydrogeological risk assessment. The proposed quarry may encourage migration of polluting leachate. It could act as a sink for collection of polluted groundwater and therefore a contingency plan for management of leachate both in the quarry and landfill should be integrated into operational conditions. This will depend on the findings of the ground investigation and risk assessment.

It should be noted that whilst the landfill condition on the Resolution required lining of the quarry prior to landfill. There is evidence to prove some of this work was not undertaken.

The EIA will need to be supported by a Hydrogeological Impact Assessment (HIA) which will need to include:

- A water features survey.
- The existing topography and drainage network of the site.
- The highest natural variation in the water table across the area of the proposed development. At least 2 years of monitoring from boreholes that enclose the site. The logs and installation details of each monitoring point will be required.
- Include sufficient geological plans and cross sections to adequately and clearly show the three dimensional relationship between the aquifers and the highest natural water levels therein within the existing topography, the proposed lowest excavation surface and the proposed final restoration surface.
- All levels on the logs, plans and water levels will need to be related to Ordnance Datum.
- A water management plan which will need to include potential mitigation measures to manage the potential inflow of contaminated water/leachate from the adjacent landfill.

Cont/d..

Please contact me on the details below should you have any queries or require further clarification.

Yours sincerely

Jeremy Pickup
Planning Advisor - Sustainable Places

[redacted]

End

Mr A Perry - Senior Planner
Stephenson Halliday Ltd
32 Lowther Street
Kendal
Cumbria
LA9 4DH

Our ref: NO/2018/110747/02-L01
Your ref: Scoping2017

Date: 03 August 2018

Dear Mr Perry

SCOPING OPINION - ENQUIRY RECEIVED 17 MAY 2018; HIGH CLOSE QUARRY, PLUMBLAND, ASPATRIA, CUMBRIA

I refer to your email to Rachel Brophy dated 17 May 2018 and write to provide the following comments which have been provided by our contaminated land specialist. Please note we are unable to provide comments from our groundwater specialist due to dry weather incident duties taking priority.

The latest correspondence assures the Planning Authority that the EIA will include reports on the monitoring, hydrogeological assessment and geotechnical assessment and that it will also address the information requirements outlined in the Environment Agency's letter of 11 May 2018. Since these reports will be reviewed accordingly when the EIA is submitted, the detail, understanding and agreement of environmental aspects need to provide sufficient evidence to demonstrate the development will not cause an unacceptable risk of pollution . This information will be key to acceptance of the proposal.

The responsibility for landfill risk assessment under Part 2A should quite rightly be "appropriate persons" i.e. polluters, landowners or occupiers of land and therefore the onus for investigations should be a matter for Cumbria County Council providing there is no overlap of the area defined by the landfill resolution and the 15m buffer exists between the waste and the quarry proposal. In the absence of confirmed landfill survey plans, the proposed buffer should be defined from the perimeter of the landfill resolution plan.

Likewise the proposed base of quarrying is planned to be above the water table to avoid potential inflow of groundwater and/or leachate contaminated groundwater from entering the quarry void. If groundwater levels derived from boreholes outside the landfill are below the invert level of the base of the landfill, limitations on quarrying should be defined, as a precaution, from the landfill base level unless a contingency plan for possible collection and evacuation of contaminated groundwater from the landfill has been agreed. Although the landfill was planned to be semi-contained with a clay basal seal, the liner would not have :

1. sealed sidewalls and
2. been engineered to earthworks specification.

In addition, there is evidence that the clay was absent from the first layers of deposit in the quarry. Therefore the landfill should not be considered as having adequate hydraulic containment.

Yours sincerely

Jeremy Pickup
Planning Advisor - Sustainable Places

[redacted]

cc R Brophy, Cumbria County Council

End

Northern Gas Networks
1st Floor
1 Emperor Way
Doxford International Business Park
Sunderland
SR3 3XR

Telephone No: 0800 040 7766
www.northerngasnetworks.co.uk

24 hour gas escape
number 0800 111 999

*calls will be recorded and may be monitored

Our Ref: 301624211
Your Ref: EMAIL ENQUIRY
Date: 12.06.2017

Rachel Brophy
Cumbria County Council
Development Control Team
Busher Walk
Kendal LA9 4RQ

Dear Sir / Madam,

Re: PROPOSED WORKS, High Close Quarry, Plumbland, Aspatria, Cumbria.

Northern Gas Networks acknowledges receipt of your notice of your intention to carry out work at the above location.

We enclose an extract from our mains records in the location of the area covered by your proposals together with a comprehensive list of precautions for your guidance. This plan shows only those pipes owned by Northern Gas Networks in its role as a Licensed Gas Transporter (GT). Gas pipes owned by other GT's and also privately owned may be present in this area. Information with regard to such pipes should be obtained from the owners. The information shown on this plan is given without obligation, or warranty, the accuracy thereof cannot be guaranteed. Service pipes, valves, siphons, stub connections, etc., are not shown but their presence should be anticipated. Your attention is drawn to the information and disclaimer on these plans. The information included on the enclosed plan should not be referred to beyond a period of 28 days from the date of issue.

There is High Pressure apparatus in the vicinity. It essential that no works or crossings of this high pressure pipeline are carried out until detailed consultation has taken place.

Safe digging practices, in accordance with HSE publication HSG47 "Avoiding Danger from Underground Services", must be used to verify and establish the actual position of mains, pipes, services and other apparatus on site before any mechanical plant is used. It is your responsibility to ensure that this information is provided to all persons (either direct labour or contractors) working for you on or near gas apparatus. In addition please follow the advice given on the gas safety card.

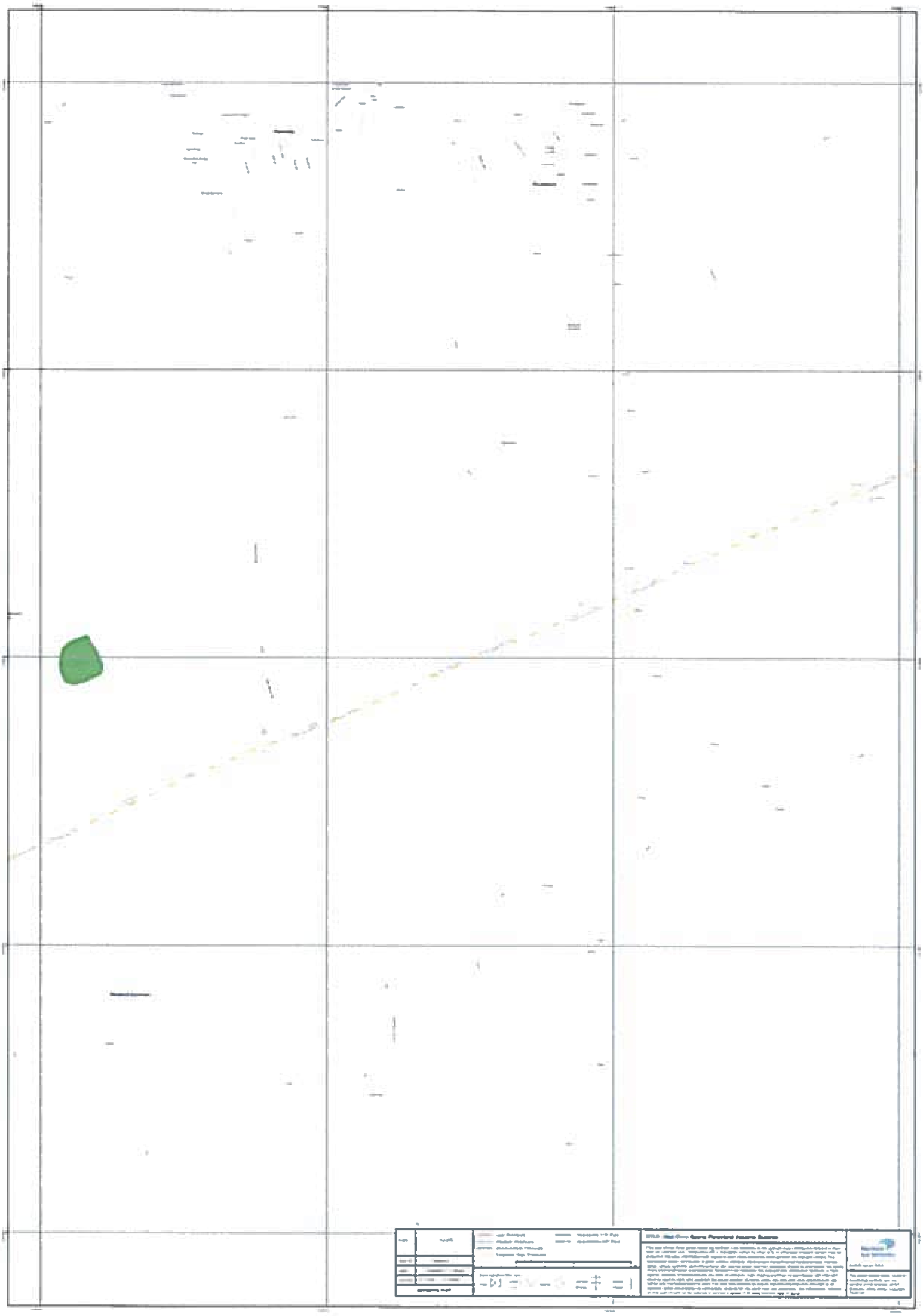
It must be stressed that both direct and consequential damage to gas plant can be dangerous both for your employees and the general public, repairs to any such damage will incur a charge. Your works should be carried out in such a manner that we are able to gain access to our apparatus throughout the duration of your operations.

You must contact Neil Hampshire, Network Support Officer on Telephone No. [redacted] before starting work.

Should you require any further assistance before starting any works please contact the telephone number below.

Yours faithfully,

JENNIE ADAMS
Network Records Assistant
[redacted]



Northern Gas Networks

Important Safety Guidance

Northern Gas Networks is the gas distribution company for the North East of England, Yorkshire and Northern Cumbria. We own about 37,000km of gas mains, and other vital equipment, which supply gas to some 2.7 million homes and businesses.

If you or one of your contractors plan to work near gas pipes or other Northern Gas Networks's equipment, you must let us know.

Damaging gas pipes is danagerous and potentially expensive. Not only could it lead to a fire or explosion, it could result in the loss of the gas supply to local communities.

Safety is therefore Northern Gas Networks's top priority. We need to ensure no-one damges our equpment and puts either themselves or membes of the public at risk. Our work in this area is encapsulated in the Pipeline Safety Regulations, and by the Northern Gas Networks's safety case, which is approved by the Health and Safety Executive (HSE).

Our website, www.northerngasnetworks.co.uk has safety guidance booklets that can be downloaded to assist you when carrying out any works. Please use these as reference gides prior to commencing works. Should you have any difficulty in downloading these documents, please either call 0800 040 7766, option 5, or via email: beforeyoudig@northerngas.co.uk

The guidance documents include this one and the following:

1. Safe working in the vicinity of high pressure gas pipelines and associated installations
2. Avoiding injury when working near gas pipes up to 7 bar
3. Avoiding injury when working near gas pipes

If at any point during your works, you smell gas, call the National Gas Emergency Service immediately on the Freephone 0800 111 999.

Examples of higher risk works are, but not limited to, the following:

- Any excavation works within 0.5m of low/medium pressure mains and 3m of intermediate and high pressure mains (the distance is measured from the proven position of the gas main).
- Demolition works within 15m of low/medium pressure mains and 150m of intermediate and high pressure mains.
- The use of explosives within 30m of low/medium pressure mains and 250m of intermediate and high pressure mains.
- Excavations within 10m of a pressure reduction unit.
- Excavations deeper than 1.5m.
- Heavy loading eg cranes, spoil deposits and heavy construction traffic.

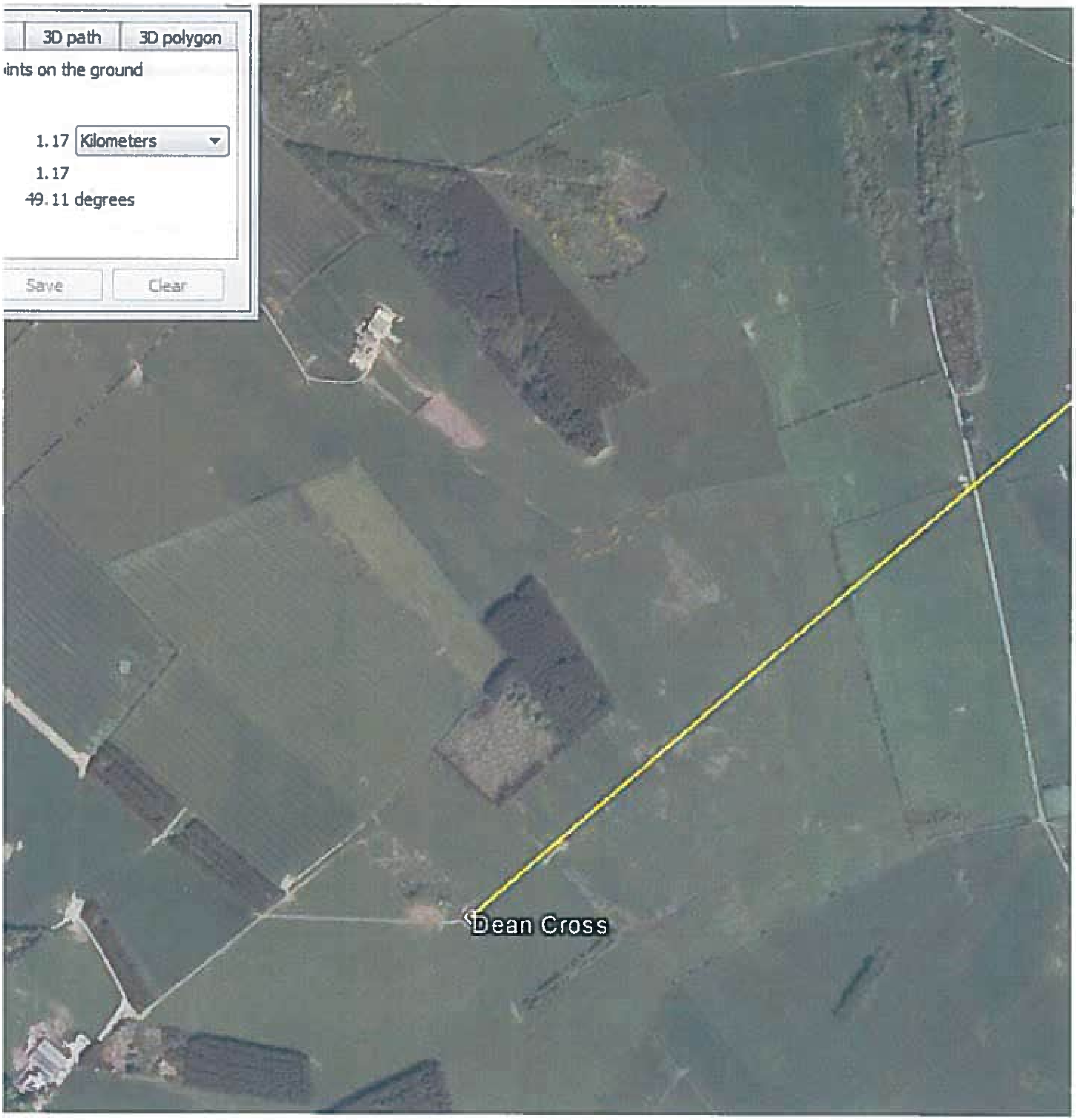
Development Control - Planning Dept address

From:	ROSSI, Sacha [redacted]
Sent:	28 April 2017 16:39
To:	Development Control - Planning Dept address
Cc:	NATS Safeguarding
Subject:	RE: Consultation on a Request for a Scoping Opinion - High Close Quarry, Plumbland, Aspatria, Cumbria
Attachments:	2017-04-05 High Close Quarry Scoping Report Low Res.pdf

Dear Sir/Madam,

NATS has an aeronautical radio beacon, known as a DME at a site 1km away from the proposal. While it is considered unlikely for the proposal to affect its operation, it should be noted that tall structures can obstruct the beacon's signal and cause degradation. Having assessed the application we don't consider any structure below 50m AGL to be of significance; should there be any plant rising above this height, NATS would expect the applicant to engage with it in order to ensure the safety of its operations are not compromised.

Regards
S. Rossi
NATS Safeguarding Office



NATS

Sacha Rossi
ATC Systems Safeguarding Engineer

[redacted]

4000 Parkway, Whiteley,
Fareham, Hants PO15 7FL
www.nats.co.uk/windfarms

From: Development Control - Planning Dept address [mailto:developmentcontrol@cumbria.gov.uk]
Sent: 28 April 2017 15:29
Cc: Development Control - Planning Dept address
Subject: Consultation on a Request for a Scoping Opinion - High Close Quarry, Plumbland, Aspatria, Cumbria

Dear Sir/Madam,

Town & Country Planning (Environmental Impact Assessment) Regulations 2011

Location: **High Close Quarry, Plumbland, Aspatria, Cumbria**
Proposal: **Proposed application for the determination of conditions under the Environment Act 1995 to which the dormant minerals planning permission reference CA49 (granted permission by the former Cumberland County Council on the 8th December 1954) is to be subject. The proposal will also include an area for plant, stockpiling and storage which all relate to the quarrying of limestone. Also including a planning application for an improved site access as the former access was not considered suitable by the Highway**
Ref No: **Scoping2017**

Cumbria County Council have received a request to provide a scoping opinion in relation to the above project in accordance with the above regulations.

Please find attached a copy of the information submitted by the applicant to inform the opinion.

I should be grateful to receive any observations you may wish to make concerning the proposal so as to help inform the County Council's Scoping Opinion.

The County Planning Authority has a statutory duty to provide scoping opinions within 5 weeks of their receipt, and in order to do this it is essential that I receive prompt replies to this consultation. If you wish to comment will you therefore please do so **by 19 May 2016.** Please contact me if you require additional time to respond.

Please note that this communication is being issued via email only.

Should you have any queries as regards any of the above then please do not hesitate to contact me.

Kind Regards

Mrs Rachel Brophy BA(Hons) MA MRTPI
Planning Officer
Development Control

Reg 22 Schedule

High Close Quarry - Schedule of Further Information Requirements (June 2020)	
Topic Area	**Information Required**
Traffic and Highways	
Transport Assessment - Traffic generation, traffic direction, traffic flow, accident data and junction capacity assessment	Transport Statement to be replaced by a Transport Assessment (TA) and reviewed/updated. The TA must include: consideration/proposal/assessment of alternative vehicle routing options (to avoid HGV traffic on the northbound section of the B5301), with a focus on the southern stretch of the B5301 and its junction with the A595; review of the width of the B5301; further junction capacity assessments; updated traffic flow surveys; review of accident data; and review of reserves, rate of extraction and proposed closure date, and anticipated tonnages/HGV movements to address inconsistencies in the Environmental Statement (ES).
Transport Assessment - Site Access - visibility splays and speed survey data (also relates to planning application 2/19/9011 Proposed Site Access)	Reconsideration of design of proposed site access required (ref. Planning application 2/19/9011). This must include a review of/revision to the visbility splays to the north and south (including review of width of the highway at the site access and review of extent of the planning application red line boundary); topographical survey and further speed surveys to be undertaken to inform the review, and the survey data presented and assessed in the revised Transport Assessment.
Transport Assessment - Cumulative transport impacts	Further information is required to assess the cumulative/in-combination impacts/effects arising from existing developments/activities and other development (consented or allocated) which has the potential to impact upon the same sections of the transport network. This must include other quarries in the vicinity, such as Moota Quarry, and Clints Quarry, and any other development which is existing, consented or allocated, within the vicinity of the site.
Transport Assessment - Sustainable Transport impacts	The Transport Assessment must include assessment of potential impacts of HGV traffic upon bus services and routes in the vicinity of the site, and cyclists and pedestrians, and any mitigations measures.
Transport Assessment - Travel Plan	Absence of Travel Plan. A Travel Plan should be provided.

Topic Area	Information Required
Public Rights of Way	
PROW	Clarification required on the impact of the proposals upon the public right of way, with specific reference being made to this in the proposal. Would the proposals physically affect any public rights of way (eg. would any be temporarily or permanently obstructed or closed)? Review of the impacts of the proposals on the amenity/users of public rights of way.
Hydrology, Hydrogeology and Drainage	
Hydrology, Hydrogeology - Landfill site	Further information required to address the comments raised by the Environment Agency and others. The proposal site includes a former domestic landfill known to be leaching contaminants into groundwater and there is insufficient information to demonstrate risk of pollution to controlled waters from quarrying activities is acceptable. Further information and assessment required to demonstrate that risk to controlled waters has been fully understood and can be adquately addressed/mitigated. An hydrogeological and geotechnical review of data and assessments and further detailed monitoring and assessment of hydrological impacts of quarrying adjacent to the landfill is required, to include: further groundwater sampling and groundwater analysis (including seasonal variations and more than general groundwater chemistry); further detailed analysis of chemical content of leachate and groundwater, to include metals and organic/inorganic contaminants (and the presence/absence of Hazardous/Listed Substances); review/analysis of effects of blasting/quarrying on fractures/fissures, transmission and quality of leachate migrating from landfill mass; detailed contingency plan for management, interception and treatment of contaminated groundwater; and risk assessment (see below - Environmental Impacts: Contaminated Land).
Landfill Site	Further information required to address landfill related issues, including establishing the baseline position, the state of the landfill (capped/lined or otherwise) and implications for quarry development; the presence/otherwise of leachate off-site/in adjacent watercourses; the adequacy of proposed buffer between the proposed quarry and the landfill site (review required); proposals/ responsibilities for ongoing and future monitoring (including detecting/ remediating any pollution events), during working and post closure of quarry, and implications for site restoration/aftercare; review of development proposals (including internal haul/access roads, conveyor, planting, bunding) on/in the vicinity of the landfill site to minimise/remove potential for impacts, provision of detailed/revised proposals and assessment of impacts.
Drainage	Detailed drainage scheme/design (to cover surface water and ground water management), is required to be submitted prior to determination of this application. A United Utilities (UU) water asset runs down the eastern boundary on the site. There is also a Service Reservoir in the vicinity of the site. Further information is required to demonstrate that such infrastructure/ assets would not be adversely affected by the proposals, including from blast vibration.

Topic Area	Information Required
Hazards	
Gas Pipeline	Further information required to address the comments raised by Northern Gas Networks (NGN), with reference to the gas pipeline crossing the site (Bothel to Derwent Park 350mm dia, 19 bar max pressure - registered as Major Accident Hazard Pipeline). Issues to address include: diversion of the pipeline or otherwise and review/assessment of potential impacts of either scenario; compliance with required stand-off distances [relating to the proposed features of the development (eg. location of built structures, haul route, tree planting etc.) and method of working (incuding blasting operations)] with respect to safety (and legal) matters; requirements in terms of any change to ground levels and location of drainage ponds/lagoons over/in the vicinity of the existing pipeline; protection requirements as regards any access points (temporary or permanent - to include the location of the quarry access road) over/relative to the pipeline; safety precautions to be adhered to by any third parties carrying out ground works. Any changes to the proposals will require further review/assessment of all potential impacts.
Environmental Impacts	
Environmental Impacts: Noise	Further information and review of noise assessments required to address the technical matters relating to noise assessment methodology raised by Allerdale Borough Council (Environmental Health), and all requirements as set out in the Scoping Opinion (June 2019 - Noise and Health Sections). Further assessment/review required of the potential impacts of noise in the Plumbland area/locality, to include High Close Farm, and additional assessment required to assess impacts of noise on Plumbland School.
Environmental Impacts: Dust and Air Quality	Further information and review required of air quality/dust assessments, including from the impacts of HGVs, to include a review of baseline assessment to take account of seasonal variations and prevailing weather conditions; the number, nature and proximity of local receptors (to include Plumbland School and High Close Farm); consideration of cumulative effects from quarries (includng Moota Quarry and Clints Quarry) and other developments, and levels of suspended particulate matter (including PM10, PM2.5, SO2, NO2 levels and any SiO2 levels). The further information submitted must address all requirements as set out in the Scoping Opinion (June 2019 - Air Quality and Health sections).
Environmental Impacts: Blasting	Further information/clarification required, to include identification of frequency of blasting; further assessment of nuisance/amenity impacts on residents/local receptors (to include those at the identified receptor points and High Close Farm); proposed blasting levels, potential impacts and associated perceptions. The further information submitted must address requirements specified in Scoping Opinion (June 2019 - Blasting and Ground Vibration and Health sections).

Topic Area	Information Required
Environmental Impacts: Blasting	Further information required to assess the potential impacts of blasting upon the public highway (B5301) and users of the highway (also any associated traffic impacts - to be included in updated Transport Assessment - see above); and to assess the potential impacts of blasting upon the existing landfill site, the gas pipeline crossing the site, and utilities infrastructure (see above - Landfill Site; Hazards: Gas Pipeline; Drainage).
Environmental Impacts: Contaminated Land	Provision of a contamination risk assessment, prior to determination of the application, due to the former use of the site for landfill, and the potential for contaminated land, soils, waters and gas (including potential for production/migration of landfill gas to affect structures on or in proximity to the landfill site). This should commence with a desk top study/site walkover, and be in accordance with the Planning Practice Guidance (PPG) (Land affected by contamination; Paragraph: 007).
Archaeology/Cultural Heritage	
Archaeology/Cultural Heritage	Provision of a geophysical survey and assessment prior to determination of the application to provide information on the presence/absence and significance of any archaeological assets surviving below ground and how their significance would be impacted by the proposed development. The survey must also include those areas of the site which have not been subject to previous extraction.
Archaeology/Cultural Heritage - LDNP	Update the Cultural Heritage Chapter of the ES to make reference to the Lake District National Park (LDNP) as a World Heritage Site and assess the impacts upon this designation. As a minimum, the extent to which the Attributes of Outstanding Universal Value of the Word Heritage Site could be impacted upon along with their setting, should be identified and considered as part of any assessment.
Archaeology/Cultural Heritage - other Heritage Assets	Update the Cultural Heritage Chapter of the ES to assess the impacts of the proposals upon all other heritage assets in the vicinity of the site. This must include assessing the impacts on the significance of designated heritage assets, such as listed buildings, and non-designated heritage assets, and their respective settings, in accordance with the NPPF (Section 16) and PPG (Decision-making: historic environment). Cumulative impacts should also be considered.

Topic Area	Information Required
Landscape/Visual Impacts	
LVIA	The Landscape and Visual Impact Assessment (LVIA) must be reviewed and updated to include review of assessment of impacts on local receptors; reference to the Lake District Landscape Character Assessment SPD and the attributes and sensitivities of the landscape it identifies; assessment from higher elevation receptors within the LDNP; review/update of cumulative impact assessment, to include other quarries, and other developments, and as a minimum reference to Moota Quarry and Clints Quarry; assessment of potential impacts of lighting upon the landscape and visual amenity/receptors (including during dawn, dusk and night time) and identification of mitigation measures.
Ecology	
Ecology	Ecology Chapter of the ES to be reviewed and updated to include proposals to reduce impacts upon Priority Habitats within the site (Woodland and Hedgerow), acknowledgement of their Priority status, further assessment of impacts and consideration of mitigation/compensation proposals, and enhancements of remaining woodland; further consideration of restoration/aftercare proposals, including an extended period for calcareaous grassland creation; update of biodiversity net losses/gains assessment with reference to toolkit/matrix as appropriate submission of draft Landscape and Ecological Management Plan (LEMP)
Ecology - Protected Species	Further Protected Species surveys are required prior to determination - relating to Bats and Red Squirrels - impacts assessed and mitigation measures proposed.
Ecology - Lighting	Impact of lighting upon ecological receptors and bats in particular must be assessed and mitigation measures proposed.
Ecology - Hydrological issues	The Hydrological assessment to be reviewed and updated to provide further clarification/information in relation to the Zone of Influence of the site and potential likely effects upon nearby surface water and springs. (See also Hydrology, Hydrogeology and Drainage - Landfill Site above).
Climate Change	
	Review and update of Climate Change elements of the ES in the light of changes to proposals and existing and latest local and national policies/guidance. Incorporation of a stand alone chapter into the revised ES.
Cumulative and in-combination effects	
	Review and update for all aspects of the ES, to include assessment of the cumulative/in-combination impacts/effects arising from any other development which is existing, consented or allocated within the vicinity of the site, and to include reference to Clints Quarry. (See Scoping Opinion June 2019 - Cumulative and in-combination effects).

Topic Area	Information Required
Working Hours	
	There must be clarity/consistency presented within the proposal/assessments and proposed conditions as regards hours of operation. Any changes may require reassessment of impacts (eg. traffic, noise, dust, blasting etc.)
Reserves, Rate of Extraction, HGV Movements	
	Review of reserves, rate of extraction and proposed closure date, and anticipated tonnages/HGV movements required to address inconsistencies presented in ES. Any changes may require reassessment of impacts.
Drawings	
	Revised and updated drawings required to be submitted, to address changes/amendments to the proposals.
Reference Lists	
	The reference lists detailing the sources used for the descriptions and assessments included in the ES to be reviewed and updated.
Public Engagement	
	Updated report on public/community engagement to be included in the revised ES, to include reference to the public meeting held on 19 October 2019 (and all subsequent engagement). This should include list of issues raised and how these matters have been addressed in the revised submissions.
Non- Technical Summary of Further Information	
	The Non-Technical Summary submitted with the ES to be reviewed and updated as required by the EIA Regulations.
Other Information Requirements:	
Proposed Planning Conditions	Proposed Planning Conditions to be reviewed and updated.
Planning Statement	Planning Statement to be reviewed and updated.

APPENDIX 2:
LANDSCAPE AND VISUAL IMPACT ASSESSMENT (LVIA)

STEPHENSON HALLIDAY

Planning, Landscape & Environment

HIGH CLOSE QUARRY, NEAR ASPATRIA, CUMBRIA

LANDSCAPE AND VISUAL IMPACT ASSESSMENT

Prepared for:

Thomas Armstrong (Aggregates) Ltd
Workington Road
Flimby
Maryport
Wigton
CA7 4NS

Prepared by:

Stephenson Halliday LTD
30 – 32 Lowther Street
Kendal
Cumbria
LA9 4DH

FEBRUARY 2023

CONTENTS

APPENDICES

FIGURES

LANDSCAPE AND VISUAL IMPACT ASSESSMENT

1 INTRODUCTION

LVIA Update Context

1.1 This Landscape and Visual Impact Assessment has been reviewed following the submission the Environmental Statement in August 2019, and a significant period of consultation and consideration of all responses, The LVIA has been revised accordingly in line with the Regulation 22 Schedule (Reg 22) of Further Information Required, request from Cumbria County Council in respect of the landscape and visual impacts as set out below.

"The Landscape and Visual Impact Assessment (LVIA) must be reviewed and updated to include review of assessment of impacts on local receptors; reference to the Lake District Landscape Character Assessment SPD and the attributes and sensitivities of the landscape it identifies; assessment from higher elevation receptors within the LDNP; review/update of cumulative impact assessment, to include other quarries, and other developments, and as a minimum reference to Moota Quarry and Clints Quarry; assessment of potential impacts of lighting upon the landscape and visual amenity/receptors (including during dawn, dusk and night time) and identification of mitigation measures."

1.2 The LVIA also takes account of the proposed working scheme amendments (See ES Chapter 2: Description of Proposals) and the late 2019 - 2020 consultation responses from Allerdale Borough Council, Lake District National Park Authority (LDNPA), Plumbland Parish Council and residents. The responses referred to the following:

- Include former Clints Quarry in the cumulative effects section (Moota Quarry already included);
- Reference to LDNPA as World Heritage Site (WHS) and Lake District Landscape Character Assessment SPD, and explanation/justification of study area; and
- Include impacts of lighting within the assessment.

1.3 To address the Regulation 22 Further Information requirements and other responses the revised LVIA provides the required information at the following paragraphs / sections:

- Former Clints Quarry cumulative effects paragraphs 2.9-2.10, 11.19 and Section 9 Cumulative Effects
- Supplementary Planning Document (SPD) references on paragraph 5.4, 7.35, 11.8
- Impact of lighting effects paragraphs 2.11, 11.20 and Section 10 Lighting

1.4 On the 8th – 9th January 2020 contact with LDNPA Area Planner who prepared the consultation response was undertaken. Agreement was obtained on how the original LVIA had been undertaken and the study area. Also regarding the WHS the agreed strategy was it would be included in the Archaeological / Cultural Heritage Assessment.

1.5 The Landscape and Visual Impact Assessment (LVIA) of the High Close Quarry proposed minerals development has been prepared by Stephenson Halliday Ltd, a firm of independent Environmental Consultants and Landscape Architects. The assessment has been prepared with the aim of identifying the predicted landscape and visual effects, which would result from the proposed minerals development (Proposal).

1.6 Stephenson Halliday Ltd is a competent expert in LVIA. Stephenson Halliday has been involved in LVIA for Environmental Impact Assessment (EIA) since its creation in 2001. Since that time the company has undertaken LVIA in connection with the Environmental Statements produced for over 50 mineral and quarry developments. All qualified landscape architects at Stephenson Halliday are members of the Landscape Institute. Stephenson Halliday's high level of experience and expertise in EIA has been recognised by the Institute of Environmental Management and Assessment (IEMA) in awarding the company its quality mark.

Consultation

1.7 A Scoping Report was submitted to Cumbria County Council in April 2017 with regards to commencement of the previously permitted minerals development, currently a dormant planning permission. The Scoping Opinion was received from Cumbria County Council on the 6th June 2019.

1.8 The initial LVIA was undertaken in response to consultation and the Scoping Opinion received from Cumbria County Council regarding the scope, assessment baseline, the assessment study area and the LVIA site photography locations. As stated in paragraphs 1.1 to 1.4, the LVIA has been revised to take full account of the Regulation 22 Schedule of Further Information Required

High Close Farm

1.9 An LVIA assessment was completed for the Proposal at High Close in December 2017. For commercial reasons, Thomas Armstrong Ltd delayed the submission of the application and the Environmental Statement. At the time the assessment was completed, Thomas Armstrong Ltd owned High Close Farm and it was included in the assessment. Since then, the Company has sold High Close Farm, together with some land to the north of the proposed development to a local person.

1.10 The new owner was fully aware of the proposal to quarry and implement the dormant planning permission, but was keen to buy the property. The proposal has been in the public arena following the formal request to Cumbria County Council for a Scoping Opinion in April 2017.

1.11 As part of the sale and purchase agreement the new owner, being completely aware of the proposal, has formally and legally agreed that he will not object to the proposed application or to the ongoing operations. Also, this covenant will apply to future owners.

1.12 The revised 2019 LVIA assessment took into account that High Close Farm is now not in the ownership of the applicant.

Assessment Format

1.13 The LVIA is organised in the following sections:

- Scope of the Landscape and Visual Impact Assessment;

- Assessment Methodology and Significance Criteria - an outline of the general methodology employed in the LVIA, and assessment of the significance of effects;
- Policy - an outline of the local planning policies which are relevant to the LVIA;
- Baseline description - to identify, confirm and evaluate the key landscape elements/features/characteristics of the landscape surroundings the Proposal, including a review of the extent, purposes and special characteristics of landscape planning designations within the study area for the LVIA;
- The Proposal and mitigation - describes the aspects of the proposed quarry development which have the potential to cause a landscape and/or visual effect, and the measures which will be incorporated into the project design to mitigate these potential effects;
- Landscape effects of the Proposals - assesses the significance of effects arising from the proposed mineral operations on the landscape fabric, landscape character and quality of the landscape types and designated areas within the study area;
- Visual effects of the Proposals - assesses the significance of effects arising from the Proposals on the visual amenity of the receptors within the study area;
- Cumulative Assessment – assesses the significance of sequential and intervisibility cumulative effects arising from the Proposals on the landscape and visual receptors;
- Summary of operational and residual effects and conclusions - a summary of the assessment results and conclusions regarding the likely significant landscape and visual effects of the Proposal.

1.14 This report should be read in conjunction with the following figures:

- Landscape and Visual Impact Assessment LVIA Figures 1 to 9;
- Landscape and Visual Impact Assessment Photographs 1- 16.

1.15 The following supporting information is contained within the LVIA Appendices:

- LVIA Appendix 1: LVIA Methodology;
- LVIA Appendix 2: Photograph Locations;
- LVIA Appendix 3: Landscape Sensitivity Assessment.

2 SCOPE OF THE ASSESSMENT

2.1 Although linked, landscape and visual effects are identified and considered separately. Landscape effects derive from changes in the landscape fabric, which may result in changes to character, whereas visual effects are the effect of these changes as experienced by people (visual receptors).

Study Area

2.2 Best practice guidance 'Guidelines for Landscape and Visual Impact Assessment Third Edition' (2013) ("GLVIA 3") states:

'Scoping should identify the area that needs to be covered in assessing visual effect, the range of people who may be affected by these effects and the related viewpoints in the study area that will need to be examined. The study area should be agreed with the competent authority at the outset and should consider the area from which the proposed development will potentially be visible. The emphasis must be on a reasonable approach which is proportional to the scale and nature of the proposed development.'

2.3 The best practice guidance also states:

'Scoping should also identify the area of landscape that needs to be covered in assessing landscape effects. This should be agreed with the competent authority, but it should also be recognised that it may change as the work progresses, for example as a result of fieldwork, or changes to the Proposal. The study area should include the site itself and the full extent of the wider landscape around it which the proposed development may influence in a significant manner. This will usually be based on the extent of Landscape Character Areas likely to be significantly affected either directly or indirectly.'

2.4 Given the scale and location of the proposed High Close Quarry, the landscape and visual impact assessment is proportionate to the complexity of the Proposal and sensitivity of the landscape. The baseline review of potential receptors will consider and map those within 3km of the dormant permission boundary Ref: CA49 and also consider potential for more distant receptors, if necessary.

2.5 The assessment considers the potential effects upon:

- Landscape fabric and landscape character;
- Effect on landscape designations;
- Visual receptors including residential, transport and recreational receptors.

2.6 Effects on any Conservation Areas and other heritage assets will be dealt with as part of a separate cultural heritage assessment.

Assessment Scenario

2.7 The assessment considers the landscape and visual effects which might arise as a result of the Proposal, which consists of two components; the operational Phase and the final restoration.

- Operational effects: A comparison between the existing site, comprising primarily agricultural grassland, a former quarry which has been landfilled and returned to agricultural grassland and the Proposal;
- Residual effects (post-restoration): A comparison between the existing site and the proposed final restoration (See Indicative Quarry Development Plan: Final Restoration, Figure 14).

Future Baseline

2.8 We are not aware of any future baseline that would need to be considered as part of the assessment other than the cumulative assessment below. Cumbria County Council has not provided any information regarding other consented Proposals which should be considered.

Cumulative Assessment

2.9 It is considered that the most likely potential for significant cumulative effects may arise as a result of the incremental change of separate quarry developments within the study area and the effect of these projects over time on the communities and landscapes.

2.10 This includes consideration of the existing operational Moota Quarry site within the study area approximately 1km to the southwest of the proposed High Close Quarry and the former Clints Quarry, a potential future development approximately 1.2 km to the southeast. A Scoping Opinion has been issued by the Lake District National Park Authority.

Lighting

2.11 The potential impact of lighting effects has been considered in principle and included in the LVIA assessment.

3 ASSESSMENT METHODOLOGY AND SIGNIFICANCE CRITERIA

Methodology

3.1 Landscape effects derive from changes in the physical landscape elements which may give rise to changes in its distinctive character and how this is experienced, including consideration of aesthetic and perceptual aspects.

3.2 Visual effects relate to changes that arise in the composition of available views as a result of changes to the landscape, to people's responses to the changes and to the overall effects with respect to visual amenity.

3.3 The methodology forming the basis for this assessment is set out within LVIA Appendix 1 and summarised below. The criteria used for the assessment and definitions of the terms used form an essential part of this chapter.

3.4 The assessment of the landscape and visual effects has been carried out in accordance with the following best practice guidance:

- Guidelines for Landscape and Visual Impact Assessment, (Third Edition), published jointly by the Landscape Institute and the Institute of Environmental Assessment (2013).

- Annotated photosheets (LI Type 1) showing the existing views are presented for each viewpoint. The method of visualisation selected has been informed by Landscape Institute Technical Note 06/19 Visual Representation.

3.5 *"Landscape and Visual Impact Assessment is a tool used to identify and assess the significance of and the effects of change resulting from development on both the landscape as an environmental resource in its own right and people's views and visual amenity."* (GLVIA3, paragraph 1.1). Wherever possible, identified effects are quantified, but the nature of landscape and visual assessment requires interpretation by professional judgement. In order to provide a level of consistency to the assessment, the prediction of magnitude and assessment of significance of the residual landscape and visual effects have been based on pre-defined criteria.

3.6 The Guidelines for Landscape and Visual Assessment (Third Edition) (GLVIA3) states that *"professional judgement is a very important part of the LVIA"* (paragraph 2.23) and that *"in all cases there is a need for the judgements that are made to be reasonable and based on clear and transparent methods so that the reasoning applied at different stages can be traced and examined by others."* (Paragraph 2.24).

Significance Criteria

3.7 The following information sets out the correlation between magnitude and sensitivity to determine the significance of potential effects.

3.8 The significance of any identified landscape or visual effect has been assessed in terms of major, moderate, minor or negligible (refer to LVIA Appendix 1 and Table 1 below). Intermediate correlations are also possible and depend upon professional judgement, i.e. major/moderate.

Table 1: Significance of Predicted Effects

	Magnitude of Change				
		Substantial	Moderate	Slight	Negligible
Landscape / Visual Sensitivity	High	Major	Major/ Moderate	Moderate	Minor
	Medium	Major/ Moderate	Moderate	Moderate/ Minor	Minor/ Negligible
	Low	Moderate	Moderate/ Minor	Minor	Negligible

3.9 These categories are based on the juxtaposition of viewpoint or landscape sensitivity with the predicted magnitude of change. This juxtaposition is not used as a prescriptive tool, rather it allows for the exercise of professional judgement. Thus, in some instances a particular parameter may be considered as having a determining effect on the analysis. Where the landscape effect has been classified as major or major/moderate this is considered to be equivalent to likely significant effects referred to in The Town and Country Planning (Environmental Impact Assessment) Regulations 2017. Where moderate effects are predicted, professional judgement will be applied to ensure that the potential for significant effects arising has been thoroughly considered.

4 LANDSCAPE PLANNING POLICY

4.1 Regional and local landscape planning policy outlines the criteria and principles to which the Proposals will be assessed against, as part of the application process. 'Chapter 5 – Planning Policy Review' of the Environmental Statement provides details of the planning policy within Cumbria County Council's administrative area and the status of adopted and emerging policy documents.

4.2 The relevant planning policy documents relating to the Application Site are:

- Cumbria Minerals and Waste Local Plan 2015 – 2030, September 2017.

4.3 Development Control Policy DC6, Cumulative environmental impacts from the Cumbria Minerals and Waste Local Plan, September 2017 states that *'Cumulative impacts of minerals and waste development Proposals will be assessed in the light of other land-uses in the area. Where appropriate, considerations will include:*

a. all environmental aspects including habitats and species, visual impact, landscape character, cultural heritage, noise, air quality, ground and surface water resources and quality, agricultural resources and flood risk;

b. the impact of processing and other plant;

c. the type, size and numbers of vehicles generated, from site preparation to final restoration and their potential impacts on the transport network, safety and the environment;

d. impacts on the wider economy and regeneration;

e. impacts on local amenity, community health and areas for formal and informal recreation.'

4.4 Development Control Policy DC18 Landscape and Visual Impact from the Cumbria Minerals and Waste Local Plan, September 2017 states that *'Proposals for development should be compatible with the distinctive characteristics and features of Cumbria's landscapes and should:*

a. avoid significant adverse impacts on the natural and historic landscape;

b. use Landscape Character Assessment to assess the capacity of landscapes to accept development, to inform the appropriate scale and character of such development, and guide restoration where development is permitted;

c. in appropriate cases, use the Guidelines for Landscape and Visual Impact Assessment to assess and integrate these issues into the development process;

d. ensure that development Proposals avoid significant adverse visual impacts and consider the effects on: locally distinctive natural or built features; scale in relation to landscape features; public access and community value of the landscape; historic patterns and attributes; and openness and remoteness;

e. ensure high quality design of modern waste facilities to minimise their impact on the landscape, or views from sensitive areas, and to contribute to the built environment;

f. direct minerals and waste developments to less sensitive locations, wherever this is possible, and ensure that sensitive siting and high quality design prevent significant adverse impacts on the principal local characteristics of the landscape including views to or from, and the setting of, Areas of Outstanding Natural Beauty, the Heritage Coast, National Parks or World Heritage Sites.'

4.5 Development Control Policy DC 22 Restoration and Aftercare from the Cumbria Minerals and Waste Local Plan, September 2017 states that *'Proposals for minerals extraction, or for temporary waste facilities such as landfill, shall be accompanied by restoration and aftercare Proposals with sufficient detail to clearly demonstrate that the overall objectives of the scheme are practically achievable, including a vision for overall restoration of the site, and to include Proposals for appropriate afteruse and the means to achieve it. The level of detail required will depend on the circumstances of each specific site including the expected duration of operations on the site. In all cases, restoration schemes must demonstrate that the land is stable and that the risk of future collapse of any mine workings has been minimised.*

After-uses that enhance biodiversity, geodiversity and the environment, conserve soil resources, conserve and enhance the historic environment, increase public access, minimise the impacts of global warming and are appropriate for the landscape character of the area, will be encouraged. These could include: nature conservation, agriculture, leisure and recreation, green infrastructure and woodland.

Where sites accord with other policies in the Plan, an alternative or mixed afteruse that would support long term management, farm diversification, renewable energy schemes, tourism or employment land, may be acceptable.

All Proposals must demonstrate that:

a. for agricultural, forestry, nature conservation and amenity afteruses, there is an aftercare management programme of at least 5 years, but longer where required to ensure that the restoration scheme is established;

b. the restoration is appropriate for the landscape character and wildlife interest of the area, and measures to protect, restore and enhance biodiversity and geodiversity conservation features are practical, of a high quality appropriate to the area and secure their long-term safeguarding and maintenance;

c. the restoration scheme is compatible with neighbouring land uses;

d. restoration will be completed within a reasonable timescale and is progressive as far as practicable;

e. provision for the likely financial and material budgets for the agreed restoration, aftercare and afteruse will be made during the operational life of the site;

f. restoration and aftercare (or reclamation) will be undertaken using industry best practice.

Once peat workings have become non-operational, they should be restored to peat regeneration wherever feasible, using best practicable measures. Where such re-generation is not demonstrably feasible, the detailed restoration scheme should minimise carbon loss and maximise both habitat re-creation and carbon sequestration capacity across the site.'

5 BASELINE DESCRIPTION

5.1 With reference to LVIA Figures 1 - 8, this section describes baseline conditions in relation to existing landscape character, local landscape elements and features, landscape planning designations and visual receptors.

Landscape Context

5.2 The Site is located (See LVIA Figures 2 & 7) on the boundary of National Landscape Character Area 6 (NCA 6) and National Character Area 8 (NCA 8). NCA 6: Solway Basin is described as *'undulating low hills that grade into the coastal plain and estuarine landscape of the Solway Firth. To the east and south and across the lowlands of the Dumfries coast to the north, the lowland landscape is framed by the uplands of the Lake District, the North Pennines and southern Scotland.'*

5.3 NCA 8: Cumbria High Fells is described as a landscape which *'covers the north and central Lake District and is largely within the Lake District National Park. It is a dramatic upland landscape, carved by past glaciations, with rugged peaks, ridges and open fells, separated by U-shaped valleys with a radiating pattern of lakes and rivers.'*

Local Landscape Character

5.4 The character of the local landscape within and surrounding the Site has been assessed in:

- The Cumbria Landscape Character Guidance and Toolkit, March 2011; and
- The Lake District National Park Landscape Character Assessment and Guidelines Supplementary Planning Document (SPD), Revised April 2021.

5.5 The northern edge of the site is located within the landscape character type: 5 Lowland and more specifically the landscape character sub-type 5a: Ridge and Valley (See LVIA Figures 2 & 7). The key characteristics of this landscape character sub-type are:

- *'A series of ridges and valleys that rises gently toward the limestone fringes of the Lakeland Fells;*
- *Well managed regular shaped medium to large pasture fields;*
- *Hedge bound pasture fields dominate, interspersed with native woodland, tree clumps and plantations;*
- *Scattered farms and linear villages found along ridges;*
- *Large scale structures generally scarce.'*

5.6 Sensitive characteristics or features include *'The peaceful pastoral atmosphere away from busier parts is sensitive to large scale development'* and *'Open and uninterrupted views from ridge tops to the Solway Firth and Lakeland Fells are sensitive to large scale infrastructure development.'*

5.7 Guidelines for development encourage with regard to minerals development for the development of *'restoration schemes that reinforce the landscape features and provide ecological enhancement.'*

5.8 The remaining site extent is located within the landscape character sub-type; 12b Rolling Fringe, part of the landscape character type; 12 Higher Limestone (See LVIA Figures 2 & 7). The key characteristics of this landscape character sub-type are:

- *'Large-scale undulating topography;*
- *Large fields of improved pasture;*
- *Stone walls mainly in the east, occasional hedges and fence boundaries;*
- *Very sparse tree cover;*
- *Some large scale conifer plantations;*
- *Small streams and rivers cut through the rolling topography.'*

5.9 Sensitive characteristics or features include *'open, uninterrupted views across moorland to a backdrop of hills are sensitive to large prominent infrastructure or other development.'*

5.10 LVIA Figure 2 illustrates the remaining local landscape character types and sub-types within and beyond the 3km study area which comprise:

- Landscape character type H: Upland Valley, located to the south and southeast of the site predominantly beyond the 3km study area;
- Landscape character type I: Upland Limestone Farmland, which is located approximately 3.5km to the south of the Site;
- Landscape character type J: High Fell Fringe, comprises the southern parts of the study area south of the A595, within the Lake District National Park, 1.2km – 3.5km from the Site; and
- Landscape character sub-type: 5b Low Farmland (LCT 5 Lowland) is positioned approximately 5km to the north west of the site beyond the 3km study area.

Landscape Planning Designations

5.11 The Lake District National Park is located within the study area approximately 1.2km to the south and southeast of the Site beyond the A595.

5.12 There are no other statutory or non-statutory landscape planning designations located within the 3km study area (See LVIA Figures 1 & 6).

Visual Receptors

5.13 This section considers which receptors within the study area would have the potential for an effect on their visual amenity as a result of the Proposal and includes the following groups of receptors:

- Residents and workers - in towns, villages and isolated dwellings;
- Motorists and other road users on link roads, A class, B class and minor roads; and

- Recreational receptors including walkers, cyclists and horse riders on local public rights of way, tourists, users of outdoor recreational areas and open access land.

5.14 The Zone of Theoretical Visibility (ZTV) illustrated on LVIA Figure 5 provides a bare earth indication of the potential visibility of the Proposal and further indicates the potential horizontal extent of the view that could be occupied by High Close Quarry if seen to its maximum theoretical visibility (excluding the effects of screening by localised woodland).

5.15 The ZTV indicates that potential visibility of the Proposal would be primarily concentrated to the immediate vicinity of the site and intermittent primarily elevated areas to the east, north, south and southeast. There would be little or no views from the west and southwest (beyond 1km) due to the visually containing nature of the landform surrounding the site.

5.16 It is important to note that the ZTV does not show the screening effects from obstacles such a built form or woodland blocks across the landscape, which would reduce actual visibility even further than the predicted bare earth ZTV indicates. It does however provide an initial baseline for the areas which might be affected by the Proposal.

5.17 Field work has allowed the verification of the extent of the visibility to inform the assessment of the potential effects of the proposed operations and final restoration.

<u>Residents</u>

5.18 With reference to LVIA Figures 5 & 8, below is a list of the nearest residential receptors, where there is the greatest potential to experience visual effects as a result of the Proposal (distances referenced this assessment relate to distances to the proposed development as opposed the dormant permission boundary):

- High Close Farmhouse (with the site boundary owned by Thomas Armstrong Ltd until early – mid 2019).;
- Plumbland village c.500m to the northeast;
- Adams Ghyll c.480m to the northeast;
- Parsonby hamlet c.500m to the north;
- Arkleby village c.885m to the north;
- Threapland hamlet c.1,020m to the northeast;
- Threapland Lees Farmhouse c.1.26km to the east;
- Oughterside and Prospect villages c.3.2km – 3.6km to the north west;
- Aspatria town c.2.7km to the north;

5.19 Due to the screening effect of the localised landform and intervening mature woodland and tree vegetation there would be predominantly no views from the settlements of Gilcrux to the west, Blindcrake to the south and Bothel to the east.

Recreational Receptors

5.20 There would be no physical effect upon any Public Rights of Way. Recreational routes and destination within the study area from which the development may be visible include:

- Local Public Rights of Way (PRoW) to the immediate north of the Proposal in the vicinity of Plumbland, Parsonby and Arkleby;
- Local Public Rights of Way (PRoW) to the east of the Proposal west of Bothel
- Local Public Rights of Way (PRoW) to the immediate south of the Proposal west of the B5301; and
- Local Public Rights of Way (PRoW) in the vicinity of Aspatria, Oughterside and Harriston approximately 2.5km – beyond 3km from the Proposal.

5.21 National Cycle Route 10 and the remaining Local Public Rights of Way (PRoW) are located outside the zone of theoretical visibility (ZTV).

Motorists and Other Road users

5.22 In terms of rail users and road users, visibility towards the Application Site would potentially be experienced from localised parts of:

- The A595 c.1.3km to the southeast;
- The A596 c.3km to the north;
- The B5301 located to the immediate west of the Application Site between the A595 and Aspatria;
- The C Class minor road C2001 c.315m north of the site between Bothel and Gilcrux;
- Unclassified minor road U2278 to the immediate east of the Application Site between the A595 and Plumbland;
- Unclassified minor road U2100 c.970m to the east of the Application Site between the A595 and Threapland;
- Unclassified minor road U2101 c.1.7km to the southeast of the Application Site between the A595 and Sunderland hamlet; and
- Unclassified minor roads U2083, U2084, U2085, U2279, U2086, U2081 a short distance to the north of the Application Site in the vicinity of Plumbland and Arkleby villages.

Railway Lines

5.23 The Cumbrian Coast Railway Line passes approximately c.2.4km to the northwest of the site across the study area.

6 PROPOSED DEVELOPMENT AND MITIGATION

Proposed Development

6.1 The proposed minerals development, subject to this landscape and visual assessment is located at High Close, near Parsonby, approximately 2.4km to the south of Aspatria, accessible via the B5301. In summary the Proposal comprises the following:

- Access into the site would be located to the immediate south of the western edge woodland block;
- The extraction of limestone mineral would be over five operational Phases within the land to the immediate west of the former High Close Quarry and landfill site. The extraction extent would be 11ha, progressively worked north to south;
- During Phase 1 operations undertake the construction of final restoration screen bunds in areas to the north of the proposed void and north east of the proposed stockpiling and processing area. The required mitigation native woodland planting, some of which located on the screen bunds, old landfill site and land east of the Phase 4 – 5 area would also be all implemented during Phase 1;
- Until the end of Phase 2 operations the stockpiling and processing area would be located to the immediate east of the former High Close Quarry and landfill site. Post Phase 2 operations the stockpiling and processing area would primarily be located within the working void, with the exception of the site offices, weighbridge and product storage area, which would be retained outside the void, screened by vegetated bunding, although with a hardstanding of reduced extent;
- Undertake non-yield material tipping and progressive restoration to agricultural grassland during operational Phases 2 – 3 within the eastern parts of the site adjacent to the proposed site offices and weighbridge location;
- Following agreement with Northern Gas Networks (NGN) diversion of the existing gas pipeline during Phase 3A operations, which crosses the central parts of the site from east to west;
- Progressive phased restoration leading to the final restoration scheme incorporating partial backfilling of the working void with non-yield mineral material to an afteruse comprising calcareous grassland, native scrub vegetation, ephemeral wetland areas, marginal aquatic vegetation and areas of bare rock habitat. Native woodland and restoration to agricultural grassland would be undertaken within parts of the site outside the proposed void extent.

6.2 A full description of the Proposal is outlined in Chapter 2 of the Environmental Statement and illustrated on the Environmental Statement Figures 8 - 15. The operational phase of the proposed development is considered to be long term as it would be until 22nd February 2042 (approximately 21 years), but not permanent and partially reversible due to the restoration Proposal.

Proposed Mitigation

6.3 The proposed landscape and visual mitigation proposed comprises:

- Construct screen mounds during Phase 1 operations;

- The former High Close Quarry and landfill site would be dressed with additional soil material to allow for native woodland planting;

- During Phase 1 implement replacement native tree planting comprising 10.7ha as mitigation for the 1.12ha proposed loss woodland on the western boundary in Phases 1-2. This mitigation woodland planting would also, in the medium to long term, provide a degree of visual containment to site operations;

- In Phase 1, further enhancements include strengthening existing field boundary hedgerows and tree vegetation in poor condition within and on the peripheral edge of the permission boundary which would remain undisturbed.

- The final restoration would provide an increase in landscape and habitat bio-diversity however the site would be restored to a lower level than the pre-developed profile.

7 ASSESSMENT OF LANDSCAPE EFFECTS

Landscape Sensitivity

7.1 The following section considers the direct and indirect landscape effects of the Proposal. The assessment of landscape effects considers the temporary but long term effects which would occur during the operational Phases and the potential residual effects after restoration relating to:

- The potential effects on landscape fabric within the site; and

- The potential effects on landscape character, including consideration of any effects within designated areas.

7.2 The sensitivity of the local landscape combines judgements of susceptibility to the potential change brought about by the Proposal and the value attached to the landscape. The receiving landscape character sub-type 5a: Ridge and Valley, based upon its medium / high value and medium susceptibility to the proposed development is considered to be of medium / high sensitivity.

7.3 The receiving landscape character sub-type 12b: Rolling Fringe, based upon its high value due to its location adjacent to the Lake District National Park and medium susceptibility to the proposed development is considered to be of high / medium sensitivity. For further detail regarding the sensitivity of the receiving landscape to the Proposal, see LVIA Appendix 3: Landscape Sensitivity Assessment.

Potential Effects on Landscape Fabric

7.4 The following identifies the direct effects on the landscape fabric during the operational Phases of working as illustrated on Indicative Quarry Development Plans, Environmental Statement Figures 8 – 15 and also the residual effects post restoration.

7.5 A detailed description of the proposed scheme of working is presented in Chapter 2 of the Environmental Statement.

Landscape Fabric Operational Effects

7.6 The operational effects of the High Close Quarry Proposals upon landscape fabric are considered in the context of their duration, extent and sensitivity of these elements in the landscape. The detail of loss and gain of landscape fabric per phase is noted on the Indicative Quarry Development Plans, Environmental Statement Figures 8 – 15.

7.7 During Phase 1, there would be a loss of nearly 0.63ha of woodland, but 10.7ha of new woodland planted. There would be just over 43m of hedgerows lost but 500m replanted, as well as enhancements to all hedgerows on site to be retained undisturbed. There would be a loss of 17.26ha of agricultural land. In addition, there would be 0.19ha of the working benches restored to native scrub and calcareous grassland. During Phase 2, there would be the loss of nearly 0.55ha woodland, but the replanting of 0.61ha of native woodland. There would also be approximately 188m of hedgerows and 2.3ha of agricultural grassland lost. The eastern area tipping would temporarily remove just over 1.9ha of agricultural grassland, but it would be returned to agricultural grassland by the end of Phase 2 as part of progressive restoration. Nearly 0.44ha of former working benches would be restored to native scrub and calcareous grassland. The gas pipeline diversion would be a temporary disturbance to the agricultural grassland.

7.8 During Phase 3, the deeper working of the void extent would result in no loss of landscape fabric. Instead, restoration of the processing area outside the void would result in the addition of nearly 2.5ha of agricultural grassland, over 342m of hedgerows and 0.72ha of native woodland and calcareous grassland.

7.9 Phase 4 operations would extend the void to the south. Accounting for the screen mound to the immediate east and the site access track diversion the landscape fabric loss would be 7.44ha of agricultural grassland and 247m of hedgerows. However, progressive restoration would result in restoration of 2.78ha to calcareous grassland, and bare rock habitat, and native scrub with a 0.58ha waterbody with marginal aquatic vegetation.

7.10 The Phase 5 final extraction operations would simply deepen the Phase 4 extent of the working void and there would be no loss of landscape fabric. The progressive restoration would result in the addition of 2.17ha of calcareous grassland, native scrub and bare rock habitat, and 0.65ha of ephemeral water bodies.

7.11 Throughout the Phase 1 – 5 operations approximately 15.4ha of agricultural grassland and 1.48ha of native woodland within the dormant permission boundary would be retained undisturbed.

7.12 Whilst there would be no loss of highly valued elements of the landscape fabric, the existing landscape elements on the proposed site contribute to the fabric which is in keeping with the wider landscape character and form a key characteristic. The new replacement landscape elements would take time to establish and contribute to landscape character and therefore the loss would be immediate and the mitigation would take time to become effective. However, those elements proposed to be added in the early phases, would begin to contribute to the landscape during the timescale of the Operational Phases.

7.13 The direct temporary effect of each operational Phase on the area in which extraction and overburden / non-yield material placement would take place is considered to be substantial in magnitude, although progressive in nature. However the progressive restoration of the site has kept the extent of these effects to a minimum within the Proposal.

7.14 Overall, the operational phases 1 – 5 would consist of the phased loss of established native woodland (1.12ha), agricultural grassland (27.36ha) and 478m of hedgerows, balanced against the proposed phased restoration comprising newly planted 17.5ha of native woodland, 11.18ha of calcareous grassland, scrub, 1.28ha of ephemeral waterbodies with aquatic vegetation and 1,500m of hedgerows. Consequently, when compared with the extent of similar landscape fabric present within the surrounding landscape, the temporary effect upon landscape fabric for the full extent of the Proposal, accounting for the 'Parish' value of the landscape fabric (Stated in the Ecology Assessment), would be slight in magnitude and of moderate – moderate / minor significance **(not significant)**.

Landscape Fabric Residual Effects

Table 3: Landscape Fabric Residual Effects

Full Site	Agricultural Grassland (Hectares)	Agricultural Grassland to be Retained Undisturbed (Hectares)	Native Woodland (Hectares)	Woodland to be Retained Undisturbed (Hectares)	Field Boundary Hedgerows (Linear m)	Calcareous Grassland, Scrub and Bare Limestone (Hectares)	Ephemeral Water Bodies with Aquatic Vegetation (Hectares)
Final Restoration *(Inc. proposed woodland outside Dormant Permission Boundary. Excluding undisturbed areas)*	4.97ha	N/A	17.5ha	N/A	1,500m	11.18ha	1.28ha
Total *(Compared to the existing landscape)*	**27.36ha loss**	**15.4ha**	**14.9ha gain**	**1.48ha**	**1,022m gain**	**11.18ha gain**	**1.28ha gain**
Dormant quarry permission boundary 50.14ha (Including the 0.73ha of High Close Farm extent to be retained undisturbed) / the 0.93ha of native Woodland Planting outside the Dormant Quarry Permission Boundary immediately south of High Close Farm. **Total: 510,656.78m2 / 51.06ha**							

7.15 The void would be partially backfilled to a maximum gradient of 1:3 with intermittent former working faces retained. The final restoration would restore the site to a landscape profile partially in keeping with the surrounding landscape. The retention of parts of the former working void and exposed limestone faces would be adverse in nature, as this is not a key characteristic of these landscape types. However, it is in keeping with adjacent landscape types comprising the limestone fringes of the Lakeland Fells.

7.16 With regard to afteruses the High Close Quarry final restoration would return only parts of the site to agricultural land and native woodland, although the core of the former working void would be returned to calcareous grassland with areas of bare rock habitat, scrub and ephemeral water bodies. This would provide biodiversity net gain regarding the nature conservation value of the site and establish links with surrounding existing habitats.

7.17 When compared to the existing situation, the Proposals would reduce the extent of agricultural grassland by 27.36ha, increase the presence of native woodland by 14.9ha and increase field boundary hedgerows by 1,022 linear metres. Areas of calcareous grassland

and bare rock habitat would increase by 11.18ha. The diversification of habitats would introduce nearly 1.28ha of open water and marginal aquatic landscape.

7.18 The residual loss of characteristic agricultural land could be considered adverse, however the increase in landscape biodiversity and increased ecological value is in line with landscape guidelines for mineral development restoration within the landscape character sub-type 5a: Ridge and Valley. The main feature of ecological interest in landscape character sub-type 12b is located just over 1km to the south of the proposal and is of international importance. The Proposal would restore the landscape to a similar fabric to the former quarry site which is now of ecologically importance.

7.19 The overall residual direct effects upon landscape fabric would be slight in magnitude and of moderate significance **(not significant)**.

Potential Effects on Landscape Character

7.20 The following paragraphs identify the effects of the Proposals on the existing landscape character types / areas within the study area (Refer to LVIA Figures 2 & 7).

7.21 The site is located within landscape character subtypes 5a Ridge and Valley and 12b Rolling Fringe. The assessment of the sensitivity of the subtypes to minerals development (See LVIA Appendix 3) concludes that the landscape subtypes are considered to be of medium – high sensitivity. The operational effects are considered to be long term in nature (not permanent) but partially reversible.

<u>Direct Operational Effects on LCT 5a Ridge and Valley</u>

7.22 The temporary effects upon the Ridge and Valley landscape character subtype would occur where the proposed operations would be visible. The Zone of Theoretical Visibility (ZTV) analysis (refer to LVIA Figures 2 & 7) indicates there would be potential visibility within localised areas to the north and northeast of the site out to and beyond approximately 3km. There would be little or no visibility within the study area to the west of the site.

7.23 Within the immediate vicinity of the site to the north (See Photographs 1, 3 & 5) out to approximately 700 – 800m visibility would primarily comprise the Phase 1 works constructing the screen mound north of the void and immediately west of High Close Farm, which would be planted with native woodland, be grass vegetated and predominantly screen visibility of the remaining extraction operations proposed. Beyond Phase 1 operations there would likely be partial or no visibility of site operations including vehicle movements and the processing / storage area.

7.24 Within the immediate vicinity of the site to the northeast out to approximately 500m where open views present, visibility would include the Phase 1 construction of the screen mounds north of the void and processing area and potentially filtered visibility of the upper northern parts of the proposed working void (approximately the Phase 2 extent). Visibility would be intermittent also due to the ascending landscape profile to the south and intervening tree and shrub vegetation.

7.25 Beyond approximately 1km – 2km to the north and northeast visibility would be predominantly of the upper edge of the progressive working void and potentially the site partially filtered due to localised tree and shrub vegetation and the undulating landscape profile. Whilst it would increase in extent over the operational duration (See Photographs 8, 12 & 13) the mitigation tree vegetation establishment would reduce the influence of the quarry over time.

7.26 Between 2km – 3km and beyond the study area intermittent distant visibility (See Photographs 14 & 16) would predominantly be from open panoramic elevated locations. Visibility would comprise the operations relating to the construction of the soils and overburden screen mounds during Phase 1 and the initial soil stripping and extraction operations. The Phase 1 – 2 stockpiling and processing area and eastern site tipping area would be visible and the retained site office and product storage area screen bund, post Phase 2. The mitigation tree vegetation after establishing would partially reduce the influence of the quarry. The site operations would form a minor feature in the open panoramic landscape views characteristic of this landscape type where experienced. Within the north western edge of the study area (See Photograph 15) the proposed working void would predominantly be screened by the existing western boundary mature woodland. The main operational features visible would potentially be the upper parts of the stockpiling and processing area and the plant undertaking the eastern area tipping potentially, partially filtered by existing and the proposed mitigation tree planting.

7.27 Within the immediate vicinity of the site, where operations would be visible (primarily areas to the north and northeast out to approximately 800m) the effects upon landscape character would be substantial in magnitude and of major – major / moderate significance **(Significant)**. Within the remaining parts of the character sub-type, intervening tree and shrub vegetation would reduce the noticeable change which would become a more limited scale and extent. The effect upon remaining areas of landscape character sub-type 5a Ridge and Valley would be adverse in nature, moderate in magnitude and of moderate significance **(not significant)**.

<u>Direct Operational Effects on LCT 12b Rolling Fringe</u>

7.28 The Zone of Theoretical Visibility (ZTV) and site verification analysis (refer to LVIA Figures 2 & 7) confirmed there would be potential inter-visibility predominantly within the immediate vicinity of the site out to approximately 1km to the south (See Photographs 2, 4, 6 & 9). The remaining potential inter-visibility would be concentrated to the east of the site out to Wharrels Hill approximately 2.5km – 3km from the site (See Photographs 7, 10 & 11). Site verification confirmed that there would be little or no visibility from the landscape to the west.

7.29 Within the landscape to the immediate east of the site (See Photographs 2, 7 & 10) out to approximately 1km, visibility (intermittently filtered) would include the site access, the upper parts of the progressive minerals extraction and quarry working faces. The eastern area tipping and processing and stockpiling area would be partially screened by vegetated bunding. By approximately Phase 3 the mitigation woodland planting to be located on the old landfill site and east of Phase 4 – 5 operations would have established and would heavily filter visibility of the Phases 1 – 3 upper void edge. With Phase 4 and 5 not being undertaken at this stage the southern parts of the site would be as existing resulting in the effects primarily consisting of visibility of the upper parts of the site weighbridge and office area and the final eastern area tipping prior to restoration to agricultural grassland.

7.30 From more distant elevated locations to the east the visibility would be more open but the site would be of a reduced horizontal extent. The nature of the proposed operations visible would be similar as that described above but at a greater distance and therefore having less influence on landscape character locally.

7.31 Visibility from the immediate vicinity of the site to the south out to approximately 1km would, due the landscape profile descending to the north predominantly comprise the partially screened upper parts of the stockpiling and processing area, and eastern tipping area. With the exception of the vicinity of the upper parts of Moota Hill (See Photograph 9) and the landscape to the immediate southwest of the site (Parsonby Brow) visibility of the extraction operations would be concentrated to primarily to Phases 4 and 5. From Moota Hill the southern edge of Phase 1 – 2 extraction operations would be potentially be visible.

7.32 Within the immediate vicinity of the site, where operations would be visible (primarily areas to the south and east out to approximately 500m) the effects upon landscape character would be substantial in magnitude and of major – major / moderate significance **(Significant)**. However, due to localised visual containment of the landscape within the remaining parts of the character sub-type the change would be much less noticeable and effect upon landscape character sub-type 12b Rolling Fringe would be adverse in nature, moderate / slight in magnitude and of moderate significance **(not significant)**.

<u>Direct Residual Effects on LCT 5a Ridge and Valley and LCT 12b Rolling Fringe</u>

7.33 The primary residual post restoration effects would be a reduction in the extent of agricultural grassland, an increase in the native woodland, field boundary hedgerows, naturally regenerated scrub, calcareous grassland, bare limestone, and ephemeral waterbodies. The proposed restoration native woodland, hedgerow bound pasture fields and tree clumps would be in accordance with the key characteristics of these landscape character sub-types. The presence of areas of bare limestone and former working quarry faces would be slightly adverse, although relate to the strong associations the landscape has with nearby limestone fringes of the Lakeland Fells.

7.34 Overall the potential direct residual post restoration effects on the landscape character subtypes 5a Ridge and Valley and 12b Rolling Fringe are considered to be slightly adverse in nature. The effects would be moderate – slight in magnitude and of moderate significance **(not significant)**.

<u>Indirect Operational Effects on LCT I Upland Limestone Farmland</u>

7.35 The Zone of Theoretical Visibility (ZTV) highlights potential visibility from discrete elevated locations approximately 1.5km – 2.5km to the southeast of the Proposal. As this landscape character type (the Lake District National Park Landscape Character Assessment and Guidelines (SPD), Revised April 2021) is located in the Lake District National Park it is a landscape of high sensitivity (high value and susceptibility). Site verification confirms that visibility would be predominantly of the upper parts of initial extraction operations during Phases 1, 2 and 4 and the presence of the processing and stockpiling area screen bund, site access and potentially the upper parts of screen bunded processing plant prior to Phase 3 operations. The progressive eastern area tipping during Phases 2 and 3 would be partially visible also. The proposed mitigation woodland planting may partially filter views in the long term. Due to the elevated open panoramic views but the minor extent of visibility, the influence within the landscape character type of the operational effects would be limited and of slight magnitude and of moderate significance **(not significant).**

7.36 There would be no visibility from the remaining landscape character types within the assessment study area.

Indirect Residual Effects on LCT I Upland Limestone Farmland

7.37 The indirect residual effects would comprise visibility of a small scale and geographic extent of the upper western edge of the former working void, the presence of bare rock habitat, calcareous grassland and an increase in native woodland and scrub vegetation present surrounded by improved agricultural grassland. The residual indirect effects compared to the existing undeveloped site would be slightly adverse in nature, although due to the extent of site visible from the discrete elevated open panoramic location the effects would be of slight - negligible magnitude and of moderate - minor significance **(not significant).**

Potential Effects on Landscape Designations

The Lake District National Park (LDNP)

7.38 The Lake District National Park (LDNP) is a landscape of high value and is located approximately 1.1km to the southeast of the site at its closest point and occupies the south eastern edge of the study area. The physical integrity of the LDNP as a whole would remain intact as a result of the Proposal with the potential for indirect effects only.

7.39 The Zone of Theoretical Visibility (ZTV) indicates potential visibility across a minor elevated extent of the northern edge of the National Park adjacent to the A595. From this discrete location the partially visibility of operations would primarily be the upper parts of initial extraction operations during Phases 1, 2 and 4 and the presence of the processing and stockpiling area screen bund, site access and potentially the upper parts of processing plant prior to Phase 3 operations. The progressive eastern area tipping during Phases 2 and 3 would be partially visible also. The proposed mitigation woodland planting may partially filter views in the long term. The site operations would form a relatively minor feature of open panoramic visibility present from the discrete locally elevated location. The operational effects upon the Lake District National Park due to the small scale and geographic extent would be slight magnitude and of moderate significance **(not significant).**

7.40 The residual effects post restoration would comprise, due to the mitigation and final restoration woodland planting, partially filtered visibility from the discrete elevated location adjacent to the A595 of the upper parts of the former working face along the western edge. Also, a slight profile change to the agricultural grassland within the eastern parts of the site, an increase in native woodland, field boundary hedgerows and the presence of calcareous grassland, native scrub and bare rock habitat. The predicted residual indirect effects upon the LDNP due to the limited extent where visibility would be obtained, proposed landscape profile and afteruse would be slightly adverse in nature, although of slight - negligible magnitude and of moderate - minor significance **(not significant).**

8 ASSESSMENT OF VISUAL EFFECTS

8.1 This section considers the extent of potential visibility with the sensitivity of each receptor and the resulting visual effect from changes in views that would be experienced. The visual effects of the Proposal during the operational effects and residual (post restoration) effects, as described in the Scope of Assessment section of this report (paragraph 2.7). It is assumed that any effects are considered to be adverse, unless stated otherwise.

Residents

8.2 For the purposes of this assessment, unless stated otherwise residential receptors in the study area are considered to be of high sensitivity. This is as a result of their high susceptibility and high value of their views in this rural area. Please refer to LVIA Figures 5, 8 & 9).

High Close Farmhouse

8.3 High Close Farmhouse is located immediately adjacent to the north eastern parts of the dormant permission boundary. The attached neighbouring farm barns and buildings to the east and west provide visual enclosure of the Proposal in views from the dwelling to the east and west. Views to the south due to the garden profile would predominantly be from the upper floor rear windows. During Phase 1 0.93ha of final restoration / mitigation woodland would be planted within the land immediate north of the screen mound descending to High Close Farmhouse. The Proposal would result in filtered views due to dense garden vegetation of the Phase 1 screen bund north and northwest of the processing area and potentially parts of the processing area screen bund construction. During Phases 2 and 3 there would be potential partial likely heavily filtered views of the proposed tipping primarily concentrated to the upper parts where it would integrated with the screen mound, where active site plant would be potentially visible. During Phase 1 – 3 operations the visual effects would be of substantial – moderate magnitude and of major – major / moderate significance **(significant).** Beyond Phase 3 during the remaining proposed operations there would be little or no views and all Phase 1 mitigation tree planting north of and over the screen mound immediately south and southwest of High Close Farmhouse would be well established. Overall the temporary operational visual effects would be slight in magnitude and of moderate significance **(not significant)**.

8.4 The residual effects post restoration would result in an increase in extent of native woodland present in views from the rear of the property to the south, southwest and a slight variation to the agricultural grassland profile. There would be little or no views of the remaining parts of the restored site. The predicted visual effects would be neutral in nature, of negligible magnitude and of minor significance **(not significant)**.

Adams Ghyll

8.5 Adams Ghyll is a south facing detached property located approximately 480m to the northeast of the Proposal to the south of Plumbland off the U2278 road. The Proposal would result in predominantly upper floor front and gable end partially filtered views of the Phase 1 north of the proposed void tree vegetated screen bund construction and potentially a minor extent of the northern edge of the Phase 2 initial soil stripping and extraction operations. During Phase 1 and 2 operations the medium to long term visual effects would be of moderate magnitude and of major / moderate significance **(significant)**. Beyond Phase 2 – 3 after the establishment of the screen mound grassland and tree vegetation there would be little or no views of the remaining operations. The mitigation Phase 1 tree planting would by approximately the end of Phase 3 operations largely screen views of the upper parts of the Phase 2 former working face. There would be little or no views of the processing area or eastern parts of the site scheduled to be tipped in Phases 2 and 3. Overall the temporary operational effects would be slight - negligible in magnitude and of moderate – minor significance **(not significant)**.

8.6 The residual effects post restoration would result in an increase in the extent of native woodland present in views west and a reduction in agricultural grassland. There would be little or no views of the restored former working faces. The predicted residual visual effects would be overall neutral in nature, of slight – negligible in magnitude and of moderate - minor significance **(not significant)**.

Plumbland Village

8.7 Plumbland village is located approximately 500m to the northeast of the proposed minerals development extent. The potential visual effects of the Proposal would be predominantly concentrated to the residents of Muslins cul-de sac where some filtered ground floor and open upper floor views would be experienced (The vicinity of Photograph 3) of the construction of the Phase 1 tree vegetated north and north east of void screen mound and potentially a minor extent of the upper edge of the Phase 1 and 2 working void. Up to the end of Phase 1 the potential operational effects would be substantial in magnitude and of major significance **(significant)**. Beyond Phase 2 - 3 after the establishment of the screen mound grassland and tree vegetation the effects would be predominantly little or no views of the remaining operations. The overall effect upon these Muslins cul-de-sac residents accounting for the duration and magnitude of change would be slight in magnitude and of moderate significance **(not significant)**.

8.8 The remaining residents of Plumbland would experience heavily filtered views of parts of the Phase 1 screen mound construction from the residents immediately adjacent to Muslins cul-de-sac and the U2287; and partial predominantly filtered views of the Phase 1 north of the processing area tree vegetated screen bund construction from a small number of properties in the vicinity of Baglan House. The Phase 1 - 2 operational effects upon these residents due to the nature of views would be slight in magnitude and of moderate significance **(not significant)**. There would generally be little or no views of the Proposal from the remaining residents, although occasional residents may experience upper floor likely filtered views of parts of the Phase 1 – 2 upper working faces prior to the establishment of the native woodland mitigation establishment on the old landfill site. The overall operational effects upon the residents of Plumbland would be slight in magnitude and of moderate significance **(not significant)**.

8.9 The residual effects upon the small number of residents where views experienced would be an increase in the extent of native woodland present, a slight variation to the landscape profile and potential largely filtered views during winter months of minor extents of the former working face potentially. The predicted residual visual effects would be overall neutral in nature, of slight – negligible in magnitude and of moderate - minor significance **(not significant)**.

Parsonby Hamlet

8.10 Parsonby hamlet is located approximately 500m to the north of the proposed mineral development. The operational effects as a result of the proposed mineral development would be generally experienced by residents of Croft View within the southern parts of the hamlet, the residents to the west of the B5301 north of Inglewood Gardens and the residents of The Green property, on the northern edge of the hamlet. The dwellings south of Inglewood Gardens including the Horse and Jockey Public House are largely visually contained due to the Croft View properties. The eastern parts of Croft View, Solway View near the School are also largely visually contained due to woodland to the immediate south.

8.11 The predicted operational effects upon the residents of Croft View (approximately 10 properties) and the residents (approximately 7 properties) to the west of the B5301 north of Inglewood Gardens property (See Photograph 5 and LVIA Figure 9) would be filtered ground floor and more open upper floor views. The residents of Croft View would experience direct views from the rear of the properties. The residents adjacent to the B5301 would be east facing and experience oblique views partially screened by Croft View. The residents of The

Green property would experience direct upper floor front views partially screened by the Croft View properties.

8.12 The views would be of Phase 1 operations regarding the construction of the north and north east of void tree vegetated screen mounds. There would be little or no views of the proposed eastern site tipping area. Potential partial views of the upper parts of the temporary site processing area prior to Phase 3. The operational effects during Phase 1 on these residents would be substantial in magnitude and of major significance **(significant)**. Beyond Phase 1 to Phase 2 the working void would be screened and the views predominantly comprising the upper parts of the temporary processing area. These effects would be moderate in magnitude and of major / moderate significance **(significant).** During and after Phase 3 operations when the processing operations would be in the void and the Phase 1 mitigation tree vegetation established, the effects would be predominantly little or no views of the remaining operations. The overall effect upon Parsonby hamlet would be slight in magnitude and of moderate significance **(not significant)**.

8.13 The residual post restoration effects would result in an increase in the extent of native woodland forming the skyline to the north. The size and scale of change would be small and extent of view affected medium. The residual effects upon residents would be neutral in nature, slight in magnitude and of moderate significance **(not significant)**.

<u>Arkleby Village</u>

8.14 Arkleby village is located approximately 885m to the north of the site on the B5301. Views of the site operations, mainly from upper floors would be predominantly filtered views by localised and intervening tree and shrub vegetation of the Phase 1 north and north east of the void screen bund construction. The initial upper parts of the Phase 1 extraction would potentially be partially present in views also including the upper parts of the processing plant up to Phase 3 operations. Accounting mitigation which is likely to become effective during Phases 2 – 3 the size and scale of change would be small and the extent of view affected would also be small. The duration would be medium to long term and the magnitude of change would be slight magnitude and the operational effects of moderate significance **(not significant).** Beyond Phases 2 - 3 accounting for the establishment of the Phase 1 mitigation tree planting establishment residents would experience little or no views of the working quarry.

8.15 The residual effects would result in an increase in woodland presence with the filtered views. The size and scale of change and extent would be negligible. The residual effects upon residents would be negligible in magnitude and of minor / none significance **(not significant)**.

<u>Threapland hamlet</u>

8.16 Threapland hamlet is located approximately 1km to the northeast of the Proposal. Due to localised mature woodland and the surrounding landscape profile residents would experience little or no views of the proposed development resulting in operational effects of negligible magnitude and minor / none significance **(not significant)**.

8.17 The residual effects post restoration due to the little or no views of the site would be neutral in nature and of minor / none significance **(not significant)**.

Threapland Lees Farmhouse

8.18 Threapland Lees Farmhouse is located approximately 1.26km to the east of the site (See Photograph 10, approx. location). The farmhouse is northwest facing with oblique views towards to proposed site with an adjoining farm building to the west. The residents would experience oblique views towards the upper parts of the Phase 1, Phase 2 extraction operations and the site processing area and parts of the Phase 2 – 3 tipping area. By Phase 3 the mitigation tree planting on the old landfill site would largely filter the views of the Phase 1 – 3 working area and the processing plant would be in the void and all eastern tip areas restored, resulting in minor views of the site office and weighbridge screen bund. For the remaining operations primarily the western edge of the Phase 4 extraction extent upper working faces would be largely screened / filtered due to the Phase 1 mitigation tree planting located east of Phase 4 extraction area. The size and scale of change and the extent of view affected, due to the open panoramic views present and oblique positioning of the site would be small. The duration would be long term. The resulting magnitude of change would be slight and the operational effects of moderate significance **(not significant)**.

8.19 The residual post restoration effects would result in potential winter heavily filtered views of the upper parts of the Phase 4 and 5 western edge comprising former working faces with native scrub vegetation. There would be an increase in extent of native woodland and a slight reduction in the extent of agricultural grassland visible. The size and scale of change would be small and the extent of view affected small due to the open panoramic views present and oblique positioning of the site. The duration would be permanent. The resulting magnitude of change would be slight and the residual effects of moderate significance **(not significant)**.

Oughterside and Prospect Villages

8.20 Oughterside and Prospect villages are located approximately 3.2km – 3.6km to the northwest of the site (See Photograph 15). Residents on the southern edge of Oughterside and Prospect would experience temporary distance open views of the Phase 1 screen mound construction. Also, the upper parts of the processing area up to Phase 2 - 3 and vehicle movements prior for the establishment of the Phase 1 mitigation native woodland planting. Due to the western boundary woodland retained there would be little or no views of the proposed working void. The size and scale of change and the extent of view affected, due to the open panoramic views present would be negligible. The duration would be medium to long term. The resulting magnitude of change would be negligible and the operational effects of minor significance **(not significant)**. Beyond Phases 2 - 3 accounting for the establishment of the Phase 1 mitigation tree planting establishment residents would experience little or no views of the working quarry.

8.21 The residual effects post restoration would be an increase in the extent of native woodland with little or no views of the former working faces. The size and scale of change and extent would be negligible. The residual effects upon residents would be negligible in magnitude and of minor / none significance **(not significant)**.

Aspatria Town

8.22 The town of Aspatria is located approximately 2.7km to the north of the proposed minerals development extent. Views towards the Proposal would be predominantly experienced from the residents located on the southern fringe of the town south of the B5299, the town main street (See Photographs 14 & 16) and in the vicinity of the rugby club adjacent to the B5301. The Proposal would result in distant views of the Phase 1 screen mound construction and potentially partial views of Phase 1, 2, 3, 4, 5 extraction operations. The temporary site processing area and eastern tipping area would be partially visible in views. Upon establishment of the Phase 1 mitigation woodland planting the Phase 4 - 5 extraction operations would be generally filtered views. The size and scale of change and the extent of view affected due to the open panoramic views present would be small. The duration would be long term and the magnitude of change would be slight. The operational effects would be of moderate significance **(not significant)**.

8.23 The residual effects post restoration would be a minor extent of increased native woodland in the open panoramic views south, with potential filtered views of minor parts of the upper parts of the former working faces. The size and scale of change would be small and geographical extent negligible. The residual effects upon residents would be neutral in nature, slight - negligible in magnitude and of moderate – minor significance **(not significant)**.

8.24 The operational and residual effects upon the hamlet of Harriston located a short distance to the east of Aspatria and all localised isolated dwellings and farmsteads would be as above due to the similar open panoramic views present and nature of impact.

Recreation

8.25 For the purposes of this assessment, unless stated otherwise recreational receptors in the study area are considered to be of high sensitivity. This is as a result of the high susceptibility and medium / high value of views in this rural area. LVIA Figures 1, 3 and 6 illustrate the potential recreational receptors within the 3km study area. There would be no physical effect upon any Public Rights of Way.

<u>Public Rights of Way (PRoW)</u>

Footpath No. 248019

8.26 Users of the footpath 248019 between High Close Farm and the C2001 road (See Photographs 1 & 3) when walking south from the C2001 road during Phase 1 operations would experience open views of the construction of the north and north east of the void screen mound. In the vicinity of the C2001 road (See Photograph 3) during the initial stages, the Phase 1 soil stripping and initial extraction prior to screen bund completion would be partially visible and potentially the upper parts of the processing plant. Footpath users walking north from High Close Farmhouse after approximately 110m would have no views of the Proposal. The effects during Phase 1 - 2 due to the localised large scale, geographical extent and medium – long term duration would be substantial in magnitude and of major significance **(significant)**. Beyond Phase 2 the working void would be largely screened and the views by footpath users travelling south predominantly comprising potentially the upper parts of the temporary processing area. During and after Phase 3 operations where the processing operations would be in the void and the Phase 1 mitigation tree vegetation established, the effects would be predominantly little or no views. There would be little or no views of the remaining operations. The overall effect upon users of footpath 248019 would be moderate - slight in magnitude and of major / moderate - moderate significance **(not significant)**.

8.27 Residual post restoration effects upon footpath users would be a slight change to the landscape profile as a result of the retained screen mound and an increase in the extent of native woodland. The size and scale of change would be small and geographical extent small. The residual effects upon residents would be neutral in nature, slight in magnitude and of moderate significance **(not significant)**.

Footpath No. 248020

8.28 Users of the bridleway 248020 located approximately 360m to the southwest of the proposed minerals development (See Photograph 6) would experience little or no views due to the local landscape profile. The operational and residual post restoration effects would be neutral in nature and of minor / none significance **(not significant)**.

Footpath No. 248021

8.29 Users of the footpath 248021, located approximately 490m to the northwest of the proposed minerals development extent would experience little or no views due to the screening by the western site boundary mature woodland and the landscape profile. The operational and residual post restoration effects would be neutral in nature and of minor / none significance **(not significant)**.

Footpath No. 248018

8.30 Users of the footpath 248018 between the C2001 and U2279 roads, located approximately 495m north of the Proposal (vicinity of Photograph 3) when walking south would experience similar views to users of footpath 248019 above in the vicinity of the C2001. The operational effects during Phase 1 – 2 would be substantial in magnitude and of major significance **(significant)**. Accounting for the establishment of the Phase 1 mitigation woodland planting, which would heavily filter views and the little or no views of the remaining site operations post Phase 3 the overall effects accounting for the duration and magnitude of change would be slight in magnitude and of moderate significance **(not significant)**.

8.31 The final restoration would result in views of an increased extent of native tree vegetation, a slight landscape profile variation and potentially largely filtered views during winter months of a minor extent of the former working face naturally regenerated to native scrub. The residual effects upon footpath users would be neutral in nature, slight in magnitude and of moderate significance **(not significant)**.

Footpath No's. 248004, 248005, 248006, 248007, 248010, 248011, 248012, 248014, 248015 and 248016

8.32 The above footpaths provide connection between Plumbland, Parsonby and Arkleby within approximately 1km to the north of the proposed site. Users of the footpaths when travelling in a northerly direction would experience little or no views of the Proposal. As the footpaths are generally across local agricultural land or pathways bound by hedgerows, tree vegetation and/or adjacent to built development views towards the site would be intermittent. Where experienced when walking to the south east or west the operational views would predominantly be (See Photograph 5) views of the Phase 1 north and north east of the void screen bund construction. There would be little or no views of the proposed eastern site tipping area, although potential partial views of the upper parts of the temporary site processing area prior to Phase 3.

8.33 The initial upper parts of the Phase 1 extraction would potentially be partially present in views from footpaths in the vicinity of Arkleby and north of Plumbland. The size and scale of change as a result of the Proposal would be small and the extent of view affected would also be small. The duration would be medium to long term and the magnitude of change accounting for the intermittent nature of views would be moderate - slight magnitude and the operational effects of major / moderate - moderate significance **(not-significant).** Beyond Phases 2 - 3 accounting for the establishment of the Phase 1 mitigation tree planting establishment footpath users would experience little or no views of the working quarry.

8.34 The residual effects would result in an increase in woodland presence with the filtered views. The size and scale of change and extent would be negligible. The residual effects upon footpath users would be negligible in magnitude and of minor / none significance **(not significant)**.

Footpath No. 248017

8.35 Footpath 248017 is located approximately 670m to the north east of the proposed minerals development. Users of the footpath would experience intermittent generally filtered views over approx. 200m of the south eastern parts of the footpath, although from some areas there would be little or no views of the site due to landscape profile. Users would experience filtered views of parts of the Phase 1 initial extraction works, Phase 4 initial extraction works, the upper parts of the temporary stockpiling and processing area, the Phase 2 – 3 eastern area tipping screen mounds and potentially the upper parts of site plant. The size and scale of change accounting for the largely filtered and slightly intermittent views and extent would be small. The operational effects upon footpath users would be slight in magnitude and of moderate significance **(not significant)**.

8.36 The views post restoration would be filtered views of the additional native woodland, a slight change to the eastern area agricultural grassland profile and the potentially due to the mitigation / restoration woodland planting heavily filtered views of the upper western edge of the former working faces to a minor extent with native scrub vegetation present. The size and scale of change and extent would be negligible. The duration permanent. The residual effects upon footpath users also accounting for the intermittent nature of the filtered views would be negligible in magnitude and of minor / none significance **(not significant)**.

Footpath No. 210015

8.37 Footpath 210015 is located approximately 1.1km to the south of the Proposal on the elevated edge of Moota Quarry (See Photograph 9). Users of the footpath, primarily concentrated to approximately 250m – 300m of the route in the elevated location would have open panoramic views to the north. The operational elements of the Proposal in views would be the initial soil stripping and Phase 1, 2 and Phase 4 extraction operations, the upper parts of the processing area screen bund and plant potentially up to Phase 3 operations and partial views of the Phase 2 – 3 tipping and progressive restoration works. The site access and vehicle movements would be present in views. The size and scale of change would be medium and the geographical extent small. The duration would be long term. The resulting operational effects would be slight in magnitude and of moderate significance **(not significant)**.

8.38 The residual effects would be an increase in native woodland presence, variation to the agricultural grassland extent and profile, a reduction in the western boundary woodland, the upper edges of the scrub vegetated primarily western and eastern former working faces and minor parts the calcareous grassland partially backfilled void. The size and scale of change and extent would be small. The duration permanent. The residual effects upon footpath users also accounting for the extent of the footpath views experienced views would be slight in magnitude and of moderate significance **(not significant)**.

Footpath No. 213005

8.39 Footpath 213005 goes from near Bothel to the U2100 road near Threapland lees Farmhouse, approximately 1.26km from the Proposal. Footpath users would only experience views when walking to the west. On the descent from Wharrels Hill to the U2100, over approximately 950m there would be open elevated views of predominantly the full site extent and associated operations. The Phase 1 mitigation native woodland planting by Phase 3 would provide partial screening of the Phase 1 – 2 void extent and the processing plant would be located within the void. The Phase 1 mitigation planting by Phase 4 – 5 extent would also partially screen later operational phases. Due to the separation distance and open panoramic views the size and scale of change and extent would be small - medium. The duration would be long term. The operational effects upon footpath users where views experienced when walking westbound would be moderate in magnitude and of major / moderate significance **(significant)**. Accounting for the little of no views when using this footpath east of Wharrels Hill and when walking the full extent eastbound from the U2100 the overall operation impact upon users would be slight in magnitude and of moderate significance **(not significant)**.

8.40 The residual effects would result in potential heavily filtered views through mitigation and restoration woodland of the western site edge partially vegetated upper former working faces. There would be an increase in native woodland planting, partially screening the former working faces and slight alteration to the agricultural grassland landscape profile within the eastern parts of the site where the tipping was undertaken. The size and scale of change and extent would be small. The duration permanent. The residual effects upon footpath users would be adverse in nature, slight in magnitude and of moderate significance **(not significant)**.

Footpath No. 213007

8.41 Footpath 213007 is located in the vicinity of Wharrels Wind Farm, approximately 2.7km to the southeast of the Proposal. Over a discrete approximately 200m section of the footpath where it passes through the windfarm open distant views to the site would be experienced (Vicinity of Photograph 11). Similar to Footpath 213005 users would experience views of predominantly the full site extent and associated operations. Due to the separation distance and open panoramic views the size and scale of change and extent would be small - medium. The duration would be long term. The operational effects upon footpath users would be moderate in magnitude and of major / moderate significance **(significant)**. Due to the limited extent of the footpath views would be experienced from the overall operational effects upon users would be slight in magnitude and of moderate significance **(not significant)**.

8.42 The residual effects would be potentially heavily filtered views through the mitigation and restoration woodland of the western former working faces upper parts. There would be an increase in native woodland and slight overall landscape profile change. The size and scale of change and extent would be small. The duration permanent. The residual effects upon footpath users would be adverse in nature, slight in magnitude and of moderate significance **(not significant)**.

Bridleway No. 213002

8.43 Bridleway 213002 is located within the north eastern parts of the study area, approximately 2.4km from the Proposal (Vicinity of Photograph 13). Users would experience regular intermittent views across to the site filtered by intervening localised tree and shrub vegetation. The operational effects would be primarily concentrated to partial intermittent filtered views of the Phase 1, 2 and 4 initial extraction, screen mound construction and potentially the upper parts of the processing area plant up to Phase 3. All other elements of proposed operations would be predominantly out of view. Due to the separation distance and open panoramic views the size and scale of change and extent would be negligible. The duration would be long term. The operational effects upon bridleway users would be negligible in magnitude and of minor significance **(not significant)**. During and after Phase 3 the Phase 1 mitigation planting on the former landfill site and to the east for Phase 4 – 5 area would have established and largely screen views of the upper edges of the Phases 1 – 2 and 4 working faces.

8.44 Post restoration there would be potential distant heavily filtered views of parts of the vegetated upper western former working faces, and an increase in native woodland. The core of the restored site would be out of view. The size and scale of change and extent would be negligible. The duration permanent. The residual effects upon footpath users would, negligible in magnitude and of minor significance **(not significant)**.

Footpaths in the vicinity of Aspatria and Harriston

8.45 Users of the public footpaths on the edge of Aspatria and Harriston would predominantly experience open panoramic views south experience (Vicinity of Photographs 14 & 16). The Proposal would result in distant views of the Phase 1 screen mound construction and partial views of Phase 1, 2, 3, 4, 5 extraction operations. The temporary site processing area and eastern tipping area would be partially visible in views. Upon establishment of the Phase 1 mitigation woodland planting the Phase 4 - 5 extraction operations would be generally heavily filtered views. The size and scale of change and the extent of view affected due to the open panoramic views present would be small. The duration would be long term and the magnitude of change would be slight. The operational effects would be of moderate significance **(not significant)**.

8.46 The residual effects post restoration would be a minor extent of increased native woodland in the open panoramic views south, with potential heavily filtered views of minor parts of the upper parts of the former working faces. The size and scale of change would be small and geographical extent negligible. The residual effects upon footpath users would be neutral in nature, slight - negligible in magnitude and of moderate – minor significance **(not significant)**.

Remaining PRoW's within the Study Area

8.47 There would be little or no operational or post restoration views of the Proposal from the remaining PRoW's within the study area.

<u>Open Access Land</u>

8.48 There would be no operational or post restoration views of the site from the Open Access Land located in Bothel (See LVIA Figures 1 & 6).

Road Users

8.49 For the purposes of this assessment, unless stated otherwise motorists and other road users are of medium sensitivity. This is as a result of their medium susceptibility and medium value of views.

<u>A595</u>

8.50 The A595 primary transport road is located approximately 1.3km to the south of the Proposal and extends across the south eastern parts of the study area. Views of the Proposal would be experienced over approximately 800m when travelling southwest from Wharrels Hill towards Moota (See Photograph 11). Drivers would experience open views of the central and southern parts of the Proposal including the Phase 1, 2 and 4 initial extraction operations, the site processing area bunding, parts of the Phase 1 screen mounds and potentially the upper parts of plant, Phase 2 – 3 tipping area and the site access. After approximately Phase 3 the Phase 1 mitigation woodland planting would have established and partially screen the Phase 1 – 2 and 4 - 5 void extent. The size and scale of change and extent would be small to medium. The duration would be long term. The operational effects upon road users over this section of the route would be of moderate significance **(not significant)**. When traveling eastbound on the A595 road users would experience little or no views of the Proposal.

8.51 The residual post restoration effects upon users of the A595 over approximately 800m when travelling southwest from Wharrels Hill towards Moota (See Photograph 11) would be heavily filtered views through the mitigation and restoration woodland of the upper parts of the partially vegetated western edge former working faces. A large increase in native woodland across the former landfill site and previous agricultural land. A slight change to the agricultural land profile within the Phase 2-3 tipping areas. The size and scale of change and extent would be small. The duration permanent. The residual effects upon road users would be adverse in nature, slight in magnitude and of moderate / minor significance **(not significant)**.

<u>A596</u>

8.52 The A596 is located just outside the 3km study to the north of the Proposal, passing through Aspatria. Road users would predominantly experience little or no views when travelling over approximately 1.8km through Aspatria. In the rural areas to the east and west of Aspatria, intermittent open views south would be experienced. The Proposal would form a minor extent of the open panoramic views and comprise distant views of the Phase 1 screen mound construction and partial views of Phase 1, 2, 3, 4, 5 extraction operations. The temporary site processing area and eastern tipping area would be partially visible in views. Upon establishment of the Phase 1 mitigation woodland planting the Phase 4 - 5 extraction operations would be generally heavily filtered views. The size and scale of change and the extent of view affected due to the open panoramic views present would be small. The duration would be long term and the magnitude of change would be slight. The operational effects upon road users travelling east or west on the A596 outside Aspatria (where little or no views would be experienced) would be of moderate / minor significance **(not significant)**.

8.53 The residual effects post restoration would be a minor extent of increased native woodland in the open panoramic views south, with potential filtered views of minor parts of the upper parts of the former working faces. The size and scale of change would be small and geographical extent negligible. The overall residual effects upon road users of the A595 would be neutral in nature, slight - negligible in magnitude and of moderate – minor significance **(not significant)**.

<u>B Class Road B5301</u>

8.54 The B5301 road passes to the immediate west of the Proposal. When travelling northbound from the A595 road users would experience intermittent views due to roadside vegetation towards the site (See Photograph 4). The views would predominantly comprise the site access, the processing area bunding and upper parts of the plant possibly until Phase 3 and the Phase 2 – 3 tipping operations. Views of the extraction operations would be largely screened and mainly be of site plant undertaking the soil stripping and initial extraction during Phases 1, 2 and 4. Although, when passing the site immediately to the west of the Phase 4 – 5 extraction area, filtered views of the void during Phases 4 – 5 would be experienced over approximately 250m – 300m. Due to the retained native woodland along the western boundary of the Proposal road users travelling north once passing the site entrance would have little or no views of the proposed mineral development. The operational effects upon road users travelling north from the vicinity of Photograph 4 until passing the site entrance would be substantial in magnitude and major / moderate significance **(significant)**.

8.55 When travelling southbound from Aspatria, road users would experience predominantly little or no views of the Proposal until the vicinity of Arkleby, where intermittent views would be experienced, primarily due to the roadside and intervening tree and shrub vegetation. The views would be of the Phase 1 north and north east of the void screen bund construction. The initial upper parts of the Phase 1 extraction would potentially be partially present in views, also the upper parts of the processing plant and screen bund up to Phase 3 operations. When passing through Parsonby (See Photograph 5) and the north western edge of the site on the approach to Parsonby Brow road users would experience intermittent open views of the Phase 1 screen mound construction over approx. 500m. There would be little or no views of the proposed eastern site tipping area. Potential partial views of the upper parts of the temporary site processing area plant prior to Phase 3. The operational effects during Phase 1 on road users travelling south through Parsonby would be substantial in magnitude and of major / moderate significance **(significant)**. Beyond Phase 1 to Phase 2 the working void would be screened and the views predominantly comprising the upper parts of the temporary processing area. These effects would be moderate in magnitude and of moderate significance **(not significant).** During and after Phase 3 operations where the processing operations would be in the void and the Phase 1 mitigation tree vegetation established, there would be little or no views of the remaining operations.

8.56 Overall the operational effects upon users of the B5301 accounting for the above and also extent of the route where no views would be experienced within the study area would be moderate in magnitude and of moderate significance **(not significant)**.

8.57 The residual effects would be predominantly concentrated to the views travelling northbound over approximately 250 – 300m immediately prior to the western boundary woodland. Road users would experience heavily filtered winter month views through the proposed restoration native woodland planting immediately west of the former quarry void. The filtered views would be partially backfilled and established calcareous grassland with bare rock habitat, native scrub and water bodies. The residual effects would be adverse in nature. The size and scale of change and extent would be medium - large resulting in a magnitude of change of substantial – moderate and an effect of major / moderate - moderate significance **(not significant)**.

8.58 The residual effects when travelling southbound in the vicinity of Parsonby and south of the existing western boundary woodland would result in an increase in the extent of native woodland forming the skyline(only part of the skyline south of existing woodland). The size and scale of change would be small and extent of view affected medium. The residual effects upon road users would be neutral in nature, slight in magnitude and of moderate / minor significance **(not significant)**.

8.59 From the wider locations where intermittent views experienced by road users the residual effects would primarily comprise additional native tree vegetation. Accounting for this, the above and the areas of the route where no views would be experienced the overall residual effects upon users of the B5301 would be moderate - slight in magnitude and of moderate – moderate / minor significance **(not significant)**.

C Class Road C2001

8.60 The C2001 road between Bothel and Gilcrux passes within approximately 315m to the north of the Proposal. Road users travelling east and west views of the Proposal would be predominantly visually contained by roadside hedgerow vegetation and the visual enclosure of built development when passing through Plumbland and Threapland. The discrete locations where views would be experienced would be when travelling east crossing the B5301 over approximately 65m. The views would be of the Phase 1 north and north east of the void screen mound construction and potentially the upper parts of the processing plant up to Phase 3 operations. The effects during Phase 1 - 2 due to the localised large scale, geographical extent and medium – long term duration would be substantial in magnitude and of major significance **(significant)**. When travelling west bound on the western edge of Plumbland passing Muslins cul-de-sac views similar in nature to the above would be experienced over approximately 10m (Vicinity of Photograph 3). During and after Phase 3 operations where the processing operations would be in the void and the Phase 1 mitigation tree vegetation established, there would be little or no views of the remaining operations.

8.61 There would be little or no views of the site from the remaining parts of the C2001. When travelling west occasional intermittent gaps in hedgerows would provide heavily filtered partial views of predominantly the upper edge of the western working faces (See Photograph 12). During and after Phase 3 the Phase 1 native tree vegetation planting would have established and provide further screening of the views of the upper edge of the working faces. The size and scale of change and extent would be negligible resulting in a magnitude of change of negligible and an effect of minor / negligible significance **(not significant)**.

8.62 The overall impact upon the C2001 road users within the study area, accounting for the localised nature of effects when passing a short distance to the north of the site and the occasional intermittent heavily filtered minor views from more distant locations, would be slight in magnitude and of moderate / minor significance **(not significant)**.

8.63 The residual effects would primarily be concentrated to the short sections of the route crossing the B5301 and the western edge of Parsonby as described above comprising an increase in native woodland forming the skyline. The size and scale of change would be small and extent of view affected medium. The residual effects upon road users would be neutral in nature, slight in magnitude and of moderate / minor significance **(not significant)**. The overall residual effects upon users of the C2001 would be negligible in magnitude and of minor / negligible significance **(not significant)**.

Unclassified minor road U2278

8.64 The unclassified minor road U2278 passes to the immediate east of the site between the A595 and Plumbland Village. Users of the road travelling north and southbound would experience intermittent views towards the Proposal, primarily where there are gaps in hedgerows and field access gates. Views would be predominantly concentrated to the approximately 420m section immediately adjacent to the site (See Photograph 2). There would be partial views of the processing and stockpiling area screen bund, north of the processing area screen mound and potentially the upper parts of the plant, the Phase 1, 2 and 4 soil stripping and initial extraction operations. Also the temporary screen bund for the Phase 2 – 3 tipping and restoration areas would be immediately adjacent to the road south of the existing woodland near the High Close Farm eastern entrance. It would be an adverse engineered feature, although over approximately 180m would provide screening of all operations for road users travelling north or south. During and after Phase 3 the processing area would be located within the void and the Phase 1 mitigation tree planting would be established on the former landfill site and immediately east of Phase 4 – 5 extent. This would partially screen and heavily filter views of the Phase 1 – 2 extraction extent and of Phase 4 minerals extraction within the southern parts of the site. The predicted operational effects over this section of the route, when travelling north or south would be adverse in nature and substantial magnitude and of major / moderate significance **(significant)**.

8.65 When travelling immediately south from Plumbland, the views from road users would be predominantly screened by roadside hedgerows, although at discrete locations where field gates present there could be very short timescale views of the Phase 1 north of the void screen bund construction and potentially a minor extent of the northern edge Phase 2 initial soil stripping and extraction operations. Beyond Phase 2 – 3 after the establishment of the screen mound grassland and tree vegetation there would be little or no views of the remaining operations. During Phase 1 and 2 operations the visual effects here would be of moderate - slight magnitude and of moderate – moderate / minor significance **(not significant)**.

8.66 The overall operational effects upon road users accounting for the size and scale of change and the extent of approximately 1.7km of the route travelling northbound and southbound where there would be little or no views would be substantial - moderate in magnitude and of major / moderate - moderate significance **(not significant)**.

8.67 The residual effects viewed from the discrete location when travelling south from Plumbland would be an increase in extent of woodland, there would be little or no views of the former working faces. The predicted residual visual effects would be overall neutral in nature, of slight – negligible in magnitude and of moderate – minor – minor / negligible significance **(not significant)**. Over the approximately 420m when passing the former site travelling north or southbound the intermittent residual views would be an increase in the extent of native woodland across the old landfill site and east of the Phase 4 – 5 former working void, an increase in field boundary hedgerows, a slight change to the agricultural land profile and minor winter heavily filtered views through woodland of the upper vegetated edge of the Phase 4 – 5 working void extent. The size and scale of change would be medium and the extent of view affected medium. The timescale would be permanent. The residual effects would be adverse in nature, moderate in magnitude and of moderate significance **(not significant)**.

8.68 The overall residual effects post restoration upon users of the U2278 travelling north or south would be slight in magnitude and of moderate / minor significance **(not significant)**.

<u>Unclassified minor road U2100</u>

8.69 The unclassified minor road U2100 is located at its closest approximately 970m to the east of the Proposal between Threapland and the A595 (See photographs 7, 8 & 10). Users travelling north and south would experience intermittent views towards the Proposal where gaps in roadside hedgerow and tree vegetation, and field gates present. The views where experienced would generally be partially filtered buy intervening tree and shrub vegetation comprising oblique views towards the upper parts of the Phase 1, Phase 2 extraction operations, north and north east of the void screen mounds, the site processing area and parts of the Phase 2 – 3 tipping area. By Phase 3 the mitigation tree planting on the old landfill site and immediately east of Phases 4 – 5 extent would largely screen / heavily filter the views of the Phase 1 – 3 working area and future Phase 4 – 5 operations, and the processing plant would be in the void and all eastern tip areas restored. This would result in minor views of the site office and weighbridge screen bund and for the remaining operations primarily heavily filtered / partial views through woodland of the western edge of the Phase 4 extraction extent upper working faces. The size and scale of change and the extent of view affected, due to the open panoramic views present and oblique positioning of the site would be small. The duration would be long term. The resulting magnitude of change upon road users travelling north and southbound would be slight and operational effects of moderate / minor significance **(not significant)**.

8.70 The residual effects would be intermittent oblique heavily filtered views through restoration woodland (mainly winter months) of short timescale of the upper parts of the western void edge comprising former working faces with native scrub vegetation and a slight reduction in the extent of agricultural grassland visible. The size and scale of change would be small and the extent of view affected small. The duration would be permanent. The resulting overall magnitude of change accounting for the intermittent views would be slight and the residual effects of moderate / minor significance **(not significant)**.

Unclassified minor road U2101

8.71 The unclassified minor road U2101 is located approximately 1.7km from the Proposal within the south eastern parts of the study area between the A595 and the vicinity of Sunderland hamlet. Views of the Proposal would only be experienced when travelling northbound over approximately 400m within the elevated location prior to descending to the A595. The relatively distant views would be intermittently partially filtered by roadside vegetation and predominantly comprise the upper edge of the Phase 1, 2 and 4 soil stripping and initial extraction works. The site entrance would form a minor feature. There would be little or no views of the remaining operations. During Phase 3 the establishment of the Phase 1 mitigation tree planting would largely screen / filter views of the Phase 1 – 2 working void extent and the future Phase 4 – 5 void extent. The size and scale of change accounting for the open views would be small - negligible and the extent of view affected small – negligible. The duration would be long term. The operational effects upon road users would be negligible in magnitude and of minor / negligible significance **(not significant)**. Over the last approximately 250m on the approach to the A595 there would be little or no views of the Proposal due to the local landscape profile.

8.72 The residual post restoration effects upon road users travelling north over approximately 400m on the approach to the A595 would comprise relatively distant views of the increase in native woodland and heavily filtered winter views of the upper vegetated void edges of the Phase 4 extent. The size and scale of change accounting for the open views would be negligible and the extent of view affected negligible. The duration would be long term. The residual effects upon road users would be negligible in magnitude and of minor / negligible significance **(not significant)**.

Unclassified minor road U2083

8.73 The unclassified minor road within the north eastern parts of the study area passing between Threapland and Aspatria. At its closest it's approximately 1.5km from the Proposal. There would only be potential intermittent and occasional views of the Proposal when traveling southbound (See photograph 13) where roadside vegetation gaps and field gates present. The generally filtered mainly distant views would primarily comprise the Phase 1 and 2 soil stripping and the initial Phase 1 and 2 extraction operations, potential upper parts of the site processing plant up to Phase 3 and Phase 1 north and north east of void screen mound. The effects up to Phase 2, where views experienced would be negligible size, scale and extent. The duration would be long term. The operational effects upon road users where occasional views experienced would be negligible in magnitude and of minor /

negligible significance **(not significant)**. During and after Phase 3 the Phase 1 mitigation planting on the former landfill site and east of the Phase 4 – 5 extent would have established and largely screen / filter views of the upper edge of the working faces.

8.74 The residual post restoration effects would be occasional views when driving southbound of an increase in native woodland presence. The remaining parts of the restored site would be largely out of view. The residual effects upon users of the U2083 would be negligible in magnitude and of minor / negligible significance **(not significant)**.

<u>Unclassified minor roads U2279, U2081, U2084, U2085, U2086</u>

8.75 The minor road U2279 is located within Parsonby, between the B5301 and C2001. The road is immediately north of Parsonby properties until the vicinity of joining the C2001 opposite Muslins cul-de-sac, Plumbland. These local minor roads are located within 1km. Road users travelling westbound would experience little or no views of the Proposal. Travelling east bound from the B5301 views would largely be screened by the Parsonby properties to the immediate south. There would be potential views likely screened by the roadside hedgerow over approximately 20m when joining the C2001 (Vicinity of Photograph 3). The views would be of the Phase 1 north and north east of the void screen mound construction and potentially the upper parts of the processing plant up to Phase 3 operations. The effects during Phase 1 - 2 due to the localised large scale, geographical extent and medium – long term duration would be substantial in magnitude and of major significance **(significant)**. During and after Phase 3 operations where the processing operations would be in the void and the Phase 1 mitigation tree vegetation established, the effects would be predominantly little or no views of the remaining operations.

8.76 The overall operational impact upon users of the U2279 accounting for the little or no views when travelling west and the approximately 460m of the 490m route little or no views route when travelling east would be slight in magnitude and of moderate / minor significance **(not significant)**.

8.77 Site verification confirmed there would be little or no views of the Proposal from the U2081 located between the B5301 just north of Arkleby and the north eastern edge of the study area near Blennerhasset, the U2084 located between Plumbland extending north towards Flatts Beck, the U2085 from Arkleby to Oughterside and the U2086 minor road between Wardhall Guards and Arkleby. This is due to the dense nature of the roadside vegetation, intervening tree and shrub vegetation and the local landscape profile.

Railway Line Users

8.78 The Cumbrian Coast Railway Line passes approximately 2.4km to the northwest of the Proposal across the study area. Site verification confirmed that there would be little or no views of the site from users of the railway line.

9 CUMULATIVE EFFECTS

9.1 In terms of potential cumulative effects, it is considered good practice to consider those potential interactions between different developments and the incremental change, which are foreseeable and might affect the decision making of the proposed development. Moota Quarry, operated by Breedon Group is located approximately 900m to the southwest of the Proposal and the key consideration regarding potential cumulative effects. Former Clints Quarry, , is located southeast of the A595, 1.2km – 2km from the Proposal. It is a dormant planning permission and potentially a future development. A Scoping Opinion has been issued by the Lake District National Park Authority. The potential cumulative effects based on the outline strategy have been assessed. There is no certainty that this proposal will progress to planning submission and the nature of the proposal may be subject to change.

9.2 The two sites are located within the Higher Limestone landscape character sub-type 12b: Rolling Fringe. Whilst the Proposal would result in a further reduction in agricultural land, which is a key characteristic, overall the extent would be discrete. Given the separation distance and visual containment of both the sites the increased influence of quarry development to landscape character would only increase to a minor extent. Whilst some cumulative effects would be present, it is considered unlikely that there would be significant cumulative effects upon landscape character as a result of the Proposal in combination with Moota.

9.3 In terms of the cumulative visual effects upon receptors the intervisibility of parts of both quarries would be limited and predominantly concentrated to the following:

- Users of the U2278 (See Photograph 2) immediately adjacent to the Proposal;
- Views southwest from the A595 in the vicinity of Wharrels Hill (See Photograph 11), approximately 2.5km to the southeast of the Proposal;
- Users of the footpath 210015 (See Photograph 9), located approximately 1.1km to the southwest of the Proposal on the elevated edge of Moota Quarry old void;
- The users of the C2100 road (See Photographs 8 & 10) approximately 1.2km to the east of the Proposal; and
- Users of the footpath 213005, which goes from Bothel to the U2100 road near Threapland lees Farmhouse, approximately 1.26km from the Proposal at its closest point.

9.4 The sequential cumulative effects would be concentrated to users of the A595 when travelling west experiencing views of parts of both Moota Quarry and the Proposal at Wharrels Hill (See photograph 11) and then just the Moota Processing plant and buildings, partially screened by vegetation when passing the site entrance. There would be no sequential cumulative effects when travelling east on the A595.

9.5 The receptors with the greatest potential for intervisibility would be:

- Users of the footpath 210015 (See Photograph 9), located approximately 1.1km to the southwest of the Proposal on the elevated edge of Moota Quarry old void; and
- Users of the footpath 213005, which goes from Bothel to the U2100 road near Threapland Lees Farmhouse, approximately 1.26km from the Proposal at its closest point.

9.6 Clints Quarry is predominantly visually contained by mature evergreen tree vegetation. Clints Quarry is located within the Lake District National Park Upland Limestone Farmland Landscape Character Type. The indirect effects from a cumulative perspective due to the limited visibility would not be significant.

9.7 In terms of potential cumulative visibility, the intervisibility would be predominantly confined to the following:

- Elevated crest of Moota Hill / upper parts of footpath 210015, on the edge of Moota Quarry where parts of the Clints Quarry former voids and overburden mound would be visible;

- Users of the A595 in the vicinity of Wharrels Hill, approximately 2.5km to the southeast of the Proposal when travelling westbound. Users of the B5301 when travelling north when passing the proposed High Close Access. Users would experience views of the Clints Quarry old partially vegetated quarry overburden mound only. A minor feature where views are present;

- The users of the C2100 road approximately 1.2km to the east of the Proposal, when travelling north towards the A595. Intermittent partial views of the upper edge of the partially vegetated old top quarry overburden mound. A barely discernible feature in views; and

- Users of the footpath 213005 when travelling from Bothel to the U2100 road near Threapland Lees Farmhouse would experience visibility of Clints Quarry old partially vegetated overburden mound. A minor feature within elevated open panoramic views.

9.8 The sequential cumulative effects would predominantly be experienced only by users of the A595 travelling west experiencing views of the Clints Quarry overburden mound and then in turning north on the B5301 and pass the Proposal site entrance.

9.9 The cumulative intervisibility of the Proposal, Moota Quarry and Clints quarry would predominantly be experienced from:

- Users of the footpath 210015, located approximately 1.1km to the southwest of the Proposal on the elevated edge of Moota Quarry;

- Users of the footpath 213005, which goes from Bothel to the U2100 road near Threapland Lees Farmhouse, approximately 1.26km from the Proposal at its closest point;

- Users of the A595 in the vicinity of Wharrels Hill, approximately 2.5km to the southeast of the Proposal when travelling westbound; and

- The users of the C2100 road approximately 1.2km to the east of the Proposal, when travelling north towards the A595.

9.10 Whilst there would be limited sequential and intervisibility cumulative effects regarding views of the Proposal, Moota Quarry and the former Clints Quarry, they would not be significant.

9.11 As a result of this analysis a detailed cumulative assessment has not been included.

10 LIGHTING

10.1 The proposed summer month operational hours Monday to Friday would be 7am to 6pm (11 hour) and Saturday 7am – 13 noon (6 hour). The predicated Monday to Friday site working hours to minimise the requirement for lighting during winter months (from approx. November to February duration) would be 8am - 5pm. This would result in approximately 1 – 1.5 hours of lighting required primarily in the latter parts of the Monday – Friday working days. On Saturday's it would be 8am – 12 noon. The lighting requirements would potentially be present at the following locations:

- Site offices and weighbridge area;
- Direction lighting on mobile site plant and articulated haulers; and
- Lighting around the access.

10.2 Control measures would be implemented regarding the type and intensity of lights, the cowling around the light and a reduced number of them to limit the impact. It would be low level, small scale external lighting over short timescales during winter months and not associated with extraction operations. The lighting will have a warm white spectrum (<2,700 kelvin) and have a peak wavelength higher than 550nm.

10.3 Significant operational lighting effects on localised landscape and visual receptors are not predicted.

11 SUMMARY AND CONCLUSIONS

Summary

11.1 The Proposal relates to the commencement of the dormant planning permission. The potential landscape and visual effects have been identified and assessed out to an approximately 3km radius from the dormant planning permission boundary. The assessment considers the temporary effects, which would occur during the operational Phase and the residual effects after restoration.

11.2 The LVIA has been reviewed and revised to take full account of the Regulation 22 Schedule (Reg 22) of Further Information Required.

<u>Landscape Fabric (See Environmental Statement Figures 8 - 15)</u>

11.3 The Proposal would result in the loss of approximately 27.36ha of agricultural grassland, approximately 1.12ha of existing native woodland and approximately 478m of existing field boundary hedgerows. The direct temporary effects of each Phase on the area in which extraction and overburden / non-yield material placement would occur would be substantial in magnitude, although progressive in nature. Approximately 15.4ha of agricultural grassland and 1.48ha of native woodland retained undisturbed throughout operations. The temporary effected landscape areas are comparatively small compared to the extent of similar landscape features within the existing surrounding landscape. Consequently, the temporary effect upon landscape fabric for the full extent of the Proposal, also accounting for the Parish value of the landscape fabric (Stated in the Ecology Assessment), the extent of similar features within the localised landscape would be slight in magnitude and of moderate – moderate / minor significance **(not significant)**.

11.4 The Proposal would progressively restore the site to a landscape profile partially keeping with the surrounding landscape. The restoration would create calcareous and agricultural grassland, bare limestone habitat, ephemeral water bodies, marginal aquatic vegetation, native scrub and increase the areas of native woodland and field boundary hedgerows. Overall there would be a 27.36ha loss in agricultural grassland (inc. land outside dormant permission boundary), although diversification of landscapes. The increase in landscape diversity and increased ecological value is in line with landscape guidelines for mineral development restoration within the landscape character sub-type 5a: Ridge and Valley. The main feature of ecological interest in landscape character sub-type 12b is located just over 1km to the south of the proposal and is of international importance. The Proposal would restore the landscape to a similar fabric to the former quarry site which is now of ecologically importance.

11.5 The residual landscape fabric effects would be slight in magnitude and of moderate significance **(not significant)**. So, there would be no significant residual effects upon landscape fabric.

Landscape Character (See LVIA Figures 2 & 7)

11.6 Whilst the site would be located within the landscape character subtype 12b Rolling Fringe and landscape character subtype 5a Ridge and Valley, the direct effects would be limited and not result in overall significant temporary operational or residual post restoration effects.

11.7 However, within the immediate vicinity of the site out to approximately 800m to the north and northeast of the Proposal the direct effects upon landscape character sub-type 5a Ridge and Valley would be substantial in magnitude and of major – major / moderate significance **(Significant)**. Within the landscape character sub-type 12b Rolling Fringe the immediate vicinity effects out to approximately 500m to the south and east would be substantial in magnitude and of major – major / moderate significance **(Significant)**.

11.8 The effects upon the wider landscape character types would be concentrated to discrete elevated parts of the Lake District National Park Landscape Character Assessment (SPD) landscape character type J: High Fell Fringe. Due to the elevated open panoramic views and the minor extent of visibility within the landscape character type the indirect operational and residual effects would not be significant.

Designated Landscapes (See LVIA Figures 1 & 6)

11.9 The Lake District National Park is a landscape of high sensitivity and is located approximately 1.1km to the southeast of the Proposal. Visibility of predominantly the southern parts of the Proposal would be concentrated to a discrete locally elevated location within the northern edge of the Lake District National Park adjacent to the A595. The Proposal would form a small geographical extent and scale of the open panoramic visibility present from the minor elevated extent of the National Park affected. Visibility would be partial views of the Phase 1, 2 and 4 initial soil stripping and extraction, the screen bunds and potentially the upper parts of the processing plant until Phase 3 and the Phase 2 -3 tipping and progressive restoration operations. The operational effects would be of long term duration and of slight magnitude and of moderate significance **(not significant)**. The residual post restoration effects comprising partial views of the upper edge of the western Phase 4 former working faces, a light agricultural land profile change and an increase in native woodland upon Lake District National Park would be of slight - negligible magnitude and of moderate - minor significance **(not significant).**

Residential Receptors (See LVIA Figures 5, 8 & 9)

11.10 Significant temporary effects would be experienced from a limited number of localised residents within approximately 500m - 600m of the Proposal primarily during Phase 1 – 2 operations:

- High Close Farmhouse, immediately adjacent to the north eastern parts of the dormant permission boundary;

- Adams Ghyll, a south facing detached property located approximately 480m to the northeast of the Proposal;

- Muslins cul-de-sac, Plumbland located 500m to the northeast of the Proposal;

- Residents of Croft View (approximately 10 properties), The Green property, and the residents (approximately 7 properties) to the west of the B5301 north of the Inglewood Gardens property (See Photograph 5), Parsonby. Approximately 500m to the north of the Proposal.

11.11 Excluding High Close Farmhouse, the significant effects would be concentrated to the views of Phase 1 – 2 operations involving the north and north east of proposed void screen mound construction, potentially the upper parts of the up to Phase 3 processing area. Beyond Phase 1 – 2 the working void would be largely screen from residents. There would be little or no views of the proposed eastern site tipping area. The significant effects upon High Close Farmhouse would be concentrated to the views south from the rear of the farmhouse to the Phase 1 north of the tipping and processing area screen bund and partial filtered views of the Phase 2 – 3 tipping and progressive restoration within the eastern areas.

11.12 During and after Phase 3 operations where the processing operations would be in the void and the Phase 1 mitigation tree vegetation established, the effects would be predominantly little or no views of the remaining operations so significant effects are not predicted for the remaining operational duration.

11.13 The proposed operations would not significantly affect residential visual amenity within the 3km study area.

11.14 There would be no significant residual post restoration effects upon residential receptors within the 3km study area as a result of the Proposal.

<u>Recreational Receptors (See LVIA Figures 1, 3 & 6)</u>

11.15 There would be no physical effect upon any Public Rights of Way. There would be no overall predicted significant temporary or residual effects upon users of the Public Rights of Way (PRoW) within the 3km study area, although significant operational effects would potentially be experienced over sections of the following footpaths:

- Users of footpaths 248018 and 248019 located immediately north of the Proposal when walking south from the U2279 Parsonby road to the C2001 and from the C2001 road immediately north of the site to High Close Farmhouse;

- Users of footpath 213005 when travelling west from near Bothel to the U2100 road, approximately 1.26km to the east of the Proposal;

- Footpath 213007 within discrete elevated locations in the vicinity of Wharrels Wind Farm, approximately 2.7km to the southeast of the Proposal.

<u>Open Access Land (See LVIA Figures 1 & 6)</u>

11.16 There would be no operational or post restoration views of the site from the Open Access Land located in Bothel.

Road Users (See LVIA Figures 1, 3 & 6)

11.17 There would be no overall predicted significant temporary or residual effects upon users of the transport routes within the 3km study area, although significant operational effects would potentially be experienced over short sections of the following:

- The B5301 which passes to the immediate west of the Proposal (See Photograph 4);
- The C Class road C2001, between Bothel and Gilcrux passes within approximately 315m to the north of the Proposal (Vicinity of Photograph 3); and
- The U2279 located within Parsonby, between the B5301 and C2001 when travelling east over approximately 20m when joining the C2001 (Vicinity of Photograph 3).
- Unclassified minor road U2278, which passes to the immediate east of the site between the A595 and Plumbland Village (See Photograph 2).

Rail users (See LVIA Figures 1 & 6)

11.18 The Cumbrian Coast Railway Line passes approximately 2.4km to the northwest of the Proposal across the study area. Site verification confirmed that there would be little or no views of the site from users of the railway line.

Cumulative Effects (See LVIA Photographs 2, 8, 9, 10 & 11)

11.19 From analysis, excluding a detailed cumulative assessment there would be no significant cumulative effects upon landscape or visual receptors associated with Moota Quarry and the former Clints Quarry (a potential future development). Whilst there would be limited sequential and intervisibility cumulative effects would not be significant. The only receptors with the greatest potential would be users of footpaths 210015 and 213005.

Lighting

11.20 Significant operational lighting effects on localised landscape and visual receptors are not predicted.

Conclusion

11.21 The proposed reopening of the dormant minerals permission at High Close Quarry has been assessed in terms of the potential effects upon landscape and visual amenity, accounting for the duration, scale and geological extent of the impacts. It is evident from this LVIA that the impacts would be limited due to the mitigation incorporated and careful working scheme and progressive restoration strategy design.

11.22 In consideration of the limited operational significant effects upon a small number of receptors during the initial working scheme phases and that there would be no overall predicted operational or residual significant effects the scale and topography of the receiving landscape is considered appropriate to accommodate the Proposal.

APPENDICES

LVIA APPENDIX 1:
LVIA METHODOLOGY

LVIA APPENDIX 1: LVIA METHODOLOGY

1 INTRODUCTION

1.1 ”Landscape and Visual Impact Assessment is a tool used to identify and assess the significance of and the effects of change resulting from development on both the landscape as an environmental resource in its own right and people’s views and visual amenity.” (GLVIA3, paragraph 1.1). Wherever possible, identified effects are quantified, but the nature of landscape and visual assessment requires interpretation by professional judgement. In order to provide a level of consistency to the assessment, the prediction of magnitude and assessment of significance of the residual landscape and visual effects have been based on pre-defined criteria.

1.2 The Guidelines for Landscape and Visual Assessment (Third Edition) (GLVIA3) states that “professional judgement is a very important part of the LVIA” (paragraph 2.23) and that “in all cases there is a need for the judgements that are made to be reasonable and based on clear and transparent methods so that the reasoning applied at different stages can be traced and examined by others.” (paragraph 2.24). It goes on at paragraph 3.32 to state that “there are no hard and fast rules about what effects should be deemed ‘significant’ but LVIAs should always distinguish clearly between what are considered to be the significant and non-significant effects.”

1.3 Landscape and Visual Assessments are separate, though linked procedures. The assessment of the potential effect on the landscape is carried out as an effect on the environmental resource (i.e. the landscape). Visual effects are assessed as an inter-related effect on population.

1.4 Landscape effects derive from changes in the physical landscape elements which may give rise to changes in its distinctive character and how this is experienced, including consideration of aesthetic and perceptual aspects.

1.5 Visual effects relate to changes that arise in the composition of available views as a result of changes to the landscape, to people’s responses to the changes and to the overall effects with respect to visual amenity.

2 ESTABLISHING THE BASELINE

2.1 The **baseline** for consideration of landscape and visual effects is the current situation at the time of the assessment, unless noted otherwise.

2.2 The **future baseline** is considered to be other consented proposals which are not present in the landscape. Where noted, these have been included as part of the cumulative assessment due to the increased degree of uncertainty regarding their status.

2.3 For mineral workings the precise baseline for each assessment will be stated and ideally agreed with the Local Planning Authority.

3 LANDSCAPE EFFECTS

3.1 The starting point for any assessment is a desk based assessment of published landscape assessments. These documents are listed in the Guidance section of this assessment and mapped in figures supporting the assessment.

3.2 The landscape effects of the proposed development are considered against the key characteristics of the receiving landscape. The degree to which the proposed development changes '*the distinct and recognisable pattern that makes one landscape different from another, rather than better or worse*' (Countryside Agency and SNH, 2002), enables a judgement to be made as to the significance of the effect in landscape character terms.

3.3 Direct and indirect landscape effects are defined in GLVIA3. Direct effects may be defined as resulting *"directly from the development itself"* (paragraph 3.22). An indirect (or secondary) effect is one that results *"from consequential change resulting from the development"* (paragraph 3.22) and is often produced away from the site of the proposed development or as a result of a complex pathway or secondary association. The direct or physical landscape effects of the proposed development would generally be limited to within the planning application boundary. The indirect landscape effects are concerned with the visual effects and relate to effects associated with the introduction of the development seen in the context of the existing landscape and visual character of the view.

3.4 In order to reach an understanding of the effects of development upon the landscape resource it is necessary to consider different aspects of the landscape baseline including:

- **Landscape Fabric/Elements**: The individual features of the landscape, such as hills, valleys, woods, hedges, tree cover, vegetation, buildings and roads for example which can usually be described and quantified.

- **Landscape key characteristics**: The particularly notable elements or combinations of elements which make a particular contribution to defining or describing the character of an area, which may include experiential characteristics such as wildness and tranquillity.

- **Landscape value**: The importance attached to a landscape, often used as a basis for designation or recognition which expresses national or regional consensus, because of its special qualities/attributes including aesthetic or perceptual aspects such as scenic beauty, tranquillity or wildness, cultural associations or nature conservation interest. The absence of landscape planning designation should not assume an area of 'low' landscape value. Other factors which influence the value of a landscape include its quality/condition, the presence of any rare elements or rarity of the landscape type itself, whether it is a particularly representative example of landscape type and if there is any evidence that the landscape is valued for recreation where the landscape experience is important or for any specific cultural associations.

3.5 The **sensitivity** (high, medium, low) of the landscape to a particular development considers the susceptibility of the landscape and its value. The overall sensitivity is described as high, medium or low. This is assessed by taking into account the existing landscape value, and susceptibility to change, which often vary depending on the type of development proposed and the particular site location, such that sensitivity needs to be considered on a case by case basis. This should not be confused with 'inherent sensitivity' where areas of the landscape may be referred to as inherently of 'high' or 'low sensitivity. For example a National Park may be described as inherently of high sensitivity on account of its designation, but it may prove to be less sensitive to particular development and/or the design of that development. Alternatively an undesignated landscape may be of high sensitivity to a particular development and/or the design of that development regardless of the lack of local or national designation.

3.6 **Landscape susceptibility** according to GLVIA3 means "the ability of the landscape to accommodate the proposed Development without undue consequences for maintenance of the baseline situation and/or the achievement of landscape planning policies and strategies". Judgements on landscape susceptibility include references to both the physical and aesthetic characteristics and the potential scope for mitigation that would be in character with the landscape. Landscape susceptibility varies according to different areas of landscape character and to different forms of development. As a result the susceptibility to any particular type of development has been adjusted to suit the nature of the development. Even for minerals development the susceptibility of the landscape to different types of minerals development is variable (surface mining, hard rock, sand and gravel extraction etc.) and has been considered separately. Generally speaking lower landscape susceptibility together with lower landscape value tends to indicate lower landscape sensitivity to development. Conversely higher landscape susceptibility and value tends to indicate a higher landscape sensitivity to development.

3.7 The judgements regarding susceptibility and value of the landscape receptor are identified within the sensitivity tables included within Appendix 6-2 to this assessment. These relationships can be complex and value alone does not automatically or by definition have high susceptibility to all types of change. Examples and further guidance on the evaluation of landscape sensitivity are provided below:

High: Landscape character, characteristics and elements which would generally be of higher susceptibility to change to accommodate the proposed type of development and higher landscape value. These are landscapes that may be considered to be of particular importance to conserve and which may be particularly sensitive to change if inappropriately dealt with.

Medium: Landscape character, characteristics and elements where there would be a medium susceptibility and be valued at a regional or community level. These might include landscapes which may be or may not be locally designated.

Low: Landscape Character, characteristics and elements where there would be of lower susceptibility to change to accommodate the proposed type of development. Usually applies to landscapes which are unlikely to be designated by the local authority.

3.8 Where, taking into account the component judgments about the value and susceptibility of the landscape receptor, sensitivity is judged to lie between levels, an intermediate assessment will be adopted.

3.9 **The magnitude of landscape change** arising from the proposed development at any particular location is assessed in terms of its size or scale, geographical extent of the area influenced and its duration and reversibility. With regard to the size or scale of the change, these are largely quantifiable parameters, as follows:

- degree of loss or alteration to key landscape features/elements or characteristics;
- distance from the development;
- landscape backdrop to the development;
- landscape context of other built development, particularly vertical elements.

3.10 Having established the size/scale of change to the landscape baseline, the geographical extent of the change can be identified and a judgement made as to what extent the change would occur in landscape character terms at varying scales.

3.11 Finally the duration and reversibility of the landscape change is considered. Duration can be judged on a time basis appropriate to the nature of the assessment. Reversibility is a judgement about the ability and practicality of the proposed development to be fully reversible (such as wind farms), partially reversible to something similar (such as mineral extraction) or a permanent change in the landscape (such as housing). These can be linked or not according to the nature of the development and how long the change will last. The effects as a result of the proposed development would be considered short term when lasting less than 2 years; medium term when lasting between 2 and 10 years; or long term when lasting between 10 and 25 years.

3.12 Minerals workings are typically regarded as partially reversible where the landscape would be restored to something similar to, but not the same as, the original[1].

3.13 In order to differentiate between different levels of magnitude the following definitions are provided:

Table 1: Magnitude of Change – The Landscape Resource

Substantial	A prominent change that may be large in scale and/or extent and include the loss of key landscape elements/features/characteristics of the baseline or introduction of uncharacteristic elements which would give rise to a fresh characterising effect. The effects could be long term and/or irreversible.
Moderate	A noticeable change of more limited scale and extent including the loss of some key landscape elements/features/characteristics and/or the addition of some new uncharacteristic features or elements that would lead to the potential for change in landscape character in a localised area or part of a landscape character area. The effects could be long to medium term and/or partially reversible.
Slight	A change affecting a small area of landscape character including the loss of lower value landscape elements or the addition of new features or elements of limited characterising influence. The effects could potentially be medium to short term and/or reversible
Negligible	A change affecting smaller areas of landscape character including the loss of some landscape elements or the addition of features or elements which are either of low value or hardly noticeable. The effects could be short term and/or reversible.

[1] GLVIA3 page 91, paragraph 5.52

3.14 The significance of the effect on the landscape resource may be determined by correlating the magnitude of the landscape effect (substantial, moderate, low or negligible) with the sensitivity of the landscape resource (high, medium or low). The following table sets out the main correlations between magnitude and sensitivity

Table 2: Levels of Landscape Effects

Landscape Sensitivity	Magnitude of Change				
		Substantial	**Moderate**	**Slight**	**Negligible**
	High	Major	Major/ Moderate	Moderate	Minor
	Medium	Major/ Moderate	Moderate	Moderate/ Minor	Minor/ negligible
	Low	Moderate	Moderate/ Minor	Minor	Negligible

4 LEVELS OF LANDSCAPE EFFECTS

4.1 The significance of any identified landscape or visual effect has been assessed in terms of major, moderate, minor or negligible. These categories are based on the juxtaposition of landscape sensitivity with the predicted magnitude of change. This matrix should not be used as a prescriptive tool but must allow for the exercise of professional judgement. Thus in some instances a particular parameter may be considered as having a determining effect on the analysis.

4.2 The approach to assessing effects on landscape character is to consider the key characteristics for the Landscape Character Type (LCT) within which the proposed development is located (host) or the adjacent LCT's (non-host) and identify which of these the proposed development would affect. For the host LCTs, where the proposal is located, a significant change in landscape character is likely to occur where valued elements or key characteristics would be lost, superseded or substantially changed. Where particular views are an essential characteristic of a landscape type, significant landscape character effects may occur where the proposed development becomes a defining characteristic of those views. This will depend on the key characteristics of the landscape and nature, extent and duration of the effects that would be brought about by the proposed development.

4.3 Where the landscape effect has been classified as Major or Major/Moderate this is considered to be equivalent to likely significant effects referred to in the EIA Regulations. In some circumstances where 'Moderate' effects are predicted, professional judgement will be applied to ensure that the potential for significant effects arising has been thoroughly considered.

4.4 In this way, the assessment is carried out transparently and systematically. It establishes at what level in the assessor's opinion 'significant effects' arise in terms of the EIA Regulations. It also permits the reader to follow the approach and determine whether or not there is agreement with the judgements made.

5 VISUAL EFFECTS

5.1 In order to identify the significance of a visual effect it is necessary to establish the relative sensitivity of the viewers and the magnitude of the change they experience. In this case sensitivity is a combination of both susceptibility of the viewer to the proposed development and the value of the views obtained.

5.2 Those living within view of the scheme are usually regarded as the highest susceptibility group as well as those engaged in outdoor pursuits for whom landscape experience is the primary objective. The susceptibility of potential visual receptors will also vary depending on the activity of the receptor.

5.3 The value of public views, which is the focus of GLVIA3, will vary depending on the nature, location and context of the view and the recognised importance of the view. Typically, those views of nationally valued landscapes or nationally important viewpoints will likely be of the highest value. Generally, those views of regionally important landscapes or viewpoints would likely be considered of medium value. Whilst those views of landscapes important to local communities, but have no formal planning status would tend to be of lower value, depending on their scenic quality.

5.4 Judgements made with regard to the value of views experienced by private residents is considered separately. Views in a rural context where properties are positioned to take advantage of the views would generally be considered to be of higher value. Views in a semi-rural context or where properties are positioned to take some but not full advantage of views would be considered of medium value. Views in an urban or industrial context or where properties are not positioned to take advantage of views would be considered of lower value.

5.5 Visual receptor sensitivity is defined as high, medium, or low in accordance with the criteria in Table 6.3. Where, taking into account the component judgments about the value and susceptibility of the visual receptor, sensitivity is judged to lie between levels, an intermediate assessment will be adopted.

Table 3: Visual Sensitivity Criteria

High sensitivity	Residents in rural context; users of outdoor recreation focussed on the appreciation of views including footpaths, and national cycleways; people experiencing views from important landscape features of physical, cultural or historic interest, beauty spots and picnic areas of high value landscapes.
Medium sensitivity	Local road users and travellers on trains experiencing views of high or medium value landscapes. People engaged in outdoor recreation with some appreciation of the landscape e.g. road cycling, nature conservation, golf and water based recreation.
Low sensitivity	Workers, users of facilities and commercial buildings (indoors) experiencing views from buildings. Road and rail users on fast moving commuting or trunk routes. Visual receptors where views are incidental and tend to be of lower value.

5.6 The magnitude of change arising from the proposed development at any particular viewpoint is described as substantial, moderate, slight or negligible based on a number of interrelated and largely quantifiable parameters, including:

- distance of the viewpoint from the development;

- extent of the development in the view;
- angle of view in relation to main receptor activity;
- proportion of the field of view occupied by the development;
- height of development relative to the receptor with reference to the scale of other features in the view;
- extent of other built development visible, particularly vertical elements background to the development; and
- duration of view or visual effect.

5.7 It is assumed that the change would be seen in clear visibility and the assessment is carried out on that basis. Where there are operational developments considered as part of the baseline, the visual effects within the main LVA consider the additional effects of the proposed development only. Where there are other consented developments considered as part of the future baseline, the visual effects within the main LVA consider the additional effects of the proposed development only. Where appropriate, comment may be made on lighting and weather conditions. In order to differentiate between different levels of magnitude the following definitions are provided in Table 6.4.

Table 4: Magnitude of Change – Visual Receptors

Substantial	Substantial change, where the proposals would be prominent or very prominent, leading to substantial obstruction of existing view or complete change in character and composition of the baseline though removal of key elements or addition of uncharacteristic elements which may or may not be visually discordant. This change could be long term or of a long duration.
Moderate	Moderate change in the view may involve partial obstruction of existing view or partial change in character and composition of the baseline through the introduction of new elements or removal of existing elements. Change may be readily noticeable but not substantially different in scale and character from the surroundings and wider setting. It may involve partial change in character and composition of the baseline existing view. This change could be medium term or of a medium duration.
Slight	The proposals would be partially visible or visible at sufficient distance to be perceptible and result in limited or minor changes to the view. The character and composition, although altered, will be similar to the baseline existing situation. This change could be short term or of a short duration.
Negligible	Change would be barely distinguishable from the surroundings. The composition and character of the view would be substantially unaltered, approximating to little or no change.

5.8 The threshold for significance of visual effects relies to a great extent on professional judgement. Criteria and local circumstances require close study and careful judgement.

5.9 The following table sets out the main correlations between magnitude and sensitivity.

Table 5: Levels of Visual Effects – Matrix

Visual Receptor Sensitivity		Magnitude of Change			
		Substantial	**Moderate**	**Slight**	**Negligible**
	High	Major	Major/ Moderate	Moderate	Minor
	Medium	Major/ Moderate	Moderate	Moderate/ Minor	Minor/ negligible
	Low	Moderate	Moderate/ Minor	Minor	Negligible

6 LEVELS OF VISUAL EFFECTS

6.1 The significance of any identified visual effect has been assessed in terms of major, moderate, minor or negligible. These categories are based on the juxtaposition of viewpoint or landscape sensitivity with the predicted magnitude of change. This matrix should not be used as a prescriptive tool but must allow for the exercise of professional judgement. Thus in some instances a particular parameter may be considered as having a determining effect on the analysis.

6.2 Where the visual effect has been classified as Major or Major/Moderate this is considered to be equivalent to likely significant effects referred to in the EIA Regulations. In some circumstances where 'Moderate' effects are predicted professional judgement will be applied to ensure that the potential for significant effects arising has been thoroughly considered.

6.3 In this way, the assessment is carried out transparently and systematically. It establishes at what level in the assessor's opinion 'significant effects' arise in terms of the EIA Regulations. It also permits the reader to follow the approach and determine whether or not there is agreement with the judgements made.

6.4 The conclusion that some effects are 'significant' must not be taken to imply that they should warrant refusal in any decision making process which relies on the ES.

7 BENEFICIAL/ADVERSE

7.1 Landscape and visual effects can be beneficial or adverse and in some instances may be considered neutral. Beneficial effects upon landscape receptors may result from changes to the landscape involving positive enhancement measures, or through the addition of well-designed elements, which add to the landscape experience or sense of place in a complementary manner. The landscape impacts are considered against the landscape baseline, taking account of landscape strategies or objectives, where such they exist. Taking a precautionary stance changes to rural landscapes involving construction of man-made objects of a large scale are generally considered to be negative, as they are not usually actively promoted as part of a district wide landscape strategy and therefore the assessment of landscape effects are assumed to be adverse, unless specified otherwise in the text.

8 CUMULATIVE EFFECTS

8.1 In a broad generic sense, cumulative impacts '*result from the incremental changes caused by other past, present or reasonably foreseeable actions together with the project*.'[2] However, an assessment of cumulative effects should focus on whether there are any potential cumulative impacts which are reasonably foreseeable and which are likely to influence the decision making of the proposed development, rather than an assessment of every potential cumulative effect. [3]

8.2 There are many types of cumulative effect such as:

- the effect of an extension to an existing development or the positioning of a new development such that it extends or intensifies the landscape or visual effect;
- The 'filling' of an area with the same or different development;
- Interactions between different types of development, such that the total effect is greater than the sum of the parts;
- Incremental change as a result of successive individual developments such at the combined landscape or visual effect is significant even if the individual effects may not be;
- Temporal effects where simultaneous or successive projects may affect communities or localities over an extended period of time;
- Effects of development which have indirect effects on other developments or land use by enabling it for example a road development enabling new warehouses or by sterilising land;
- The effects resulting from a future action that removes something from the baseline which may have a consequence, such as the felling of woodland would reveal new views.

8.3 Stage One: Scope and Baseline Assessment

8.4 The first stage of the cumulative assessment is to review the existing landscape and visual amenity of the study area. This establishes the baseline or future baseline against which to review the magnitude and significance of cumulative landscape and visual effects relating the proposed development. The baseline information includes landscape planning policy overview, designations, and description of landscape character types and potential visual receptors within the study area.

8.5 Then the scope of any cumulative assessment should be considered including if and what type of cumulative effect might take place. The focus should be on those which are reasonably foreseeable and would influence the decision making of the proposed development.

---

[2] GLVIA3 page 120, paragraph 7.1 quoting Hyder, 1999 ' *Guidelines for the assessment of indirect and cumulative impacts as well as impact interactions*'
[3] GLVIA3 page 121 paragraph 7.5.

8.6 Stage Two: Prediction of Cumulative Effects

8.7 The prediction of landscape and visual effects involves analysis from fixed positions and sequential views from route corridors passing through the study area. The cumulative assessment presents an assessment of the additional effects of the proposed development assuming the baseline or different scenarios or situations as noted above.

9 ILLUSTRATIVE TOOLS

Guidance and Standards Used

9.1 All Visibility Maps (ZTVs), photographs and their graphical presentation have been undertaken in line with the Landscape Institute's Advice Note 01/11,' Photography and Photomontage in Landscape and Visual Impact Assessment' and Technical Guidance Note 02/17, 'Visual Representation of Development Proposals' .

The Computer Models

9.2 A computer model of the proposed site, at specified phases, and study area has been has been produced using McCarthy Taylor Systems Ltd LSS© software. This industry standard software is used to create a 3D computer model of the proposed development and the surrounding landform at specified phases of operations. The landform information is derived from detailed site survey data and 5m/50m resolution terrain data (OS Terrain5 and OS Terrain50 data).

9.3 The computer model combines landform (terrain data) and detailed data collected in the field to enable the output of accurate visual and graphical information and associated data for presentation as finished figures.

Visibility Maps

9.4 A computer generated Zone of Theoretical Visibility (ZTV) Map has been produced using the above LSS© computer models. The ZTV maps assist in representative photosheet selection and indicate the potential influence of the development in the wider landscape. They have been prepared to indicate the extent of potential visibility on the basis of 'bare ground' and do not take into account the screening effects from intervening objects such as built form and tree and other vegetation cover within the landscape.

9.5 The Visibility Maps indicate areas, from which it might be possible to secure views to part or parts of the proposed development. The colour code of the ZTV indicates the extent of visibility of the proposal, based upon the horizontal angle of view (as stated on the LVIA Figure).

9.6 The use of this type of Visibility Map is considered good practice and should be considered as a tool to assist in assessing the visibility of the project. The Visibility Maps do not present an absolute measure of visibility and do not represent the 'visual impact' of the proposed minerals development.

Assessment Photographs

9.7 The assessment of landscape and visual effects are supported by a selection of representative photographs. The photograph locations are selected through professional judgement and verification on site.

9.8 The selected photographs are representative of the views experienced at different distances and directions from the development, as well as from the various landscape character types identified in the study area, from which the proposed quarry development would be visible.

The viewpoints form a photographic reference to assist the landscape and visual assessment. All photographs included in the assessment were taken with a digital SLR camera with full size (35mm) sensor, using a 50mm focal length lens. The viewpoints are presented at approximate 120 degree and 40 degree included angles.

ANNEX 1: GLOSSARY OF TERMS

CLVIA	Cumulative Landscape and Visual Impact Assessment.
Cumulative Effects	Cumulative effects are the additional effects arising from changes caused by a development in conjunction with other past, present or reasonably foreseeable actions.
Direct Effect	A direct (or primary) effect may be defined as an effect that is directly attributable to the development.[4]
GLVIA3	*'Guidelines for Landscape and Visual Impact Assessment, Third Edition'*, published jointly by the Landscape Institute and Institute of Environmental Management and Assessment 2013.
Indirect Effect	An indirect (or secondary) effect is an effect that results indirectly from the proposed project as a consequence of the direct effect, often occurring away from the site, or as a result of a sequence of interrelationships or a complex pathway. They may be separated by distance or in time from the source of the effects. [5]
Key Characteristics	Those combinations of elements which are particularly important to the current character of the landscape and help to give an area its particularly distinctive sense of place.
LVIA	Landscape and Visual Impact Assessment.
Landscape Capacity	The amount of change which a particular landscape character type or area is able to accommodate without significant detrimental effects on its character. Capacity is likely to vary according to the type and nature of change proposed.
Landscape Character	The distinct and recognisable pattern of elements in the landscape that makes one landscape different from another, rather than better or worse. [6]
Landscape Character Areas	These are single unique areas which are the discrete geographical areas of a particular landscape type. [7]

[4] The Landscape Institute/Institute of Environmental Management and Assessment; *Guidelines for Landscape and Visual Impact Assessment*; Spon; 2013; p155

[5] The Landscape Institute/Institute of Environmental Management and Assessment; *Guidelines for Landscape and Visual Impact Assessment*; Spon; 2013; p156

[6] The Landscape Institute/Institute of Environmental Management and Assessment; *Guidelines for Landscape and Visual Impact Assessment*; Spon; 2013; p156

[7] The Landscape Institute/Institute of Environmental Management and Assessment; *Guidelines for Landscape and Visual Impact Assessment*; Spon; 2013; p157

Landscape Character Types	These are distinct types of landscape that are relatively homogeneous in character. They are generic in nature in that they may occur in different areas in different parts of the country, but wherever they occur, they share broadly similar combinations of geology, topography, drainage patterns, vegetation and historical land use and settlement pattern, and perceptual and aesthetic attributes.
Landscape Effects	Effects on the landscape as a resource in its own right. [8]
Landscape Elements	Individual components which make up the landscape such as trees and hedges.
Landscape Features	Particularly prominent or eye-catching elements, like tree clumps, church towers or wooded skylines.
Landscape Quality or Condition	This is a measure of the physical state of the landscape. It may include the extent to which a typical character is represented in individual areas, the intactness of the landscape and the condition of individual elements. [9]
Landscape Receptor	Defined aspects of the landscape resource that have the potential to be affected by a proposal.
Landscape Resource	The combination of elements that contribute to landscape context, character and value.
Landscape Value	The relative value or importance attached to different landscapes by society on account of their landscape qualities. [10]
Level of Effect	Determined through the combination of sensitivity of the receptor and the proposed magnitude of change brought about by the development.
Magnitude (of effect)	A term that combines judgements about the size and scale of the effect, the extent of the area over which it occurs, whether it is reversible or irreversible and whether it is short or long term in duration.
Mitigation	Measures including any process, activity or design to avoid, reduce, remedy or compensate for adverse environmental impact or effects of a development.

8 The Landscape Institute/Institute of Environmental Management and Assessment; *Guidelines for Landscape and Visual Impact Assessment*; Spon; 2013; p157
9 The Landscape Institute/Institute of Environmental Management and Assessment; *Guidelines for Landscape and Visual Impact Assessment*; Spon; 2013; p157
10 The Landscape Institute/ Technical Guidance Note 02/21 Assessing Landscape Value Outside National Designations

Photomontage	A visualisation which superimposes an image of a proposed development upon a photograph or series of photographs.
Residential Visual Amenity	A collective term describing the views and general amenity of a residential property, relating to the garden area and main drive, views to and from the house and the relationship of the outdoor space to the house. Residential Visual Amenity is only one component of the overall Residential Amenity, others being for example noise, shadow flicker and access amongst others.
Residual Effects	Potential environmental effects remaining after mitigation.
Sense of Place	The essential character and spirit of an area: *genius loci* literally means 'spirit of the place'.
Sensitivity	A term applied to specific receptors, combining judgements of the susceptibility of the receptor to the specific type of change or development proposed and the value related to that receptor. [11]
Significant Effects	It is a requirement of the EIA Regulations to determine the likely significant effects of development on the environment which should relate to the level of an effect and the type of effect. Where possible significant effects should be mitigated. The significance of an effect gives an indication as to the degree of importance (based on the magnitude of the effect and sensitivity of the receptor) that should be attached to the impact described. Whether an effect should be considered significant is not absolute and requires the application of professional judgement.
Type or Nature of Effect	Whether an effect is direct, indirect, temporary or permanent, positive (beneficial), neutral or negative (adverse) or cumulative.
Visual amenity	Value of a particular place in terms of what is seen by visual receptors taking account of all available views and the total visual experience.

[11] The Landscape Institute/Institute of Environmental Management and Assessment; *Guidelines for Landscape and Visual Impact Assessment*; Spon; 2013; p157

Visual Effect	Effects on specific views and on the general visual amenity experienced by people. [12]
Visual Receptors	Individuals and/or defined groups of people who have the potential to be affected by a proposal.
Visualisation	Computer simulation, photomontage or other technique to illustrate the appearance of a development. [13]
Wildness	A landscape which may appear to be remote, inaccessible and rugged with little evidence of human influence. [14]
Wireframe or Wireline	A computer generated line drawing of the DTM (Digital Terrain Model) and the proposed development from a known location.
Zone of Theoretical Visibility (ZTV)	Area within which a proposed development may have an influence or an effect on visual amenity. [15]

[12] The Landscape Institute/Institute of Environmental Management and Assessment; *Guidelines for Landscape and Visual Impact Assessment*; Spon; 2013; p158
[13] The Landscape Institute/Institute of Environmental Management and Assessment; *Guidelines for Landscape and Visual Impact Assessment*; Spon; 2013; p158
[14] SNH, *Siting and Designing Wind Farms in the Landscape*; SNH, 2014, p15
[15] The Landscape Institute/Institute of Environmental Management and Assessment; *Guidelines for Landscape and Visual Impact Assessment*; Spon; 2013; p158

LVIA APPENDIX 2:
PHOTOGRAPH LOCATIONS

LVIA APPENDIX 2: PHOTOGRAPH LOCATIONS

Table 1: Photograph Locations

Ref	Location	Distance to the Proposal	Visual Receptors	Landscape Character Type / Area
1	View south from ProW 248019 immediately north of High Close Farm	0m	Users of public Rights of Way	Landscape Character Sub-type 5a: Ridge and Valley
2	View west from Unclassified Road U2278 adjacent to the site boundary	0m	Road users	Landscape Character Sub-type 12b: Rolling Fringe
3	View south from ProW 248019 in the vicinity of the western edge of Plumblands	510m	Users of public Rights of Way and localised residents	Landscape Character Sub-type 5a: Ridge and Valley
4	View north from the B5301 near Wardhall Common	534m	Road users	Landscape Character Sub-type 12b: Rolling Fringe
5	View south from the northern edge of Parsonby	715m	Users of public Rights of Way, road users and localised residents	Landscape Character Sub-type 5a: Ridge and Valley
6	View northeast from PRoW 248020 near Moota Hill	815m	Users of public Rights of Way	Landscape Character Sub-type 12b: Rolling Fringe
7	View west from Unclassified Road U2100	1,087m	Road users and localised residents	Landscape Character Sub-type 12b: Rolling Fringe
8	View southwest from Unclassified Road U2100 a short distance south of Threapland	1,096m	Road users	Landscape Character Sub-type 5a: Ridge and Valley
9	View north from PRoW 210015 adjacent to Moota Quarry	1,120m	Users of public Rights of Way	Landscape Character Sub-type 12b: Rolling Fringe
10	View northwest from Unclassified Road U2100 near the junction with	1,406m	Road users and localised	Landscape Character Sub-

Ref	Location	Distance to the Proposal	Visual Receptors	Landscape Character Type / Area
	the A595		residents	type 12b: Rolling Fringe
11	View west from the A595 near Wharrels Hill Wind Farm	2,165m	Road users	Landscape Character Sub-type 12b: Rolling Fringe
12	View west from C Class Road C2001 a short distance west of Bothel	2,315m	Road users	Landscape Character Sub-type 5a: Ridge and Valley
13	View southwest from Unclassified Road U2083 northeast of Threapland	2,346m	Road users and localised residents	Landscape Character Sub-type 5a: Ridge and Valley
14	View south from Ellen Garth within the south eastern parts of Aspatria	3,317m	Road users and localised residents	Landscape Character Sub-type 5a: Ridge and Valley
15	View southeast from the Unclassified Road U2085 at Oughterside	3,265m	Road users and localised residents	Landscape Character Sub-type 5a: Ridge and Valley
16	View south from central Aspatria	3,435m	Localised residents	Landscape Character Sub-type 5a: Ridge and Valley

LVIA APPENDIX 3:
LANDSCAPE SENSITIVITY ASSESSMENT

APPENDIX 3: LANDSCAPE SENSITIVITY ASSESSMENT

The sensitivity of the landscape character types/areas which may receive significant landscape effects are assessed below. Landscape sensitivity is not absolute and can only be defined in relation to each development and its location. To assess the sensitivity of a particular landscape it is good practice to consider the value attached to the landscape and its susceptibility to the particular form of change likely to result from the proposed development. Assessment text relates to sensitivity of the landscape receptor as a whole to the proposed development, with additional comments regarding the Application Site where relevant. In the main, this has been taken from the Cumbria County Council and Lake District National Park Landscape Character Assessments (quotes shown in italics) as well as from local sources and site assessment.

Table 1: Landscape Character Type 5: Lowland, Sub Type 5a: Ridge and Valley

Host Landscape: **Landscape Character Type 5: Lowland, Sub Type 5a: Ridge and Valley**				
Factors affecting sensitivity	**Lower Sensitivity to Hard Rock Quarry**	**Higher Sensitivity to Hard Rock Quarry**	**Explanation**	**Rating**
Value attached to Landscapes				
Designated scenic quality	No specific designation	National or regional designation	Located in the vicinity of the Lake District National Park	Medium / High
Landscape condition/quality	Landscape in a poor state of repair with incongruous elements	Landscape fully intact in good condition with limited incongruous elements	*'..many parts remain intact and retain the sense of a pleasant, peaceful working farmed landscape.'*	Medium / High
Perception of Change	Dynamic or modern landscapes	Ancient landscapes, designed landscapes or with obvious historical continuity	*'This is a traditional working farmed landscape, interspersed with large scale industrial developments in the countryside.'*	Medium
Rarity and/or Representativeness	Commonplace elements, features, or the landscape itself. Not a good example of the landscape type	Presence of rare elements or features or rarity of the landscape itself. Very representative landscape.	This landscape receptor is a very good example of this landscape sub-type, exhibiting most of the key characteristics	High

Host Landscape: Landscape Character Type 5: Lowland, Sub Type 5a: Ridge and Valley				
Factors affecting sensitivity	**Lower Sensitivity to Hard Rock Quarry**	**Higher Sensitivity to Hard Rock Quarry**	**Explanation**	**Rating**
Conservation Interests	Low presence of wildlife, earth, archaeology or historical interests	High presence of wildlife, earth, archaeology or historical interests	There are notable conservation interests in the area regarding Great crested Newts. Also *'This landscape is important for farmland birds, including yellowhammer, linnet and tree sparrow.'*	Medium / High
Cultural associations	No specific cultural associations	Strong cultural associations which contribute to perceptions of natural beauty.	*'To the west of Carlisle areas of medieval influenced nucleated settlements around former common arable fields and more dispersed farmsteads developed around the time of planned field enclosure.'*	Medium / High
Amenity and recreation	Limited amenity/recreational function where experience of the landscape is important	Well used for recreation where experience of the landscape is important. May contain National Trails or other long distance routes.	There are local Public Rights of Way which *'enable quiet appreciation and enjoyment of the countryside.'*	Medium
			Overall Judgement of Value	**Medium / High**
Susceptibility				
Scale	Landscapes where scale of development is similar to or smaller than scale of receiving landscape	Landscapes where scale of development is larger than scale of receiving landscape	*'These are medium scale landscapes generally enclosed in valleys and around woodlands with a more open feel along the ridge tops.'*	Medium
Landform	Landscapes with similar existing landform features to integrate working but allow for restoration	Landscapes where restoration would be challenging / difficult to integrate	An undulating landscape profile comprising *'a series of ridges and valleys that rises gently toward the limestone fringes of the Lakeland Fells.'* and *'landscape rises gently to high wide ridges with long views or falls to small, narrow valleys.'*	Medium
Openness/ enclosure	Enclosed and sheltered landscapes	Open and exposed landscapes with little enclosure	*'..landscapes generally enclosed in valleys and around woodlands with a more open feel along the ridge tops.'*	Medium

Host Landscape: Landscape Character Type 5: Lowland, Sub Type 5a: Ridge and Valley				
Factors affecting sensitivity	**Lower Sensitivity to Hard Rock Quarry**	**Higher Sensitivity to Hard Rock Quarry**	**Explanation**	**Rating**
Land cover, complexity and patterns	Complex, intimate or mosaic cover or irregular patterns which would disguise working and allow for a variable restoration	Extensive areas of simple or regular landcover or landscapes with sweeping lines or linear features/patterns which would be interrupted by workings and restoration	*'The landscape is dominated by improved farmed pasture'* and *'The patchwork field pattern is interspersed with both native broadleaved and planted coniferous woodlands and some unimproved and features include dense high hedges, woodland, especially along narrow valleys, shelterbelts, remnant parkland and tree clumps. Some hedges are fragmented. Small areas of forestry plantation punctuate the landscape.'*	High
Built Environment	Contemporary masts, pylons, industrial elements, buildings infrastructure, settlements	Established, traditional or historic built character	*'Scattered farm buildings are dispersed throughout the area', 'Villages ….mainly sited along ridge tops.' and 'Industrial activities have influenced the landscape', '..other vertical elements such as pylons, are often sited along ridge tops. They interrupt the skyline and form prominent features in the landscape.'*	Medium/ Low
Key Views and intervisibility	Visually contained and have limited inward or outward views	Extensive views within or of the area from key views	A mix of both visually contained areas and those with panoramic views	Medium
Landscapes that form skylines, backdrops, focal points	Landscapes which may be low lying or more elevated but do not form the skyline or are not backdrops or focal points	Landscapes which form the skyline or are backdrops or focal points that define the setting	From intermittent primarily elevated locations there are open views towards the Lakeland Fells and the Solway Firth	Medium
Wildness/ Sense of Remoteness/ Tranquility	Busy evidence of human activity	Remote, peaceful or sense and tranquility, solitude and emptiness	*'The peaceful pastoral atmosphere away from busier parts is sensitive to large scale development.'*	Medium/ High
			Overall Judgement of Susceptibility	**Medium**
Overall Judgement of Sensitivity				**Medium / High**

Table 2: Landscape Character Type 12: Higher Limestone, Sub Type 12b: Rolling Fringe

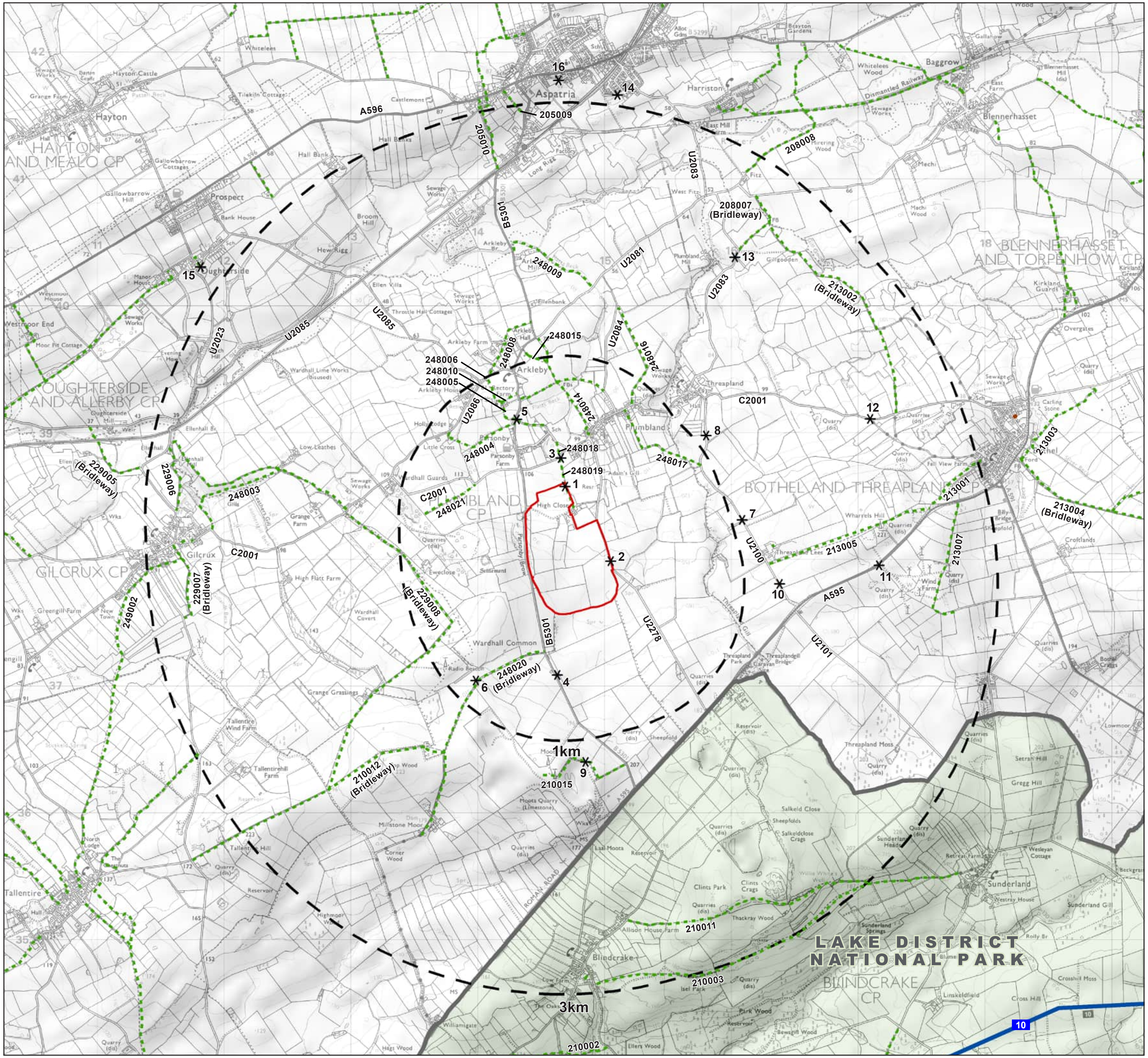
Host Landscape: Landscape Character Type 12: Higher Limestone, Sub Type 12b: Rolling Fringe				
Factors affecting sensitivity	**Lower Sensitivity to Hard Rock Quarry**	**Higher Sensitivity to Hard Rock Quarry**	**Explanation**	**Rating**
Value attached to Landscapes				
Designated scenic quality	No specific designation	National or regional designation	Located on the fringe of the Lake District National Park	High
Landscape condition/quality	Landscape in a poor state of repair with incongruous elements	Landscape fully intact in good condition with limited incongruous elements	The landscape is generally in good condition and fully intact	High
Perception of Change	Dynamic or modern landscapes	Ancient landscapes, designed landscapes or with obvious historical continuity	Change has occurred throughout this landscape but there is a strong historic continuity.	Medium
Rarity and/or Representativeness	Commonplace elements, features, or the landscape itself. Not a good example of the landscape type	Presence of rare elements or features or rarity of the landscape itself. Very representative landscape.	This landscape receptor is a very good example of this landscape type, exhibiting most of the key characteristics,	High
Conservation Interests	Low presence of wildlife, earth, archaeology or historical interests	High presence of wildlife, earth, archaeology or historical interests	*'This is a landscape of improved grassland with only occasional hedgerows.'* and *'The main feature of ecological interest in this landscape is a disused quarry which hosts a large great crested newt population of international importance.'* This quarry is located approx.1.3km to the southeast of the site	Medium / High
Cultural associations	No specific cultural associations	Strong cultural associations which contribute to perceptions of natural beauty.	*'Archaeological remains include Viking Age artefacts in Allerdale and in all areas there is widespread evidence of quarrying, lime kilns and lime burning.'*	Medium / High

Host Landscape: **Landscape Character Type 12: Higher Limestone, Sub Type 12b: Rolling Fringe**				
Factors affecting sensitivity	**Lower Sensitivity to Hard Rock Quarry**	**Higher Sensitivity to Hard Rock Quarry**	**Explanation**	**Rating**
Amenity and recreation	Limited amenity/recreational function where experience of the landscape is important	Well used for recreation where experience of the landscape is important. May contain National Trails or other long distance routes.	*'Public rights of way and open access land provide a network of routes that enable quiet appreciation and enjoyment of the countryside.'*	Medium
			Overall Judgement of Value	**High**
Susceptibility				
Scale	Landscapes where scale of development is similar to or smaller than scale of receiving landscape	Landscapes where scale of development is larger than scale of receiving landscape	A generally large scale landscape.	Medium
Landform	Landscapes with similar existing landform features to integrate working but allow for restoration	Landscapes where restoration would be challenging / difficult to integrate	*'It mainly comprises large scale, rolling or undulating topography at altitudes of 150-300m AOD with some high points reaching around 380m AOD. Small streams and rivers provide variation in topography.'*	Medium
Openness/ enclosure	Enclosed and sheltered landscapes	Open and exposed landscapes with little enclosure	*'This is largely a simple, open landscape, with a more intimate feel in the valleys.'*	Medium
Land cover, complexity and patterns	Complex, intimate or mosaic cover or irregular patterns which would disguise working and allow for a variable restoration	Extensive areas of simple or regular landcover or landscapes with sweeping lines or linear features/patterns which would be interrupted by workings and restoration	*Land cover consists of large, often rectangular, fields of improved pasture divided by stone walls, fences or occasional hedges.', Areas of rough pasture with moorland and moss can be found at higher elevations.'* and *'This is a fairly simple landscape.'*	High
Built Environment	Contemporary masts, pylons, industrial elements, buildings infrastructure, settlements	Established, traditional or historic built character	*'Settlements are generally nucleated with dispersed farms throughout the landscape.'* There are intermittent industrial developments present including wind turbines	Medium

Host Landscape: Landscape Character Type 12: Higher Limestone, Sub Type 12b: Rolling Fringe				
Factors affecting sensitivity	**Lower Sensitivity to Hard Rock Quarry**	**Higher Sensitivity to Hard Rock Quarry**	**Explanation**	**Rating**
Key Views and intervisibility	Visually contained and have limited inward or outward views	Extensive views within or of the area from key views	A mix of both visually contained areas and those with panoramic views	Medium
Landscapes that form skylines, backdrops, focal points	Landscapes which may be low lying or more elevated but do not form the skyline or are not backdrops or focal points	Landscapes which form the skyline or are backdrops or focal points that define the setting	*Views are often expansive across to the Lakeland Fells.'* Views towards the Solway Firth present intermittently.	Medium
Wildness/ Sense of Remoteness/ Tranquility	Busy evidence of human activity	Remote, peaceful or sense and tranquility, solitude and emptiness	*'..the landscape has a pastoral feel with some tranquility and a sense of peacefulness.'*	Medium/ High
			Overall Judgement of Susceptibility	**Medium**
Overall Judgement of Sensitivity				**High / Medium**

FIGURES

LVIA FIGURES



STEPHENSON HALLIDAY
Planning, Landscape & Environment

High Close Quarry, Nr Cockermouth

LVIA FIGURE 1

Landscape Planning Designations and Recreational Receptors

KEY

- Proposed site access application boundary
- 1km and 3km radii from boundary Ref CA49
- LVIA representative photographs
- Administrative Boundary

LANDSCAPE DESIGNATIONS

- Lake District National Park

RECREATIONAL RECEPTORS

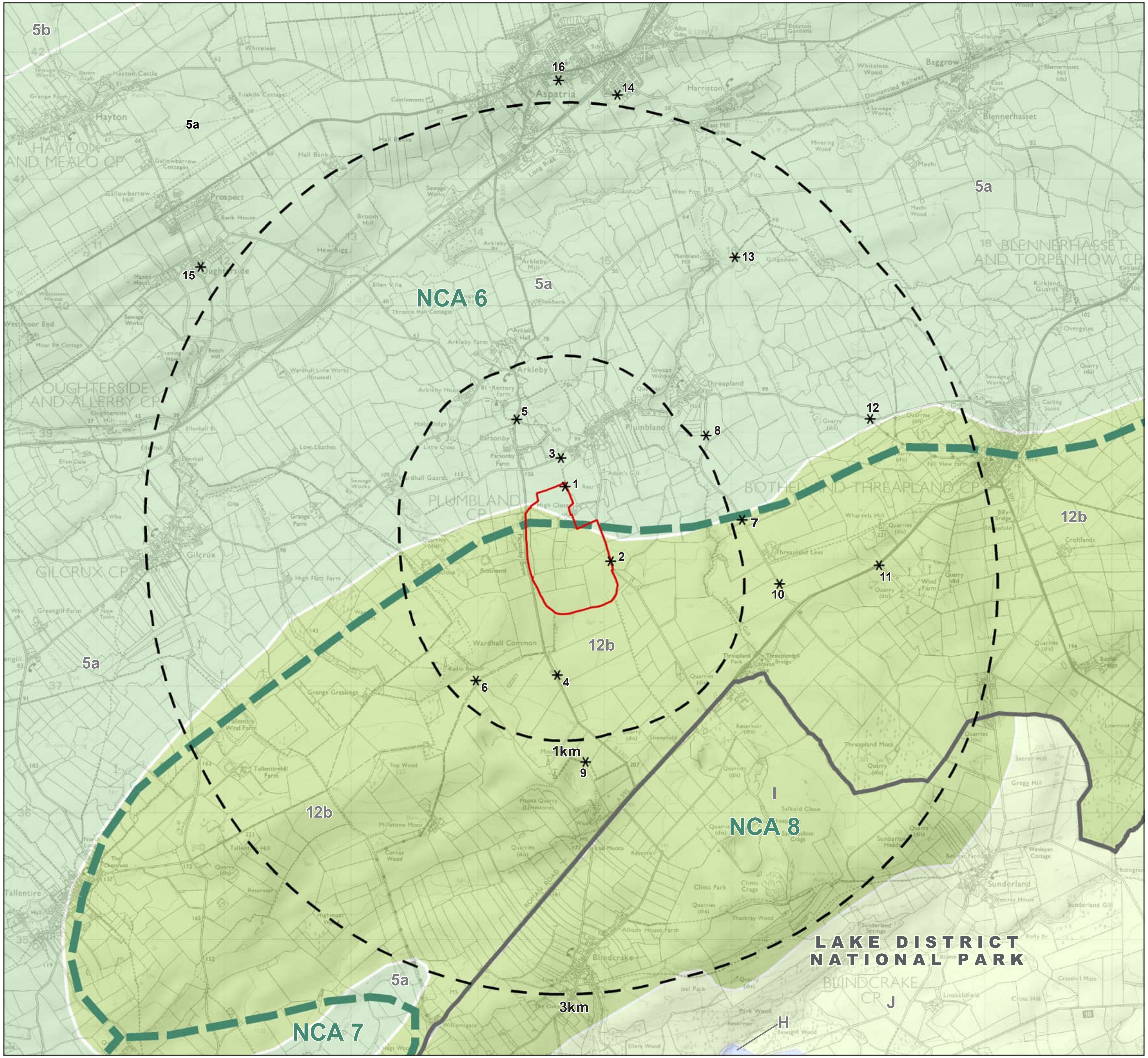
- National Cycle Route 10 (Cockermouth and North Shields via Kielder Forest and Carlisle)
- Public Rights of Way (PRoW)
- Open Access Land (CRoW Act 2000)

0 500 1km

NORTH

DATE	BY	PAPER	SCALE	QA	REV
JAN 2021	JD	A3	1:30,000	DF	-

HCL-015K LVIA Figs REV B.indd



STEPHENSON HALLIDAY
Planning, Landscape & Environment

High Close Quarry, Nr Cockermouth

LVIA FIGURE 2

Landscape Character

KEY

- Proposed site access application boundary
- 1km and 3km radii from boundary Ref CA49
- LVIA representative photographs
- Administrative Boundary

National Landscape Character Areas
NCA 6: Solway Basin
NCA 7: West Cumbria Coastal Plain
NCA 8: Cumbria High Fells

LOCAL LANDSCAPE CHARACTER TYPES

Cumbria County Council Landscape Character Toolkit, 2011

- 5: Lowland
  - 5a: Ridge and Valley
  - 5b: Low Farmland
- 12: Higher Limestone
  - 12b: Rolling Fringe

Lake District National Park Landscape Character Assessment and Guidlines, 2008

- I: Upland Limestone Farmland
- J: High Fell Fringe
- H: Upland Valley

0 500 1km

NORTH

DATE	BY	PAPER	SCALE	QA	REV
JAN 2021	JD	A3	1:30,000	DF	-

HCL-015K LVIA Figs REV B.indd

STEPHENSON HALLIDAY
Planning, Landscape & Environment

High Close Quarry, Nr Cockermouth

LVIA FIGURE 3
Landscape Context

KEY

- Proposed site access application boundary
- 1km radius from boundary Ref CA49
- LVIA representative photographs
- Administrative Boundary

RECREATIONAL RECEPTORS

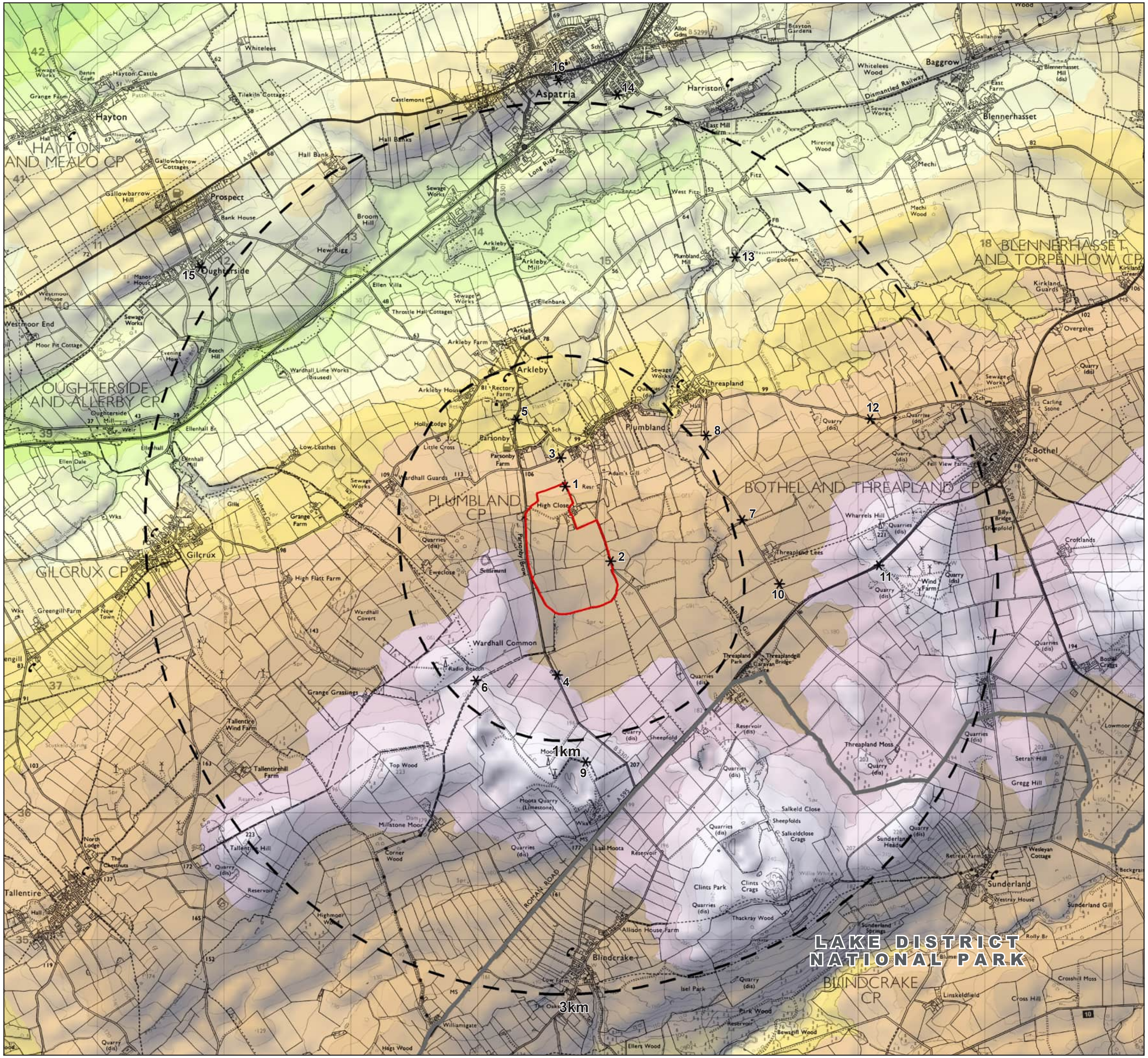
- Public Rights of Way (PRoW)

0 250 500m

NORTH

DATE	BY	PAPER	SCALE	QA	REV
JAN 2021	JD	A3	1:12,500	DF	-

HCL-015K LVIA Figs REV B.indd



Contains Ordnance Survey data © Crown copyright and database right 2020 • Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

STEPHENSON HALLIDAY
Planning, Landscape & Environment

High Close Quarry, Nr Cockermouth

LVIA FIGURE 4

Topography

KEY

- Proposed site access application boundary
- 1km and 3km radii from boundary Ref CA49
- LVIA representative photographs
- Administrative Boundary

TOPOGRAPHY

- 220m AOD
- 200m AOD
- 180m AOD
- 160m AOD
- 140m AOD
- 120m AOD
- 100m AOD
- 90m AOD
- 80m AOD
- 70m AOD
- 60m AOD
- 50m AOD
- 40m AOD
- 30m AOD

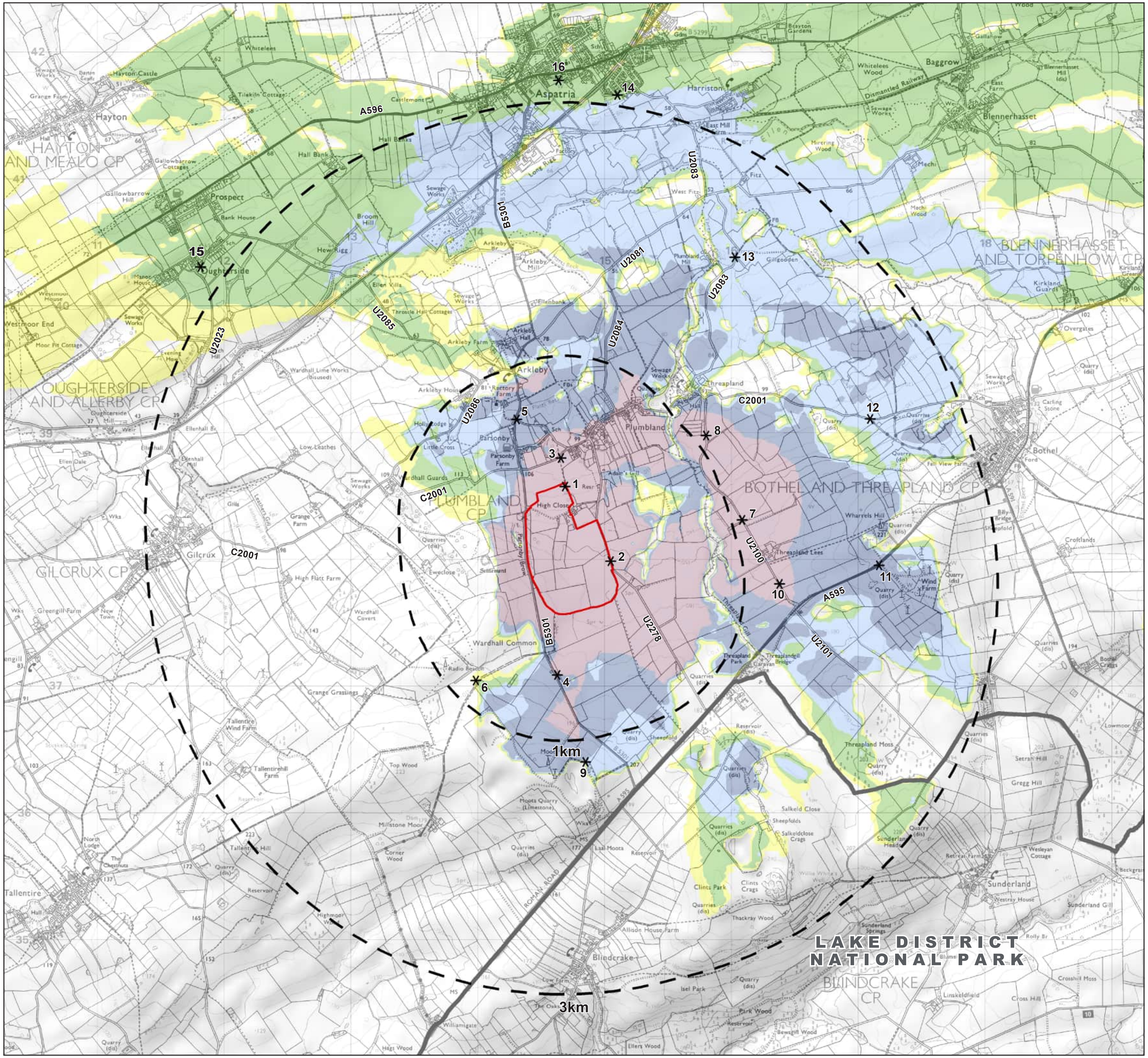
FIGURE DATA:
This figure has been based on OS 50m Terrain Data

0 500 1km

NORTH

DATE	BY	PAPER	SCALE	QA	REV
JAN 2021	JD	A3	1:30,000	DF	-

HCL-015K LVIA Figs REV B.indd



Contains Ordnance Survey data © Crown copyright and database right 2020 • Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

STEPHENSON HALLIDAY
Planning, Landscape & Environment

High Close Quarry, Nr Cockermouth

LVIA FIGURE 5

ZTV of Proposed Operations

KEY

- Proposed site access application boundary
- 1km and 3km radii from boundary Ref CA49
- LVIA representative photographs
- Administrative Boundary

ZONE OF THEORETICAL VISIBILITY

- 0-5 degrees horizontal
- 5-10 degrees horizontal
- 10-15 degrees horizontal
- 15-25 degrees horizontal
- 25+ degrees horizontal

Illustrative Horizontal Angle of View Diagram

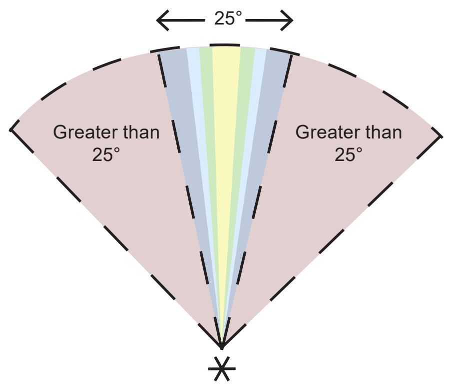


FIGURE DATA:
This figure has been based on the following data:
- Height File: 2017-11-07 Full Extraction ZTV Baseline Survey
- LSS File: 2017-11-07 Full Extraction ZTV
- OS 5m Terrain Data
- OS 50m Terrain Data

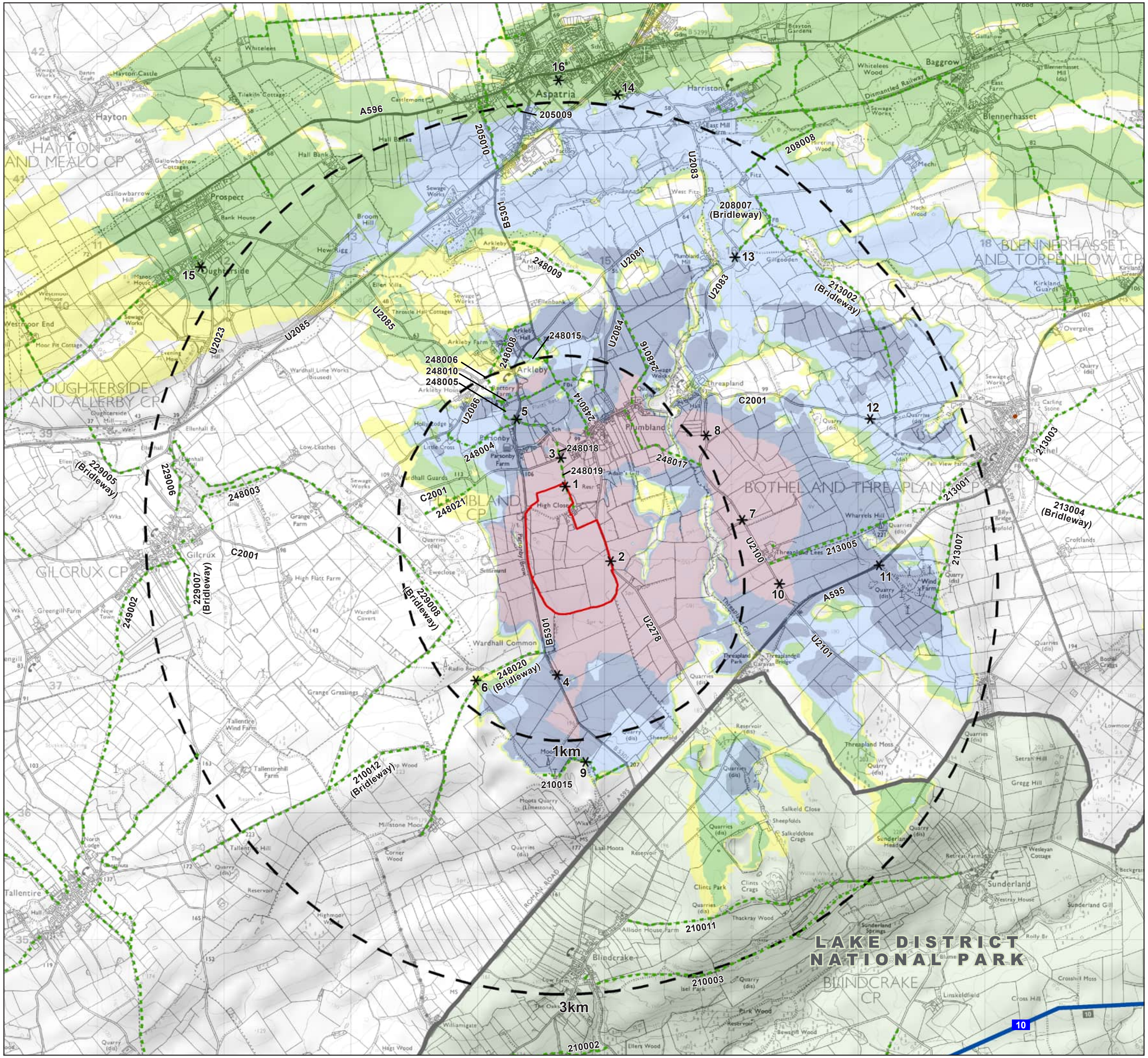
NOTES:
This visibility map is based on a 'bare earth' model of the landform enclosed by the site boundary and does not show any effects of screening from obstacles such as buildings and vegetation.

0 500 1km

NORTH

DATE	BY	PAPER	SCALE	QA	REV
JAN 2021	JD	A3	1:30,000	DF	-

HCL-015K LVIA Figs REV B.indd



Contains Ordnance Survey data © Crown copyright and database right 2020 • Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

STEPHENSON HALLIDAY
Planning, Landscape & Environment

High Close Quarry, Nr Cockermouth

LVIA FIGURE 6

ZTV with Landscape Designations and Recreational Receptors

KEY

- Proposed site access application boundary
- 1km and 3km radii from boundary Ref CA49
- LVIA representative photographs
- Administrative Boundary

LANDSCAPE DESIGNATIONS

- Lake District National Park

RECREATIONAL RECEPTORS

- National Cycle Route 10 (Cockermouth and North Shields via Kielder Forest and Carlisle)
- Public Rights of Way (PRoW)
- Open Access Land (CRoW Act 2000)

ZONE OF THEORETICAL VISIBILITY

- 0-5 degrees horizontal
- 5-10 degrees horizontal
- 10-15 degrees horizontal
- 15-25 degrees horizontal
- 25+ degrees horizontal

FIGURE DATA:
This figure has been based on the following data:

- Height File: 2017-11-07 Full Extraction ZTV Baseline Survey
- LSS File: 2017-11-07 Full Extraction ZTV
- OS 5m Terrain Data
- OS 50m Terrain Data

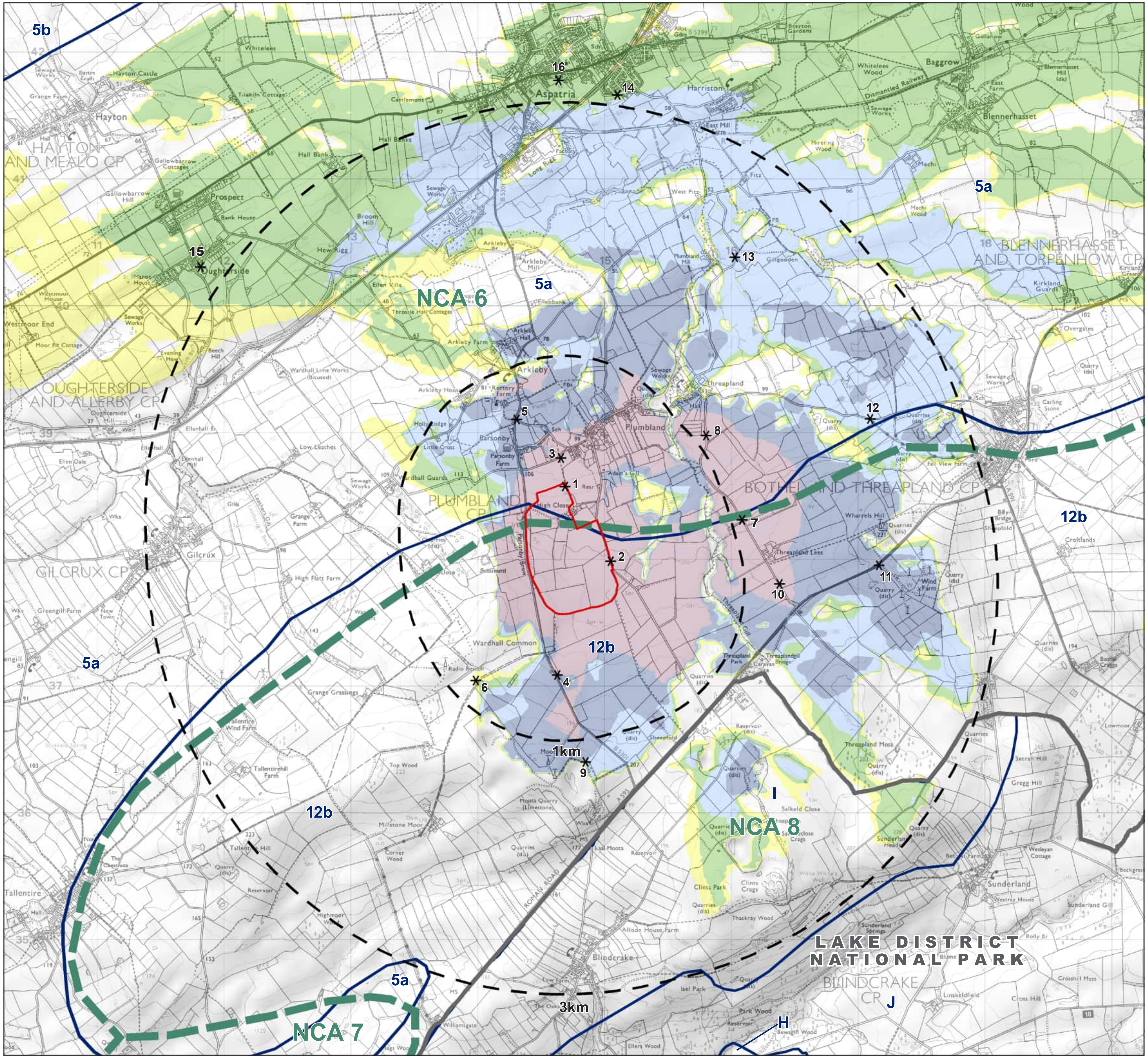
NOTES:
This visibility map is based on a 'bare earth' model of the landform enclosed by the site boundary and does not show any effects of screening from obstacles such as buildings and vegetation.

0 500 1km

NORTH

DATE	BY	PAPER	SCALE	QA	REV
JAN 2021	JD	A3	1:30,000	DF	-

HCL-015K LVIA Figs REV B.indd



STEPHENSON HALLIDAY
Planning, Landscape & Environment

High Close Quarry, Nr Cockermouth

LVIA FIGURE 7
ZTV with Landscape Character

KEY

- Proposed site access application boundary
- 1km and 3km radii from boundary Ref CA49
- LVIA representative photographs
- Administrative Boundary
- National Landscape Character Areas
  - NCA 6: Solway Basin
  - NCA 7: West Cumbria Coastal Plain
  - NCA 8: Cumbria High Fells

LOCAL LANDSCAPE CHARACTER TYPES

Cumbria County Council Landscape Character Toolkit, 2011

- 5: Lowland
  - 5a: Ridge and Valley
  - 5b: Low Farmland
- 12: Higher Limestone
  - 12b: Rolling Fringe

Lake District National Park Landscape Character Assessment and Guidlines, 2008

- I: Upland Limestone Farmland
- J: High Fell Fringe
- H: Upland Valley

ZONE OF THEORETICAL VISIBILITY

- 0-5 degrees horizontal
- 5-10 degrees horizontal
- 10-15 degrees horizontal
- 15-25 degrees horizontal
- 25+ degrees horizontal

NOTES:
This visibility map is based on a 'bare earth' model of the landform enclosed by the site boundary and does not show any effects of screening from obstacles such as buildings and vegetation.

0 500 1km

NORTH

DATE	BY	PAPER	SCALE	QA	REV
JAN 2021	JD	A3	1:30,000	DF	-

HCL-015K LVIA Figs REV B.indd

STEPHENSON HALLIDAY
Planning, Landscape & Environment

High Close Quarry, Nr Cockermouth

LVIA FIGURE 8
Residential Location Plan

KEY
- Proposed site access application boundary
- 1km radius from boundary Ref CA49
- LVIA representative photographs
- Administrative Boundary

RESIDENTIAL RECEPTORS
- Property / settlement Location

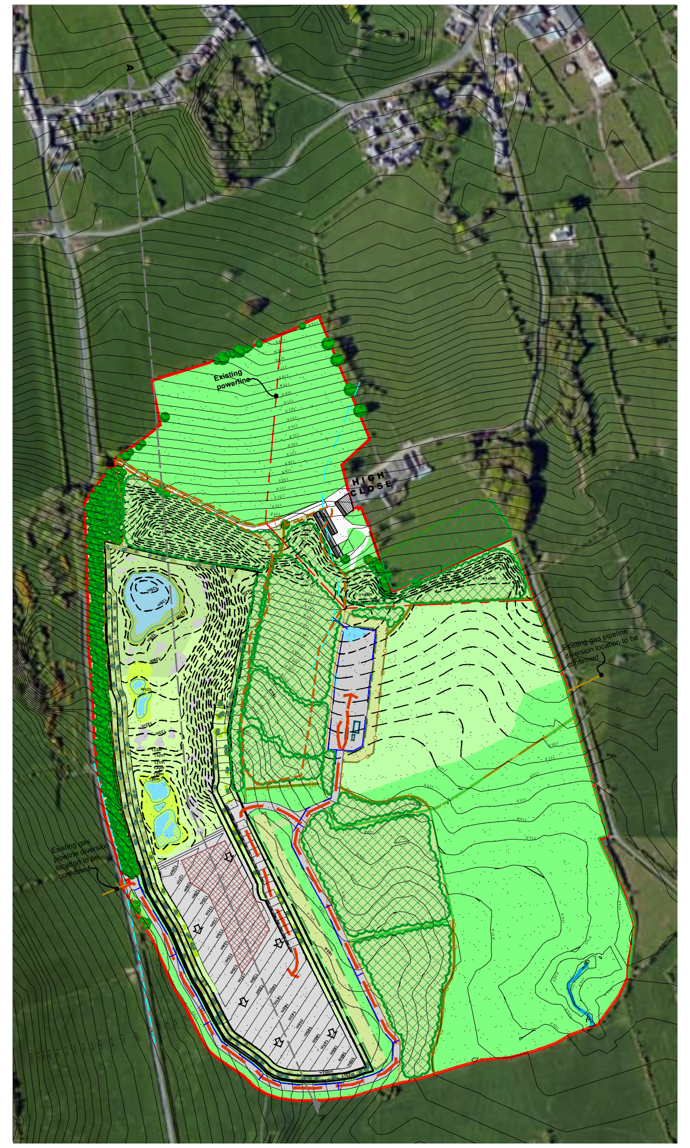
NOTES:
The residential properties and settlements included are only those present within the Zone of Theoretical Visibility (ZTV)

0 250 500m

NORTH

DATE	BY	PAPER	SCALE	QA	REV
JAN 2021	JD	A3	1:12,500	DF	-

HCL-015K LVIA Figs REV B.indd



LVIA SECTION A-A LOCATION
Scale 1:10,000
(Shown on Phase 5 Operations Working Scheme Plan)

LVIA LINE OF SIGHT AND VISUAL SCREENING MITIGATION SECTION A - A

KEY

- Existing landscape profile
- Proposed screen mound
- Proposed void extraction extent
- Proposed mitigation native tree planting
- Line of sight from upper floors
- Line of sight from approx. 1.8m eye level
- 4m height from the existing profile accounting for site excavators and articulated haulers
- Anticipated native woodland heights at relevant operational phases

0 50 100m

STEPHENSON HALLIDAY
Planning, Landscape & Environment

High Close Quarry

LVIA FIGURE 9

Line of Sight and Visual Screening Mitigation Section A - A

Date	By	Paper	Scale	QA	Rev
Jan 2021	DF	840 x 297	1: 2,000	PS	A

2020-09-28 HCL-016Kb Quarry Development Plans updated.dwg

LVIA PHOTOGRAPHS 1 – 16

PHOTOGRAPH 1: View south from PRoW 248019 immediately north of High Close Farm (TYPE 1)

PHOTOGRAPH 2: View west from Unclassified Road U2278 adjacent to the site boundary (TYPE 1)

Date 03/03/2022	By DF
Image Size 820 x 125mm	QA PS
Paper Size 840 x 297mm	Rev A
HCL-018Kc LVIA Vpt Photosheets.indd	

Viewpoint 1 Information:

Grid Reference:	314680E 538593N
Ground Height:	107m AOD
Horizontal Field of View:	120°
Principle Distance:	391.5mm

Photography Information:

Camera:	EOS 5D
Lens:	50mm Fixed Focal Length
Camera Height:	approx. 1.60m
Photography Date:	29/11/2017
Photography Time:	08:19am

Notes:
1) This photography is a cylindrical projection panorama; It provides landscape and visual context only.
2) Location map scale: 1:30,000

Viewpoint 2 Information:

Grid Reference:	315054E 537986N
Ground Height:	158m AOD
Horizontal Field of View:	120°
Principle Distance:	391.5mm

Photography Information:

Camera:	EOS 5D
Lens:	50mm Fixed Focal Length
Camera Height:	approx. 1.65m
Photography Date:	29/11/2017
Photography Time:	10:07am

STEPHENSON HALLIDAY

High Close Quarry, Nr Cockermouth

Landscape & Visual Assessment Photographs 1 & 2

PHOTOGRAPH 3: View south from PRoW 248019 in the vicinity of the western edge of Plumblands (TYPE 1)

PHOTOGRAPH 4: View north from the B5301 near Wardhall Common (TYPE 1)

Date	By
03/03/2022	DF
Image Size 820 x 125mm	QA PS
Paper Size 840 x 297mm	Rev A
HCL-018Kc LVIA Vpt Photosheets.indd	

Viewpoint 3 Information:

Grid Reference:	314650E 538797N
Ground Height:	97m AOD
Horizontal Field of View:	90°
Principle Distance:	522mm

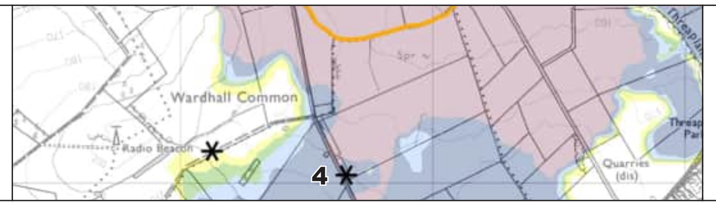
Photography Information:

Camera:	EOS 5D
Lens:	50mm Fixed Focal Length
Camera Height:	approx. 1.60m
Photography Date:	29/11/2017
Photography Time:	08:28am

Notes:
1) This photography is a cylindrical projection panorama; It provides landscape and visual context only.
2) Location map scale: 1:30,000

Viewpoint 4 Information:

Grid Reference:	314624E 537092N
Ground Height:	183m AOD
Horizontal Field of View:	90°
Principle Distance:	522mm



Photography Information:

Camera:	EOS 5D
Lens:	50mm Fixed Focal Length
Camera Height:	approx. 1.73m
Photography Date:	29/11/2017
Photography Time:	11:44am

STEPHENSON HALLIDAY

High Close Quarry, Nr Cockermouth

Landscape & Visual Assessment Photographs 3 & 4

PHOTOGRAPH 5: View south from the northern edge of Parsonby (TYPE 1)

PHOTOGRAPH 6: View northeast from PRoW 248020 near Moota Hill (TYPE 1)

Date 03/03/2022	By DF
Image Size 820 x 125mm	QA PS
Paper Size 840 x 297mm	Rev A
HCL-018Kc LVIA Vpt Photosheets.indd	

Viewpoint 5 Information:

Grid Reference:	314309E 539095N
Ground Height:	96m AOD
Horizontal Field of View:	90°
Principle Distance:	522mm

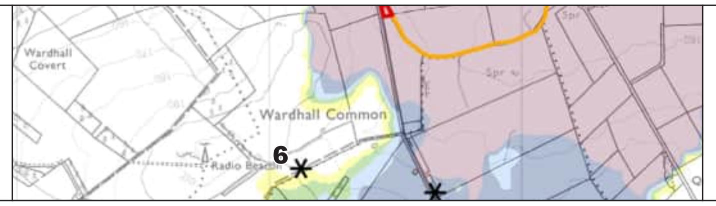
Photography Information:

Camera:	EOS 5D
Lens:	50mm Fixed Focal Length
Camera Height:	approx. 1.54m
Photography Date:	29/11/2017
Photography Time:	8:39am

Notes:
1) This photography is a cylindrical projection panorama; It provides landscape and visual context only.
2) Location map scale: 1:30,000

Viewpoint 6 Information:

Grid Reference:	314004E 537040N
Ground Height:	213m AOD
Horizontal Field of View:	90°
Principle Distance:	522mm



Photography Information:

Camera:	EOS 5D
Lens:	50mm Fixed Focal Length
Camera Height:	approx. 1.70m
Photography Date:	29/11/2017
Photography Time:	12:32pm

STEPHENSON HALLIDAY

High Close Quarry, Nr Cockermouth

Landscape & Visual Assessment Photographs 5 & 6

PHOTOGRAPH 7: View west from Unclassified Road U2100 (TYPE 1)

PHOTOGRAPH 8: View southwest from Unclassified Road U2100 a short distance south of Threapland (TYPE 1)

Date 03/03/2022	By DF
Image Size 820 x 125mm	QA PS
Paper Size 840 x 297mm	Rev A
HCL-018Kc LVIA Vpt Photosheets.indd	

Viewpoint 7 Information:

Grid Reference:	316090E 538308N
Ground Height:	153m AOD
Horizontal Field of View:	90°
Principle Distance:	522mm

Photography Information:

Camera:	EOS 5D
Lens:	50mm Fixed Focal Length
Camera Height:	approx. 1.62m
Photography Date:	29/11/2017
Photography Time:	11:53am

Notes:

1) This photography is a cylindrical projection panorama; It provides landscape and visual context only.
2) Location map scale: 1:30,000

Viewpoint 8 Information:

Grid Reference:	315803E 538982N
Ground Height:	127m AOD
Horizontal Field of View:	90°
Principle Distance:	522mm

Photography Information:

Camera:	EOS 5D
Lens:	50mm Fixed Focal Length
Camera Height:	approx. 1.73m
Photography Date:	1/08/2016
Photography Time:	12:47pm

STEPHENSON HALLIDAY

High Close Quarry, Nr Cockermouth

Landscape & Visual Assessment Photographs 7 & 8

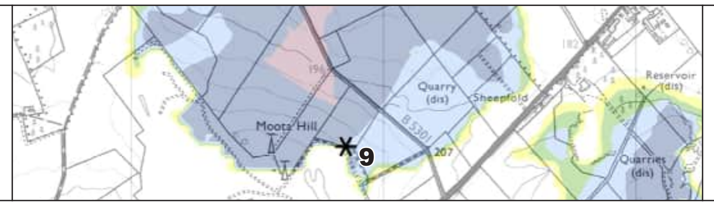
PHOTOGRAPH 9: View north from PRoW 210015 adjacent to Moota Quarry (TYPE 1)

PHOTOGRAPH 10: View northwest from Unclassified Road U2100 near the junction with the A595 (TYPE 1)

Date 03/03/2022	By DF
Image Size 820 x 125mm	QA PS
Paper Size 840 x 297mm	Rev A
HCL-018Kc LVIA Vpt Photosheets.indd	

Viewpoint 9 Information:

Grid Reference:	314833E 536477N
Ground Height:	225m AOD
Horizontal Field of View:	90°
Principle Distance:	522mm



Photography Information:

Camera:	EOS 5D
Lens:	50mm Fixed Focal Length
Camera Height:	approx. 1.63m
Photography Date:	29/11/2017
Photography Time:	12:09pm

Notes:
1) This photography is a cylindrical projection panorama; It provides landscape and visual context only.
2) Location map scale: 1:30,000

Viewpoint 10 Information:

Grid Reference:	316379E 537805N
Ground Height:	174m AOD
Horizontal Field of View:	90°
Principle Distance:	522mm

Photography Information:

Camera:	EOS 5D
Lens:	50mm Fixed Focal Length
Camera Height:	approx. 1.63m
Photography Date:	29/11/2017
Photography Time:	10:45am

STEPHENSON HALLIDAY

High Close Quarry, Nr Cockermouth

Landscape & Visual Assessment Photographs 9 & 10

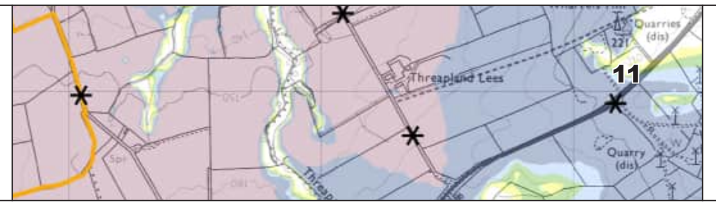
PHOTOGRAPH 11: View west from the A595 near Wharrels Hill Wind Farm (TYPE 1)

PHOTOGRAPH 12: View west from C Class Road C2001 a short distance west of Bothel (TYPE 1)

Date 03/03/2022	By DF
Image Size 820 x 125mm	QA PS
Paper Size 840 x 297mm	Rev A
HCL-018Kc LVIA Vpt Photosheets.indd	

Viewpoint 11 Information:

Grid Reference:	317169E 537953N
Ground Height:	212m AOD
Horizontal Field of View:	90°
Principle Distance:	522mm



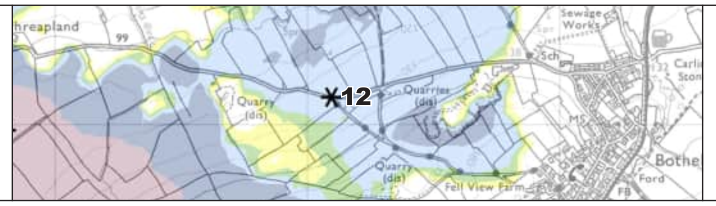
Photography Information:

Camera:	EOS 5D
Lens:	50mm Fixed Focal Length
Camera Height:	approx. 1.65m
Photography Date:	29/11/2017
Photography Time:	10:30am

Notes:
1) This photography is a cylindrical projection panorama; It provides landscape and visual context only.
2) Location map scale: 1:30,000

Viewpoint 12 Information:

Grid Reference:	317134E 539091N
Ground Height:	146m AOD
Horizontal Field of View:	90°
Principle Distance:	522mm



Photography Information:

Camera:	EOS 5D
Lens:	50mm Fixed Focal Length
Camera Height:	approx. 1.68m
Photography Date:	29/11/2017
Photography Time:	11:57am

STEPHENSON HALLIDAY

High Close Quarry, Nr Cockermouth

Landscape & Visual Assessment Photographs 11 & 12

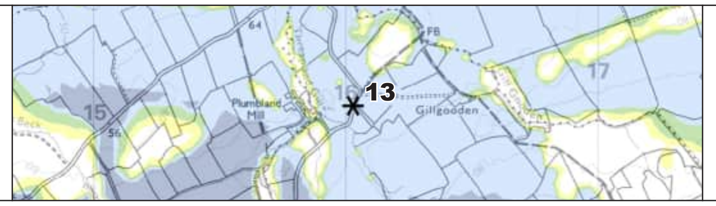
PHOTOGRAPH 13: View southwest from Unclassified Road U2083 northeast of Threapland (TYPE 1)

PHOTOGRAPH 14: View south from Ellen Garth within the south eastern parts of Aspatria (TYPE 1)

Date 03/03/2022	By DF
Image Size 820 x 125mm	QA PS
Paper Size 840 x 297mm	Rev A
HCL-018Kc LVIA Vpt Photosheets.indd	

Viewpoint 13 Information:

Grid Reference:	316035E 540384N
Ground Height:	68m AOD
Horizontal Field of View:	90°
Principle Distance:	522mm



Photography Information:

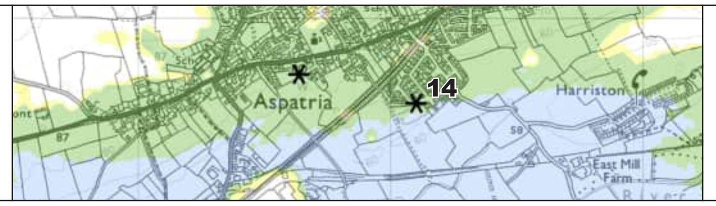
Camera:	EOS 5D
Lens:	50mm Fixed Focal Length
Camera Height:	approx. 1.63m
Photography Date:	29/11/2017
Photography Time:	08:59am

Notes:

1) This photography is a cylindrical projection panorama; It provides landscape and visual context only.
2) Location map scale: 1:30,000

Viewpoint 14 Information:

Grid Reference:	315083E 541663N
Ground Height:	59m AOD
Horizontal Field of View:	90°
Principle Distance:	522mm



Photography Information:

Camera:	EOS 5D
Lens:	50mm Fixed Focal Length
Camera Height:	approx. 1.60m
Photography Date:	29/11/2017
Photography Time:	09:11am

STEPHENSON HALLIDAY

High Close Quarry, Nr Cockermouth

Landscape & Visual Assessment Photographs 13 & 14

PHOTOGRAPH 15: View southeast from the Unclassified Road U2085 at Oughterside (TYPE 1)

PHOTOGRAPH 16: View south from the central Aspatria (TYPE 1)

Date 03/03/2022	By DF
Image Size 820 x 125mm	QA PS
Paper Size 840 x 297mm	Rev A
HCL-018Kc LVIA Vpt Photosheets.indd	

Viewpoint 15 Information:

Grid Reference:	311809E 540290N
Ground Height:	71m AOD
Horizontal Field of View:	90°
Principle Distance:	522mm

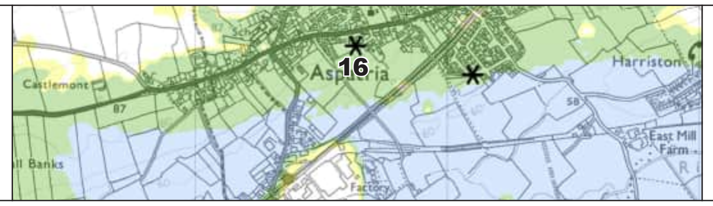
Photography Information:

Camera:	EOS 5D
Lens:	50mm Fixed Focal Length
Camera Height:	approx. 1.65m
Photography Date:	29/11/2017
Photography Time:	13:06pm

Notes:
1) This photography is a cylindrical projection panorama; It provides landscape and visual context only.
2) Location map scale: 1:30,000

Viewpoint 16 Information:

Grid Reference:	314636E 541801N
Ground Height:	76m AOD
Horizontal Field of View:	90°
Principle Distance:	522mm



Photography Information:

Camera:	EOS 5D
Lens:	50mm Fixed Focal Length
Camera Height:	approx. 1.67m
Photography Date:	29/11/2017
Photography Time:	09:30am

STEPHENSON HALLIDAY

High Close Quarry, Nr Cockermouth

Landscape & Visual Assessment Photographs 15 & 16

APPENDIX 3: ECOLOGY

High Close Quarry, Parsonby: Proposed limestone quarry

Ecological Addendum

Rigby Jerram Ecological Consultants
4 Bankfield
Kendal
Cumbria
LA9 5DR
Tel & Fax: 01539 726618
e-mail: rigby@jerramecology.co.uk

A report by
Rigby Jerram
For Thomas Armstrong (Holdings) Ltd
14th October 2021

Contents

Rigby Jerram ecological consultants

1. Introduction

This addendum to the Ecology chapter in the Environmental Statement submitted as part of the Review of Mineral Planning application 02/2019/9010 following a request for further information by Cumbria County Council.

The Addendum is intended to address the requests for further information on:

- protected species, specifically bat roosts and red squirrels;
- lighting impacts on bats;
- impacts on the ecological assessment of a review of the hydrogeological assessment in relation to the zone of influence of the scheme and potential impacts on nearby surface waters and springs;
- impacts on priority habitats;
- a revision of the restoration scheme;
- biodiversity net gains and losses;
- cumulative and in-combination impacts;
- A proposed Landscape and Ecological Management plan is also discussed.

2. Zone of Influence

In light of earlier hydrogeological assessment of the proposed quarry and adjacent landfill by TerraConsult (April 2020) and in subsequent assessment (April 2021) (see Appendix 11 Section 6 of the Resubmission ES) the Zone of Influence has been extended to encompass Flatts Beck. The beck arises from springs originating at the base of the limestone beds which are proposed to be quarried at High Close. Flatts Beck is a tributary of the River Ellen and rises at Flatt Beck Spring some 740m northwest of the proposed quarry void. Farm Spring to the north northeast of High Close also flows into Flatts Beck and is 510m from the proposed quarry void. This redefinition of the Zone of Influence is important as it takes into account the potential for changes brought about by quarrying on the local hydrogeology and potential hydrological impacts on Flatts Beck. It also takes into account potential impacts of quarrying on the seepage of leachate from the adjacent landfill into the groundwater and potential pollution impacts of this on Flatts Beck.

In terms of any potential leachate pollution impacts on Flatts Beck, the TerraConsult (April 2021) assessment concluded that it was unlikely that there is a residual reservoir of potentially toxic substances which could adversely affect the ecology in the tributary springs and streams reaching Flatts Beck. Consequently, it was considered that Flatts Beck is outside of the sphere of influence of the landfill, which has been endorsed by the recent monitoring and chemical analysis of Flatts Beck. This monitoring and chemical analysis has demonstrated the absence of any leachate pollution.

3. Protected Species

3.1. Red Squirrels

A survey to determine the presence or absence of red squirrels in the woodland was carried out in late winter and spring 2020. Three walkover surveys were carried out in February, March and May to inspect trees for squirrel dreys. In addition to looking for dreys observations were made to record any evidence of squirrel activity such as feeding remains, droppings or actual squirrels.

In addition to these surveys two baited camera traps were set up in the wood. These comprised a feeder loaded with a squirrel feed mix and a motion activated camera able to record video and still images 24 hours a day in both daylight and at night. These camera traps were left in place for 67 days between 24th February and 1st May. The cameras recorded throughout this period.

During the walkover surveys no squirrel dreys were found and no squirrels or squirrel evidence was found. The cameras recorded no squirrels, either red or grey, during the period of monitoring.

The surveyors noted that the woodland is relatively small and has poor connectivity with other areas of woodland and that the landscape around High Close, whilst it has small patches of woodland, does not have any significant coverage of woodland and so would not be able to sustain a significant population of squirrels.

It was concluded that the site does not support a population of either red or grey squirrels.

3.2. Bats

Roosts

An initial survey of tree roost potential in the woodland in 2018 found two trees to have high potential and two to have moderate potential. This survey was repeated in 2020 and it was found that four trees had high potential, one had moderate to high potential and a further four had moderate bat roost potential. Whilst no definitive evidence of roosting bats was found there were signs that there maybe bat usage of the high potential trees, though not of the moderate potential ones.

Three of these trees (all of moderate potential) lie within the proposed excavation area and three (all with high potential) are close to the edge of this area. All three trees within the excavation area are would be felled in Phase 2 of the Development Plan, whilst one of the trees near the edge would be impacted by Phase one and the other two by Phase 2. As extraction will start on the eastern side of the void and progress westwards the felling of the three trees within the proposed void would occur some five years after extraction commenced at the earliest.

The differences in roost potential found between the two surveys show that bat roost potential in trees changes over time and can occur from one roosting season to the next. Not only do trees mature and develop more potential roost features, but roost potential may also decline as roosts can be lost to wind damage. Flight Ecology who conducted the 2020 survey concluded that a full inspection survey of the trees would not be practical at this time as by the time the trees came to be felled in eight years time the survey results would be very out of date. From an ecological perspective it would be more advantageous to conduct full tree inspections closer to the felling date when the results will be more accurate and relevant.

To ensure that no harm comes to either bats directly or their roosts the following protocol will be followed:

- No trees to be felled until a more detailed survey is undertaken;
- A detailed Potential Roost Feature survey is to be carried out prior to the felling of any trees;
- Appropriate surveys will be undertaken to establish whether bats are present in within any potential roost features. This is likely to require aerial inspection of features;
- Surveys will commence a minimum of one year prior to the planned felling to ensure that a minimum of four seasons of survey data can be obtained prior to felling;
- Should any bat roosts be identified during the subsequent surveying then an appropriate derogation license will need to be applied for from Natural England;
- Measures will be put in place to minimise disturbance to roosts in trees which are not to be felled but which maybe indirectly affected by felling;
- Any roosts in trees that are to be felled should be removed in their entirety and re-erected in a nearby tree, in as similar situation as possible to its original position;
- Buffer of at least one tree around a known roost tree must be left un-felled, so as to provide a cushion against the disturbance impacts of the felling process and quarry activities;
- A minimum of twelve bat boxes will be erected in the remaining woodland. These will comprise or be similar to Greenwoods EcoHabitats crevice and cavity boxes.

In addition to these measures the scheme includes a substantial amount of advanced woodland planting around the margins of the quarry which will be starting to provide bat foraging habitat and improved habitat connectivity for bats by midway through the development plan timeline.

Lighting

Summer working hours will be 7am to 6pm Monday to Friday and 7am to 1pm on Saturdays. In the winter months (approx. November to February) this will be reduced between 8am and 5pm Monday to Friday. This will mean that there will be a need for lighting for approximately 1 – 1.5 hours a day during the winter at the beginning and end of the day.

The lighting requirements would potentially be present at the following locations:

- Site offices and weighbridge area;
- Direction lighting on mobile site plant and articulated haulers; and
- Lighting around the access and the Phase 1 to mid Phase 3 stockpiling and processing area.

This requirement for lighting coincides with the bat hibernation period so there will be only a limited impact on foraging bats. Bats are not however entirely inactive over winter and will emerge to feed on warmer nights so there will be occasions when there is potential for site lighting to interfere with bat foraging.

The bat activity survey found that at dawn and dusk bat activity was concentrated within and along the edge of the western woodland, only moving out into the more exposed fields in the centre of the site later in the evening. This suggests that the majority of bat activity at the time when there will be lighting on site will be in the woodland and along its edges, with little if any activity in the vicinity of the offices and Phase 1 to mid-Phase 3 stockpiling and processing area. The majority of the bats recorded during the activity surveys (80 – 90% depending on recording method) were pipistrelles (both common and soprano), species which are not affected by lighting. Of the remaining bat species recorded at High Close noctule are not affected by lighting but *Myotis* species bats and brown long-eared bats avoid illuminated areas.

For the majority of the bats present around High Close there will be a neutral impact from lighting, however for the minority of bats present there is potential for a minor adverse impact at the local (sub-parish) scale.

To minimise lighting impacts the number, type and intensity of lights will be restricted such that the external lighting will be low level and small scale. Lights will be fitted with cowls to ensure that light is directed solely on the working area and does not spill out into the wider landscape. In addition lights will be specified to have a warm white spectrum (<2,700 kelvin) and have a peak wavelength higher than 550nm. This will reduce the amount of ultraviolet light emitted significantly reducing the impact of lighting on *Myotis* and brown long-eared bats[1]. The Applicant has proposed to the Mineral Planning Authority that such details are secured by planning condition.

With the proposed mitigation measures and the very limited circumstances in which bats will be emerging when lighting is in use adverse impacts on *Myotis* and brown long-eared bats will be reduced to negligible levels.

4. Priority Habitats

The woodland on the western edge of the site falls into the definition of the Lowland Mixed Deciduous Woodland Priority Habitat, whilst the hedgerows fall into the Hedgerows Priority Habitat.

This does not impact upon the assessments of ecological importance given in the Environmental Statement or the magnitude of impact assessments in that document. The woodland remains of local (parish) importance, whilst the more botanically and structurally diverse hedgerows are still of local (parish) importance whilst the less diverse ones are of local (sub-parish) importance.

5. Hydrogeology

Concern has been raised by various consultees of the Review of Mineral Planning application for High Close Quarry as to the potential for quarrying adjacent to a former Cumbria County Council

[1] Institution of Lighting Professionals and Bat Conservation Trust. 2018. Guidance Note 08/18. Bats and Artificial Lighting in the UK. https://theilp.org.uk/publication/guidance-note-8-bats-and-artificial-lighting/ [accessed 28th September 2020]

landfill site which closed in 1990. The Environment Agency had initial concerns that *the quarrying proposal presents a risk that could exacerbate mobilisation and pollution potential of unknown Hazardous Substances into the underlying aquifer.* The underlying aquifer feeds the springs which give rise to Flatts Beck which flows eastwards between the villages of Parsonby/Plumbland and Arkleby some 750m to the north of High Close. Should there be significant concentrations of hazardous substances in this groundwater originating from the landfill then there would be potential for there to be adverse impacts on the ecology of Flatts Beck and, less likely, the River Ellen 2km down stream.

Chapter 14 and appendices 10 and 11 of the wider response to Cumbria County Council's Regulation 22 request contains additional recent appraisal of the implications of the proposals in relation to hydrogeology. This expands upon the detailed environmental assessment of the relationship between the proposed quarry and the landfill and potential impacts of blasting already provided in the earlier reports by TerraConsult Ltd[2], Kevan Walton Associates Ltd[3] and Stephenson Halliday's (Technical note[4]). The conclusion of these reports are summarised below:

- The High Close Quarry landfill has been subject to over 30 years of rainwater leachate dilution and organic breakdown of the landfill content.
- As a result of dilution and decomposition the leachate contains low to negligible hazardous and non-hazardous substances, however those substances present are readily degradable and within concentration ranges where passive treatment techniques such as reedbeds can be used to prevent pollution of controlled waters.
- The assessment of the potential effect of vibration from blasting concluded that vibration damage to the limestone buffer zone is unlikely and can be limited by good blasting practice.
- The groundwater system and the associated spring lines that the groundwater system will discharge to will be unaffected by the proposed quarry. However, there is the potential for leachate influenced seepages to occur on the eastern flank of the quarry adjacent to the western side of the landfill by the proposed quarrying scheme.

To ensure that there is no increase in leachate levels in the groundwater system as a result of quarrying the proposal has been modified as follows:

- The base of the quarry in the area adjacent to the landfill has been raised to above the existing seasonal high groundwater level.
- The stand-off between the quarry and the landfill will be a minimum of 25m at ground level and 75m at the base of the quarry.

[2] TerraConsult Ltd. 2020. High Close Quarry Development: Landfill Quarry Hydrogeological Relationship. Report No. 2934-R01. April 2020.

[3] Kevan Walton Associates Ltd. 2020. High Close Quarry: Slope Stability and Blasting Adjacent to the Former Landfill. April 2020.

[4] Stephenson Halliday Limited & TerraConsult Limited. 2020. High Close Quarry, Plumbland: Technical Note: Hydrogeological Considerations. September 2020.

- A programme of sampling and analysis of groundwater for hazardous substances will be included, specified by a planning condition, such that there will be regular monitoring and reporting of groundwater quality which will allow the early detection of any change in environmental conditions and prompt action to remedy the situation.
- A conceptual scheme for the interception of any leachate seepages into the quarry is proposed with reedbeds in interception channels on quarry benches and/or the quarry floor adjacent to the eastern quarry wall feeding into a larger wetland at the base of the quarry which will discharge to groundwater. The system would involve monitoring water quality at the base of the quarry and incorporate a facility whereby, in the unlikely event of more concentrated landfill effluent which is beyond the on-site treatment capacity being detected, it can be contained and tankered off-site for treatment.

On-going monitoring being carried (commenced in January 2020) confirms that currently there are no elevated levels of hazardous substances at Flatts Beck Spring or Farm Spring. The updated assessment (Appendix 11 of the Regulation 22 response, dated April 2021) carried out by TerraConsult concludes that it is unlikely that quarrying will result in an increase in levels of these chemicals.

Notwithstanding earlier findings, in February 2021 the Applicant installed two further groundwater monitoring boreholes on the former landfill site at the request of the Environment Agency. It is anticipated that this additional groundwater sampling information will continue to corroborate the conclusions of earlier analysis. The additional information will inform the ongoing ground and surface water monitoring and management regime.

All evidence collected by the Applicant to date confirms that it is unlikely quarrying will result in an increase in levels of landfill substances emanating from the site. The adjustments to the scheme and incorporation of a programme of groundwater monitoring and a system for intercepting and treating any leachate which seeps into the quarry will ensure that this remains the case. Taking these factors into account it can be concluded that the proposed quarry will have a neutral impact on the ecology of Flatts Beck and the River Ellen.

6. Revised Restoration Plan

The Restoration Plan has been significantly revised to include a large increase in the extent of new native woodland to be planted, including an increase in the extent of woodland planted in Phase 1 at the outset of quarrying. Table 1 provides a summary of the extent of the proposed habitat creation and a comparison with the restoration plan submitted in 2019. Overall it can be seen that there is a threefold increase in the extent of woodland to be planted which provides a very significant increase in the level of compensation for the loss of 1.12ha of existing woodland. The original restoration plan proposed a four for one (4:1) level of replacement for woodland loss. The revised plan has a 15 for one replacement ratio (15:1), meaning that for each hectare of woodland felled 15 hectares will be planted.

It can be seen that there is a slight reduction in the extent of calcareous grassland to be created. This is because the revised plan will see the access route around the southern edge of the void restored to woodland rather than calcareous grassland. The reason for this is to provide better foraging habitat continuity for bats around the southern part of the scheme, linking the new woodland to the east of the void with the existing woodland along the road.

The south eastern part of the site has been left undisturbed to retain curlew breeding habitat.

Table 1 Habitat Gains and Losses After Restoration

Area	Agricultural Grassland (Hectares)	Native Woodland (Hectares)	Field Boundary Hedgerows (m)	Calcareous Grassland, Scrub and Bare Limestone (Hectares)	Ephemeral Water Bodies with Aquatic Vegetation (Hectares)	High Close Farm Extent (Hectares)
Existing habitat within and located on the dormant permission boundary	46.8	2.6	2,010	0	0	0.73
Land outside the dormant permission boundary	0.93	0.93	N/A	N/A	N/A	N/A
Habitat to be retained undisturbed	15.4	1.48	1,541	N/A	N/A	0.73
Habitat loss due to the Proposal	27.36	1.12	478	N/A	N/A	0
Proposed Final Restoration including proposed woodland outside dormant permission area (excluding undisturbed areas)	4.97 (8.54)*	17.5 (4.97)	1,500 (1,286)	11.18 (13.29)	1.28 (1.3)	N/A
Total Change (Compared to the existing landscape)	**-27.36** (-14.47)*	**+14.9** (+2.36)	**+1,022** (+738)	**+11.18** (+13.29)	**+1.28** (+1.3)	**0** (0)

* Figures in brackets are the respective areas of habitat in the 2019 Restoration Plan

Dormant quarry permission boundary area = 50.14ha (including the High Close Farm extent)
The would be 0.93ha of native woodland planting outside the dormant quarry permission boundary immediately south of High Close Farm.
Total: 510,656.78m^2 (51.06ha)

7. Biodiversity Net Gains/Losses

Reviews of Old Mineral Permissions are not subject to forthcoming biodiversity net gain obligations contained in the Environment Bill, which is likely to be enacted and formally become legislation before the end of 2021. However, in order to assess and provide clarity on whether the proposals will result in a net gain or net loss of biodiversity details of the proposed habitat loss and restoration proposals have been run through the Defra Biodiversity Metric 3.0. The Biodiversity Metric 3.0 provides a way of measuring and accounting for biodiversity losses and gains resulting from development or land management change. The metric essentially compares the extent, condition and connectivity of habitats types and linear features such as hedgerows and rivers and streams in the pre-development site and the post development site. Habitats are used as a proxy to describe biodiversity and are converted into measurable *biodiversity units*. Biodiversity units are calculated within the metric using the size (area or length) and quality of the habitat. To assess the quality of a habitat the metric scores habitats of different types, such as woodland or grassland, according to their relative biodiversity value. Habitats that are scarce or declining typically score highly relative to habitats that are more common and widespread. The metric also takes account of the condition of a habitat. The metric accounts for the location of the habitat relative to other similar habitats to measure its connectedness in the landscape. Where new habitat is created or existing habitat is enhanced the difficulty and associated risks of doing so are taken into account by the metric.

Figures 1 to 4 below show the outputs of the metric from the 2021 restoration plan (Regulation 22 submission). For comparison Figures 5 to 8 show the results using the scheme submitted in 2019.

It can be seen that both the 2019 and 2021 restoration plans result in a net gain in biodiversity, with the 2021 plan having a slightly higher increase in habitat units and a more substantial difference in hedgerow units.

On-site baseline	*Habitat units*	**220.85**
	Hedgerow units	**16.68**
	River units	**0.00**
On-site post-intervention (Including habitat retention, creation & enhancement)	*Habitat units*	**265.06**
	Hedgerow units	**27.20**
	River units	**0.00**
On-site net % change (Including habitat retention, creation & enhancement)	*Habitat units*	**20.02%**
	Hedgerow units	**63.08%**
	River units	**0.00%**
Off-site baseline	*Habitat units*	**4.00**
	Hedgerow units	**0.00**
	River units	**0.00**
Off-site post-intervention (Including habitat retention, creation & enhancement)	*Habitat units*	**6.60**
	Hedgerow units	**0.00**
	River units	**0.00**
Total net unit change (including all on-site & off-site habitat retention, creation & enhancement)	*Habitat units*	**46.81**
	Hedgerow units	**10.52**
	River units	**0.00**
Total on-site net % change plus off-site surplus (including all on-site & off-site habitat retention, creation & enhancement)	*Habitat units*	**21.20%**
	Hedgerow units	**63.08%**
	River units	**0.00%**
Trading rules Satisfied?	**Yes**	

Figure 1 Biodiversity Metric: Summary data for 2021 Restoration Plan

Combined on site and off site change by broad habitat type						
	Baseline		On-site and Off-site post development		Combined change	
Habitat group	Existing area	Existing value	Combined proposed area	Combined proposed value	Proposed area	Proposed value
Cropland	0.00	0.00	0.00	0.00	0.00	0.00
Grassland	47.80	191.28	31.53	157.83	-16.27	-33.45
Heathland and shrub	0.04	0.16	0.04	0.16	0.00	0.00
Lakes	0.00	0.00	0.79	6.56	0.79	6.56
Sparsely vegetated land	0.27	0.54	0.03	0.06	-0.24	-0.48
Urban	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.00	0.00	0.48	1.68	0.48	1.68
Woodland and forest	2.49	32.87	17.70	105.37	15.21	72.50
Intertidal sediment	0.00	0.00	0.00	0.00	0.00	0.00
Coastal saltmarsh	0.00	0.00	0.00	0.00	0.00	0.00
Rocky shore	0.00	0.00	0.00	0.00	0.00	0.00
Coastal lagoons	0.00	0.00	0.00	0.00	0.00	0.00
Intertidal Hard Structures	0.00	0.00	0.00	0.00	0.00	0.00

Figure 2 Change in Broad Habitat type for 2021 Restoration Plan

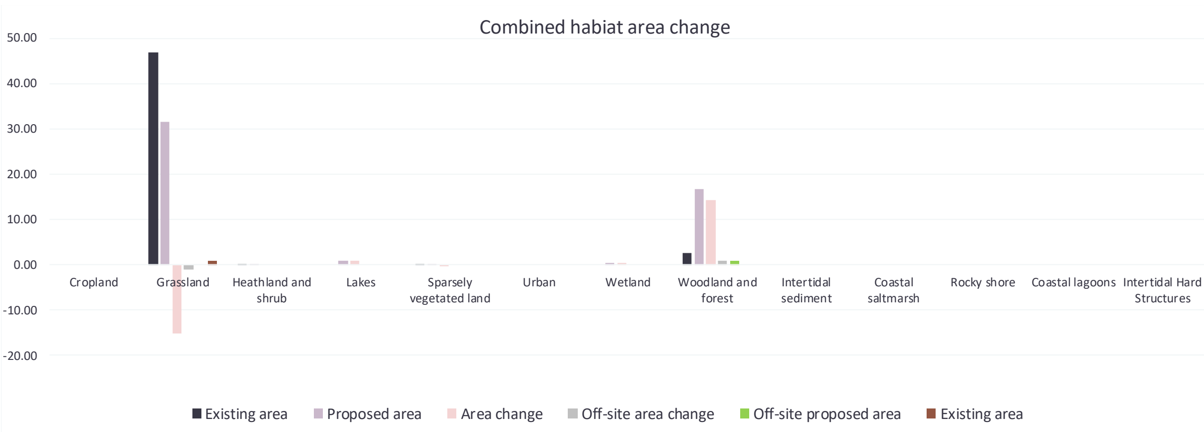


Figure 3 Biodiversity Metric: Area Change for 2021 Restoration Plan

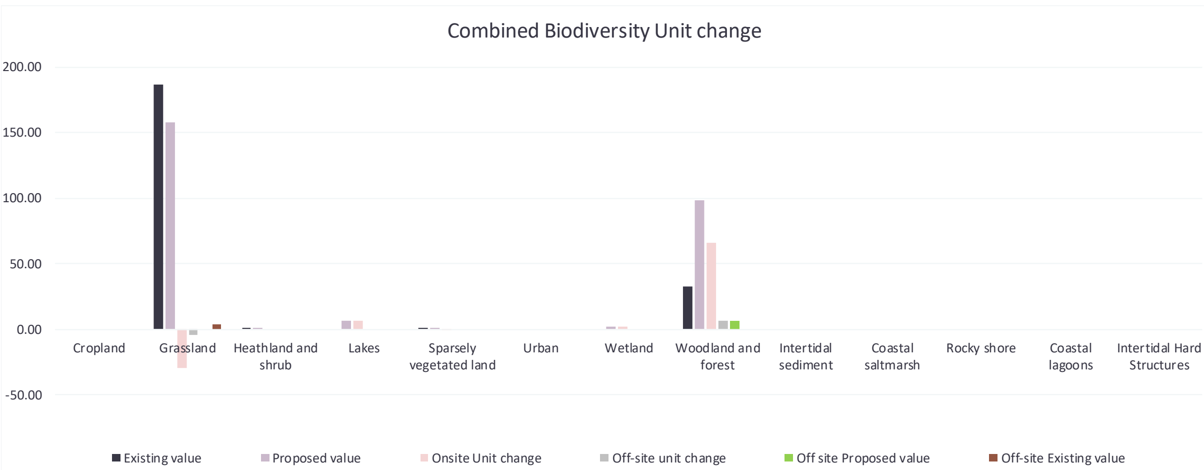


Figure 4 Biodiversity Metric: Biodiversity Unit Change for 2021 Restoration Plan

On-site baseline	*Habitat units*	**220.85**
	Hedgerow units	**16.68**
	River units	**0.00**
On-site post-intervention (Including habitat retention, creation & enhancement)	*Habitat units*	**261.41**
	Hedgerow units	**25.26**
	River units	**0.00**
On-site net % change (Including habitat retention, creation & enhancement)	*Habitat units*	**18.37%**
	Hedgerow units	**51.47%**
	River units	**0.00%**
Off-site baseline	*Habitat units*	**4.00**
	Hedgerow units	**0.00**
	River units	**0.00**
Off-site post-intervention (Including habitat retention, creation & enhancement)	*Habitat units*	**6.60**
	Hedgerow units	**0.00**
	River units	**0.00**
Total net unit change (including all on-site & off-site habitat retention, creation & enhancement)	*Habitat units*	**43.16**
	Hedgerow units	**8.58**
	River units	**0.00**
Total on-site net % change plus off-site surplus (including all on-site & off-site habitat retention, creation & enhancement)	*Habitat units*	**19.54%**
	Hedgerow units	**51.47%**
	River units	**0.00%**
Trading rules Satisfied?	**Yes**	

Figure 5 Biodiversity Metric: Summary data for 2019 Restoration Plan

Combined on site and off site change by broad habitat type						
	Baseline		**On-site and Off-site post development**		**Combined change**	
Habitat group	Existing area	Existing value	Combined proposed area	Combined proposed value	Proposed area	Proposed value
Cropland	0.00	0.00	0.00	0.00	0.00	0.00
Grassland	47.80	191.28	42.29	197.70	-5.51	6.42
Heathland and shrub	0.04	0.16	0.04	0.16	0.00	0.00
Lakes	0.00	0.00	0.78	6.53	0.78	6.53
Sparsely vegetated land	0.27	0.54	0.03	0.06	-0.24	-0.48
Urban	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.00	0.00	0.39	1.33	0.39	1.33
Woodland and forest	2.49	32.87	8.02	62.24	5.53	29.37
Intertidal sediment	0.00	0.00	0.00	0.00	0.00	0.00
Coastal saltmarsh	0.00	0.00	0.00	0.00	0.00	0.00
Rocky shore	0.00	0.00	0.00	0.00	0.00	0.00
Coastal lagoons	0.00	0.00	0.00	0.00	0.00	0.00
Intertidal Hard Structures	0.00	0.00	0.00	0.00	0.00	0.00

Figure 6 Change in Broad Habitat type for 2019 Restoration Plan

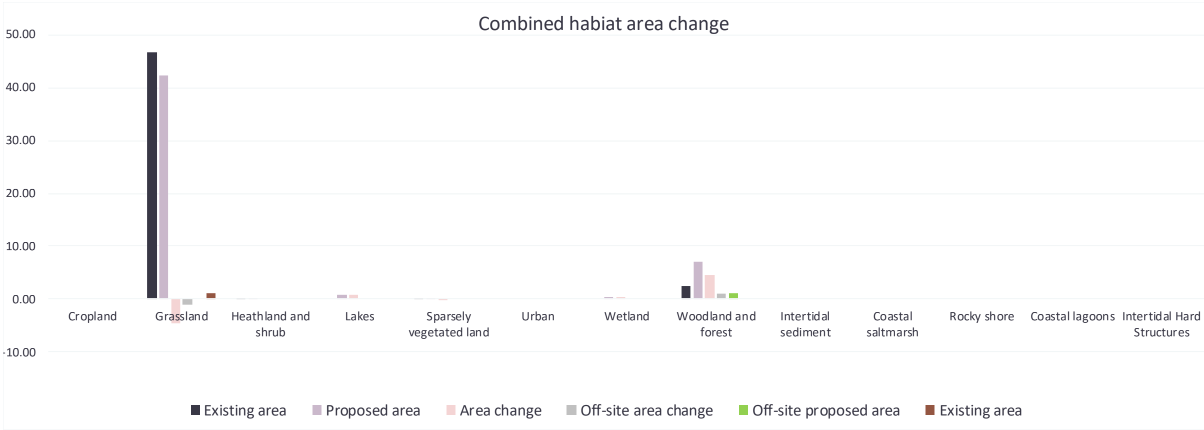
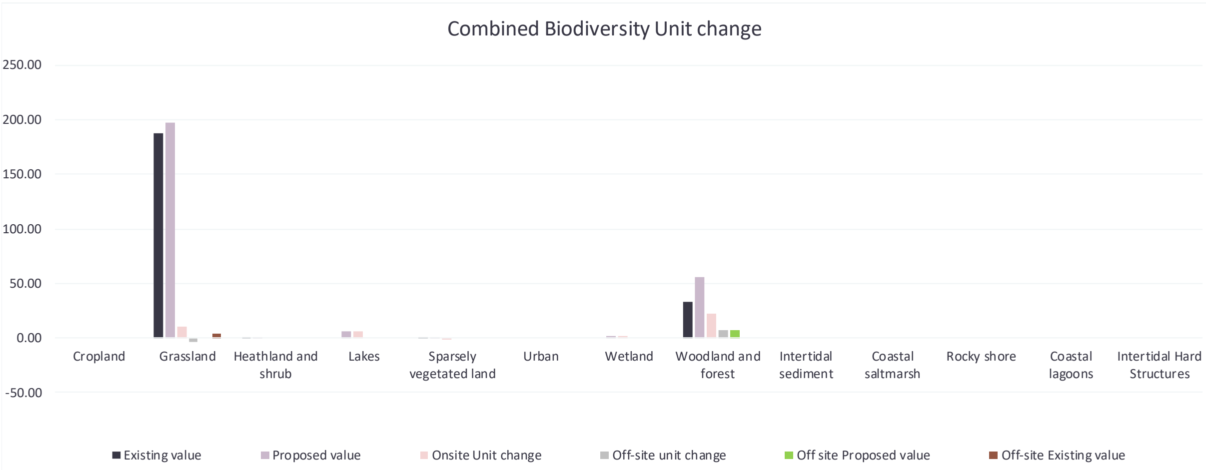


Figure 7 Biodiversity Metric: Area Change for 2019 Restoration Plan

Figure 8 Biodiversity



Metric: Biodiversity Unit Change for 2019 Restoration Plan

8. Cumulative Effects

Following a search of planning applications on the Allerdale and Cumbria County Council planning websites three significant projects occurring or planned in the vicinity of High Close Quarry which could potentially have cumulative effects in combination with the High Close proposals have been identified.

8.1. Moota Quarry

Moota Quarry is a limestone quarry lying some 850m southwest of High Close Quarry. In 2014 there was a planning application (2/14/9006) to extend the quarry into areas of improved and semi-improved grassland. The Environmental Statement accompanying the planning application concluded that restoration will result in a long-term positive effect due to the creation of extensive areas of calcareous grassland, waterbodies and native woodland, potentially providing additional habitat for the great crested newt population at Clints Quarry a few hundred metres to the west of Moota Quarry.

The restoration scheme for Moota Quarry is similar to that for High Close Quarry in that it creates large areas of calcareous grassland with areas of pools and aquatic margin vegetation, though with

Rigby Jerram ecological consultants

much smaller areas of woodland than is envisaged at High Close. It is likely that these two restoration plans will complement each other and add considerably to the extent of semi-natural vegetation in an area which currently is largely improved grassland with limited ecological value.

8.2. Clints Quarry

There are proposals in development for a limestone quarry adjacent to the southern Clints Quarry to the south of the A595 at Moota (Lake District National Park Scoping Opinion 7/2020/0001SO). This would involve the creation of a new quarry void in an area of improved grassland next to the old quarry which is subject to extant mineral planning permissions. The proposals would be accompanied by extensive habitat creation and enhancement works to improve conditions for the internationally important population of great crested newts present in the existing quarry ponds. It is likely that the proposed quarry would be restored to calcareous grassland with ponds and habitat features for great crested newts. There is no hydrological or hydrogeological connectivity between Clints Quarry and High Close Quarry.

As with Moota Quarry the restoration proposals at Clints Quarry are likely to be complementary to those at High Close Quarry and result in a net gain in terms of biodiversity.

8.3. West Cumbria Water Supplies Project

This project includes a pipeline running roughly parallel to the A595 and a service reservoir at Moota Hill at the junction of the B5301 and the A595. The section running across Moota Hill almost entirely runs through fields of improved grassland bounded by hedgerows and will be restored to the same. The project is projected to be completed by 2022 and so is unlikely to coincide with the commencement of quarrying at High Close. The pipeline is over one kilometre from High Close Quarry and there is unlikely to be any significant in-combination effects between the two projects other than that both schemes could result in temporary displacement of wintering flocks of thrushes. The in-combination effects however would be negligible as the potential habitat for such flocks includes all the fields and hedgerows in the Moota and Plumbland area and beyond so it is highly unlikely that food resources will be reduced significantly by either of these projects either alone or in combination with each other.

9. Revised Assessment of Ecological Impacts

Changes to the ecological impacts identified in the 2019 Ecological Impact Assessment together with the additional potential impacts discussed above are summarised in Table 2. It can be seen that the revised scheme results in no changes in the impacts on designated sites, including the Clints Quarry SAC.

There are however changes in the predicted long-term impacts on the lowland mixed deciduous woodland and hedgerows priority habitats, woodland birds, foraging bats and wintering birds. These positive impacts will become apparent either towards the end of the scheme (due to early woodland planting in Phase 1) or following restoration and result from the greatly increased area of native woodland (lowland mixed deciduous woodland) and additional hedgerow planting. Bats will benefit from an increased area of potential foraging habitat and improved connectivity across the site, woodland birds will benefit from an increase in extent of potential feeding and breeding habitat, whilst wintering thrushes will benefit from an increased food resource in the form of berries on hedgerow and woodland trees.

As a result of the major increase in woodland creation it is likely that **the overall impact of the scheme will be minor beneficial at the sub-parish scale in the long-term** following final restoration. For the duration of the working life of the quarry however there will be an adverse ecological impact at the local (sub-parish) scale. This operational impact is unchanged from the assessment made in the 2019 Environmental Statement, whilst the long-term final restoration impact assessment is an improvement on the 2019 assessment which was for a neutral overall impact.

Table 2 Summary of Ecological Impacts

Receptor	Change from 2019 ES?	Impact Assessment	
		Whilst Quarrying	On Final Restoration
Clints Quarry SAC	No change	No likely significant effect	No likely significant effect
Clints Quarry, Moota SSSI	No change	Neutral	Neutral
Wardhall Quarries CWS	No change	Neutral	Neutral
Marshy Grassland (Gilcrux) CWS	No change	Neutral	Neutral
Moota Outcrop CWS	No change	Neutral	Neutral
Bat roosts	No change	Neutral	Neutral
Lowland mixed deciduous woodland priority habitat	Positive	Neutral	Minor positive benefit at the local (sub-parish) scale
Hedgerows priority habitat	Positive	Neutral	Minor positive benefit at the local (sub-parish) scale
Breeding curlew	No change	Minor adverse at the local (sub-parish) scale	Neutral
Woodland birds	Positive	Neutral	Minor positive benefit at the local (sub-parish) scale
Foraging bats	Positive	Neutral	Minor positive benefit at the local (sub-parish) scale
Wintering birds	Positive	Minor adverse at the local (sub-parish) scale	Minor positive benefit at the local (sub-parish) scale
Brown hare	No change	Minor adverse at the local (sub-parish) scale	Minor positive benefit at the local (sub-parish) scale
Flatts Beck	N/A	Neutral	Neutral

10. Landscape and Ecological Management Plan

The proposed quarry is likely to have a working life of some twenty years from the initiation of Phase 1 to the completion of restoration and there is potential for there to be significant turnover of the personnel involved with the operation of the quarry during this time. To ensure that there is a consistency of approach to ecological and landscape management of the quarry during its working life it is proposed that a Landscape and Ecological Management Plan (LEMP) is produced prior to the commencement of any works on site.

The LEMP will include written information linked to a plan identifying specific habitat/vegetation compartments with a summary schedule showing timings of works/management operations. The plan will cover the whole site, including the area of off-site planting and the existing woodland to be retained.

The LEMP should include the following:

a) a description and evaluation of features to be managed;

b) ecological trends and constraints on site that might influence management;

c) the aims and objectives of management;

d) appropriate management options for achieving the aims and objectives;

e) prescriptions for management actions;

f) preparation of a work schedule (including an annual work plan capable of being rolled forward for the working life of the quarry);

g) details of the body or organisation responsible for implementation of the plan;

h) ongoing monitoring and remedial measures.

The plan shall also set out (where the results from monitoring show that conservation aims and objectives of the LEMP are not being met) how contingencies and/or remedial action will be identified, agreed and implemented so that the development still delivers the fully functioning biodiversity objectives of the originally approved scheme. The approved plan will be implemented in accordance with the approved details.

10.1. Suggested Landscape and Ecological Management Plan Condition

1. No ground clearance, tree works or soil stripping shall take place until a Landscape and Ecological Management Plan (LEMP) addressing landscape and biodiversity protection, enhancement and management during the continued extraction of limestone hereby permitted has been submitted to the Mineral Planning Authority. The issues which shall be addressed in the LEMP include:

    i. Identification and evaluation of the landscape and ecological features to be managed;

    ii. Aims and objectives of management on the site;

    iii. Measures to be taken to protect habitat and species present on site as identified in paragraphs 7.15 to 7.33 in Chapter 7 of the 2019 High Close Quarry, near Cockermouth, Cumbria Dormant Planning Permission Ref CA49 Environmental Statement;

    iv. Details of habitat creation as shown on the approved drawing: [restoration masterplan], comprising phasing and method statements for the creation, establishment and aftercare management of each habitat type to include:

        a. Woodland and hedgerows
        b. Calcareous grassland
        c. Bat mitigation measures before, during and after tree removal

   d. Wetland habitats including marginal aquatic vegetation

v. A timetable detailing:

   a. The carrying out of all habitat protection and creation measures,
   b. The implementation of habitat and species management for the duration of limestone extraction hereby permitted,
   c. Details of the annual review and update of the LEMP.

vi. A clear detailing of legal, financial and management responsibilities relating to the LEMP which will ensure the successful completion of its aims and objectives.

The development shall be carried out in accordance with the approved LEMP including any revisions as agreed in writing by the Mineral Planning Authority thereafter.

Reason: To protect and enhance landscape character and ecological interests.

11. Bat Survey Report

Bat Tree Survey
High Close

Prepared for: Thomas Armstrong
Date: April 2020Reference: Q188-D01
Revision: 02

Flight Ecology
Ecological Training and Consultancy

32 Firs Road, Milnthorpe Cumbria, LA7 7QF
www.flightecology.co.uk rich@flightecology.co.uk

CONTENTS

SUMMARY

Flight Ecology were commissioned to undertake an inspection survey of the trees at High Close, near Parsonby, Cumbria. It is proposed to excavate an open quarry in the fields at High Close. This will involve the removal of an area of trees from the existing shelter-belt woodland which borders the western edge of the site.

Previous survey work has been carried out by Rigby Jerram Ecological Consultants and SK Environmental Solutions Ltd, in 2016 and 2018, respectively. As part of this survey work, a small number of trees were identified as having roosting bat potential.

A new Ground Level Tree Inspection was carried out in the wood and an Aerial Tree Inspection was carried out of trees that had previously categorised as moderate or high potential, along with any other trees that demonstrated potential for roosting bats.

Flight Ecology have reassessed the four moderate and high potential trees and reclassified them according to current evidence. Three of the trees now provide high potential for roosting bats and one remains classified as having moderate potential. In addition, Flight Ecology identified several additional trees with roosting bat potential, this included one tree with high potential, one with moderate/high potential, and four with moderate potential.

The changes observed in the roosting potential of the woodland between the surveys two years apart demonstrates that any results from a full survey of the trees now would be out of date and, in some cases, completely irrelevant by the time the trees were removed.

It has therefore been concluded that a full inspection survey of the trees would not be practical at this time. Instead, a precautionary principle based on existing data will be devised, to be supported by further survey-work closer to the time of tree felling.

This approach also has the following advantages:

- The intervening time will allow replacement habitat to be planted and become established as mitigation for lost habitat;
- The intervening time will enable more records to be collated within the Bat Tree Habitat Key so that a more informed decision can be made;
- Survey work can be started well in advance of the planned tree-felling so that a scientifically robust data set can be collected to inform the mitigation plan.

Recommendations have therefore been made for habitat enhancements and mitigation for any roosts that are found during subsequent inspection surveys.

INTRODUCTION

Background

1.1 Flight Ecology were commissioned to undertake an inspection survey of the trees at High Close, near Parsonby, Cumbria.

1.2 The inspection survey relates to a Review of Old Minerals Permission submission, submitted by Thomas Armstrong Limited. It is proposed to continue quarrying at High Close Quarry. Continued quarrying can only occur following the agreement to a set of modern planning conditions under which future operations will be undertaken.

1.3 The development proposed will be progressive over time and is illustrated on the Indicative Quarry Development Plans as 5 phases, each depicting a snapshot in time, with a final restoration plan.

1.4 This development will include excavating an open quarry at High Close. This will involve the removal of an area of trees from the existing shelter-belt woodland which borders the western edge of the site. The phased quarry development will require the removal of trees identified as having high bat roost potential approximately 3- 6 years following the commencement of development.

1.5 The proposal includes appropriate habitat management, mitigation and restoration to be undertaken in tandem with the quarry development. This will be delivered as part of a Landscape and Ecological Management Plan. The LEMP will encompass all landscape and ecological works required to mitigate and compensate for the effects of quarrying. An Extended Phase 1 Habitat Assessment was carried out by Rigby Jerram Ecological Consultants in August 2016, followed by a Ground Level Tree Assessment by SK Environmental Solutions Ltd in January 2018 and an Aerial Tree Inspection in February 2018. SK Environmental Solutions Ltd also carried out a Bat Transect Survey during the summer of 2018, which included the belt of woodland.

1.6 During the tree inspections in 2018, two trees were identified as having Potential Roost Features (PRF's) with high potential to support bat roosts and two were found to have moderate potential. Numerous others were inspected but were all found to have low or negligible potential.

Survey Objectives

1.7 The purpose of the survey was therefore to:

- Re-inspect the trees with moderate or high bat potential and determine their current potential to support roosting bats;
- Identify whether any other trees have potential for roosting bats;
- Determine whether any of the PRF's have evidence of bat usage; and
- Provide recommendations regarding any potential impacts to bats and bat habitat.

1.8 The instructed works comprised a ground level tree inspection and a single aerial tree inspection.

Site Description

1.9 The proposed development site comprises an area of rural grazing land to the south of the small village of Parsonby, near Cockermouth in north Cumbria. There is a small farm (High Close Farm) just beyond the north-eastern corner of the development site.

1.10 The western edge of the boundary consists of a shelter-belt of woodland, approximately 75m wide by 520m long; this woodland is the focus of this survey. To the west of this woodland, just outside the site boundary, runs the B5301 road, which follows a generally north-south orientation alongside the site. Consultation of archive maps suggests that woodland has been present within the existing location since at least 1866.

1.11 Within the remainder of the site, the field boundaries comprise fragmented native hedgerows which has been replaced in numerous places with post-and-wire fences. There are no significant trees within the hedgerows. However, a small number of more mature trees are located within the most northerly site boundary. There is also another pocket of woodland in the north-eastern corner of the development site, alongside the farm. Other woodland can be found approximately 450m to the west of the study area, approximately 600m to the south-west and a tree-lined watercourse approximately 1.4km to the east of the study area.

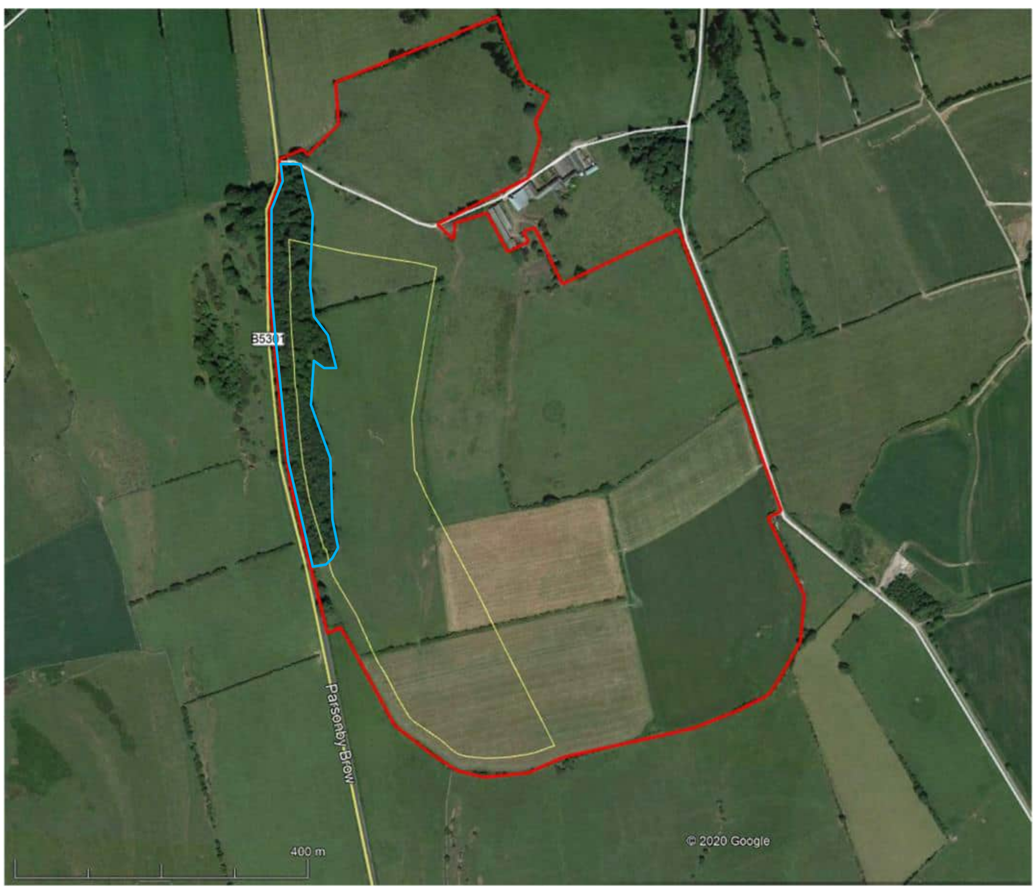


Figure 1: Aerial plan of proposed development site (red line boundary), initial excavation area(yellow line boundary) and woodland (blue line boundary)

METHODOLOGY

Ground Level Tree Assessment (GLTA)

2.1 An inspection was carried out of the trees within the woodland. Trees were inspected for features that may provide potential roosting features for bats. Any features identified were compared to results from the initial GLTA in 2018.

2.2 Trees were examined from the ground with the aid of binoculars and a high-powered torch. Trees were inspected for cavities, crevices, defects and other such damage and decay wounds that may provide roosting opportunities for bats.

2.3 Such features include, but are not restricted to;

- Woodpecker holes;
- Knot holes;
- Branch tears;
- Damage wounds;
- Hazard beams;
- Callused wood;
- Cankers;
- Fused branches or stems; and/or
- Lifted bark.

2.4 These features are known to provide suitable roosting habitat for bats (Bat Roosts in Trees, Pelagic Publishing, 2018).

2.5 The survey was undertaken on two dates, 24th February and 18th March 2020 by Rich Flight, a Natural England class 2 bat licenced ecologist and William Walton, a Natural England class 1 bat licenced ecologist.

2.6 Features were divided into the following categories;

- Negligible Potential: The feature can clearly be seen to be superficial or lacking in characteristics that might provide suitable bat roosting potential.
- Low Potential: The feature appears to extend into the tree but can be seen to be sub-optimal in some way; e.g. too shallow, too open, too wet etc;
- Moderate or High Potential*: The feature appears to extend into the tree beyond what can be viewed with the naked eye or binoculars. However, usage by bats cannot be ruled out until a closer inspection has been undertaken;

- Confirmed: Bat usage has been confirmed from the ground; either bats or definitive bat droppings have been found during the inspection.

*At the stage of GLTA, without closer inspection, it is not possible to distinguish moderate fromhigh potential.

Aerial Tree Inspection

2.7 The survey was undertaken on 24th February 2020 by Rich Flight, a Natural England class 2 bat licenced ecologist and William Walton, a Natural England class 1 bat licenced ecologist.

2.8 Trees that had previously been identified as possessing potential for bats, either during the GLTA or from previous surveys (SK Environmental Solutions 2018), were inspected in more detail through a climbed aerial inspection.

2.9 Features were inspected in detail with torches and a video endoscope to establish the presence or absence of bats. Evidence could be:

- Bats;
- Droppings;
- Bat-specific parasites;
- Staining and internal smoothing; and
- Distinctive odour.

2.10 Where no evidence of bats could be found, an assessment was made of the feature regarding its potential to support roosting bats, based on the structure and condition of the internal.

2.11 Suitability for roosting bats is determined using the following rationale:

- Negligible – feature is not structurally suitable for roosting bats (e.g. too small, or shallow).
- Low Potential – structurally, the feature could support a bat or bats, but factors such as size, shape, exposure, openness to predators etc, suggest that roosting is unlikely.
- Moderate Potential – feature is structurally suitable, but no evidence can be found (primary or secondary). Feature may only be used occasionally and therefore no evidence remains.
- High Potential – feature is structurally suitable and bat roosting is suspected through secondary evidence (e.g. staining, smoothing, or odour).
- Confirmed – bat roosting is confirmed by primary evidence (e.g. bats, droppings or bat specific parasites) Inspection

Legislation and Planning Policy

Bats

2.12 The Conservation of Habitats and Species Regulations 2010 (as amended) and the Wildlife and Countryside Act 1981 (as amended) provide legal protection to all UK bat species.

2.13 In summary, a person may be guilty of an offence if they:

- Damage or destroy a breeding or resting place of bats;
- Deliberately capture, injure or kill a bat/s;
- Deliberately disturb bats, and in particular disturbance likely to impair animals' ability to survive, breed or nurture young, their ability to hibernate and migrate and disturbance likely to have a significant effect on local distribution and abundance;
- Intentionally or recklessly disturb a bat/s while occupying a structure or place used for shelter and/or protection (Wildlife and Countryside Act 1981 (as amended)); and
- Intentionally or recklessly obstruct access to any structure or place that a bat/s use for shelter or protection (Wildlife and Countryside Act 1981 (as amended)).

2.14 The legislation applies to bat roosts even when they are not occupied.

2.15 Maximum penalties are punishable with fines up to £5,000 per offence and up to 6 months' imprisonment. Actions affecting multiple animals may be construed as separate offences and therefore there is potential for penalties to be applied per animal impacted.

2.16 Under certain circumstances licences can be granted by the Statutory Nature Conservation Organisation (Natural England in England) to permit actions that would otherwise be unlawful.

2.17 Local authorities have obligations under sections 40 and 41 of the Natural Environment and Rural Communities Act (NERC) 2006 to have regard to the purpose of conserving biodiversity in carrying out their duties. Seven species of bat species are listed on Section 41 the NERC Act.

Limitations

2.18 Only one inspection survey was commissioned, which was carried out during the winter period.

2.19 It was not possible to inspect all aerial features as some were considered to be too dangerous to inspect using rope access techniques.

2.20 There were no other restrictions to the surveys; the weather during both visits was considered to be suitable for surveys.

2.21 Although previous surveys were carried out by a different company, Rich Flight performed the previous GLTA and aerial surveys in 2018 also, whilst working for SK Environmental Solutions Ltd; therefore, ensuring consistency of inspection technique and categorisation.

RESULTS

Desk Study

2.22 Eight species of bats have been recorded breeding in Cumbria; whiskered Myotis mystacinus, Brandt's Myotis brandtii, Natterer's Myotis nattererii, Daubenton's Myotis Daubentoni, noctule Nyctalus noctula and brown long-eared bats Plecotus auritus, common pipistrelle Pipistrellus pipistrellus and soprano pipistrelle and P. pygmaeus.

2.23 According to Birds and Wildlife in Cumbria 2010/11' – A County Natural History Report the status of the above species are as follows:

- Whiskered bat – widespread;
- Natterer's bat – widespread near water;
- Noctule – widespread but local;
- Brown long-eared bat – common and widespread;
- Common and soprano pipistrelle – common and widespread;
- Brandt's bat – local (2005/07 edition); and
- Daubenton's bat – widespread but local (2005/07 edition).

2.24 A further two bat species have been identified in Cumbria through auditory detection alone, with no roosts being found: Nathusius' pipistrelle Pipistrellus nathusii and Leisler's bat Nyctalus leisleri.

2.25 During the previous surveys, undertaken by SK Environmental Solutions Ltd, no roosts were located. Activity surveys (transects and remote static detection) undertaken during the summer of 2018 detected a minimum of five species;

- Common pipistrelle;
- Soprano pipistrelle;
- Brown long-eared;
- Noctule; and
- Myotis sp. bats.

2.26 The latter were not distinguished to species level, and were recorded to family level only. The overwhelmingly dominant species during transect surveys were common and soprano pipistrelle bats. However, static detection collected a greater proportion of Myotis sp. bats.

Ground Level Tree Inspection

3.7 Walkover surveys were carried out on the 24th February and 18th March 2020 to assess the trees from the ground. Trees that had previously been inspected in 2019 were re-inspected to look for changes in conditions.

3.8 In general, the trees were found to be a mix of ages, from young to moderate and early mature age. There is a lack of mature, over-mature or veteran trees within the wood. There is also a prevalence of ivy within the wood, which has a tendency to clutter the arboreal habitat without providing additional roosting opportunities.

3.9 The trees were found to be generally growing relatively close to each other, which encourages rapid upward growth with little lateral reach. The trees are therefore relatively tall and narrow in structure. This can make them susceptible to windthrow and there are several examples of wind-blown trees within the study area.

3.10 For more detail regarding the woodland habitat, refer to the previous phase 1 survey by Rigby Jerram (Rigby Jerram Ecology 2016) and the previous tree survey by SK Environmental Solutions Ltd (SK Environmental Solutions 2018).

3.11 During the survey, six additional trees with potential for roosting bats were found. Five of these were inspected in detail. One tree, BT13, was not climbed for health and safety reasons and therefore was not inspected in detail at this time. BT14 was partially inspected from a ladder, but also due to health and safety concerns, could not be inspected to its highest extent, as rope access was not considered to be safe.

3.12 The results of the GLTA inspections are grouped with the Aerial Inspection in Table 1, below.

Aerial Inspection

3.13 On 24th February 2020, an Aerial Inspection was carried out of the trees previously categorised as having moderate or high potential for bats (SK Environmental Solutions 2018).

3.14 Other trees identified during the GLTA as having bat potential were also inspected in detail, either from the ground or from a ladder. The results from all close inspections can be found in Table 1, below.

3.15 Of the two trees classed as having high potential for bats during the 2018 survey, both these retain high potential, the only change being that a secondary feature on BT05 has increased in potential from negligible to moderate.

3.16 Of the two moderate potential trees that were climbed, BT01 has increased in potential to include one feature that now has high potential; other features retain moderate or low potential. BT02 presented no significant changes to the internal conditions.

3.17 The locations of the trees listed in the table can be seen in figure 2 below.

Tree (tag) Number	Species	Height	Width (at breast height)	Condition / Maturity	Grid ref	Position in Landscape	Potential Roost Feature (PRF)	PRF aspect	Height	Upward Extension (cm)	Downward Extension (cm)	Notes	Previous Potential	Current Potential
BT01 (#1426)	Acer pseudoplatanus	14m	0.5m	Mature	NY 14392 38424	Next to track entry	Basal Rot	NW	0m	5	0	No significant change	Low	Low
							Wound	NE	7m	60	0	On main stem, extends a reasonable distance. Contained mosquitoesand woodlice. Sides are smooth but entrance is slightly open. Some debris also.	Moderate	Moderate
							Weld	W	8m	0	30	Extends downwards behind a flake of dead wood. Dry and clean.	NA	**High**
BT02 (#1427)	Carpinus betulus	16m	0.45m	Mature	NY 14379 38317	On bank beside road	Split	W	0-2.5m	20	0	No significant change	Moderate	Moderate
BT05 (#1424)	Quecus sp.	18m	0.7m	Mature	NY 14396 38280	Alongside path	Knot hole	S	11m	15	0	Extends approx 15cm. Dry on one side and damp on other. Contains some bird droppings	High	**High**
							Tear	S	6-7m	20	0	Small cavity on right hand side at the base. Extends up approximately 20cm , not polishedthough. Some bird droppings.	Negligible	Moderate
BT10 (#1425)	Fagus sylvatica	20m	0.9m	Mature	NY 14415 38307	Alongside path	Tears	NW	2-12m & 10-15m	70	20	Extends approx 70cm upwards. Clean and dry in places, damp in others. Contains woodlice, slugs and bird droppings. Smooth in places, blackened and has musty smell. However, the start of it is large enough for a squirrel to enter. Lower tear has jackdaw nestin it.	High	**High**
BT11	Fagus sylvatica		0.35m & 0.37m	Mature	NY 14429 37915		Tear	Eastern limb, NE-facing feature	1.4m	85	0	Twin stem tree. Tears on both limbs, but only one has potential for bats. Feature extends ~85cm up to clean tapering cavity. Dry in places but aalso has wet patches. Slugs and woodlice present.	NA	**High**
BT12	Fraxinus excelsior	19m	0.28 (0.33 & 0.40)	Mature	NY 14416 38142		Knot Hole	North-facing on main stem		50	0	Triple stem tree. Smooth inside, slugs and woodlice present, cavernous shamber. Humus in bottom, chambered apex	NA	Moderate
BT13	Fraxinus excelsior	20m	0.41m	Mature	NY 14413 38229	Next to path	tear	North-east facing on stub	10m	NA	NA	Tall, straight tree with few limbs. Did not climb, so no internal details.	NA	**Moderat e / High**
BT14	Fraxinus excelsior	15m	0.27m	Mature	NY 14386 38215		Lightning strike	All	1-9m	Potentially 8m+	0	Crack up stem, twisting round trunk. Open all the way, but does provide shelter in places. Not safe to climb and extends beyond ladder distance. Where inspected, dry and rough with some clutter around entrance.	NA	Moderate
BT15	Sorbus aucuparia	9m	0.1m	Semi-mature	NY 14413 38229	Next to path	Knot Hole		1.1m	20	20	Dry and clean upward extension to a dome. Polished entrance. Dirty downward extension.	NA	Moderate
BT16	Fraxinus excelsior	3.2m		Dead	NY 14389 38267		Bark damage / frost crack	NW facing	0.5m	35	0	Dry and dirty internally. Millipedes and snails near entrance	NA	Moderate

Table 1: Inspection results

Figure 2: Locations of trees with potential to support bats.

DISCUSSION AND CONCLUSIONS

Discussion

2.27 During the previous ground level tree assessment survey, carried out by SK Environmental Solutions Ltd in 2018, ten trees were identified as having potential for roosting bats. Following a climbed inspection, just two of those were classed as having high potential and two were classed as having moderate potential. The remaining six were classed as low or negligible.

2.28 Following an update survey carried out in 2020, Flight Ecology have reassessed the four moderate and high potential trees and reclassified them according to current evidence. Three of the trees now provide high potential for roosting bats and one remains classified as having moderate potential.

2.29 In addition, Flight Ecology identified several additional trees with roosting bat potential, this included one tree with high potential, one with moderate/high potential, and four with moderate potential.

2.30 No definitive evidence of roosting bats was found during the surveys. However, the internal conditions of those classed as high potential was indicative of roosting bats; the internal surfaces were smooth, free of debris, and at least partially dry. These environmental indicators provide some evidence that an animal has passed over the internal surface on multiple occasions. Without the influence of animals within a tree cavity, the conditions tend to remain rough and dirty.

2.31 Where trees were classified as having moderate potential, the features were structurally suitable for roosting bats but no environmental indicators were observed. This may be an indication that the feature is not used with enough regularity to influence the internal conditions. Bats are transient in nature and may visit a feature occasionally as part of a network of roosting locations within a home range.

2.32 Of the trees identified, three lie within the proposed excavation zone (BT12, 13 & 15), while a further three lie on the boundary (BT05, 10 and 11); see figure 2 for locations. All of these trees are likely to be impacted by the proposed excavations, either directly or indirectly. Those trees that are within the zone will be felled prior to excavation commencing. This will not be immediately after works commence, but will correspond with the extraction zone reaching the woodland; it is understood that extraction will commence in the eastern areas and work towards the western side, which includes the woodland. It is therefore understood that these trees are likely to be felled following a period of between three to six years from the date that planning permission is granted.

2.33 Here trees lie just outside the excavation zone they may still be impacted by disturbance, both during felling or during excavation. They may also be impacted by exposure, affecting the conditions of the roost habitat. Where the neighbouring trees are felled, the potential roost tree will be suddenly exposed to novel environment factors, such as greater rainfall, stronger winds and greater exposure to potential predators. This may make the roost features less favourable or, in extreme scenarios, unviable as bat roosts.

2.34 During the survey, the classification of the potential roost features was based on the external and internal conditions of the feature. However, tree roost features vary widely in nature and therefore suitability for bats. Some features have been found to be more suitable for certain species, while some have been found to be widely ignored by bats. The Bat Tree Habitat Key Database (Andrews Ecology, 2020) is an open source database which logs known bat tree roosts in the UK as a reference tool and way of analysing trends between roosts. At the time of writing, it contained 7377 records of PRF's some with and some without bat occupancy.

2.35 The database was therefore interrogated to compare the features found at High Close to those on the database of known roosts. The results are below in Table 2; only tree species and feature types that have been found at High Close are listed.

2.36 The table should be read along each row, beginning with the tree species in question (e.g. Acer Pseudoplatanus); the table then lists the number of confirmed roost records for that species. To the right of that, the table then lists the PRF type found at High Close (e.g. Basal rot, Wound or Weld) and the number of confirmed roost records for that PRF type (within the tree species in question), including the range of bat species (only records of bat species that can be found in Cumbria were searched for).

2.37 Finally, the table lists the heights of the features found at High Close and how many records of roosting bats exist on the database, including species (a deviation of 1m up and down was allowed when retrieving these figures).

2.38 From the table, it is clear that wounds in Sycamores Acer Pseudoplatanus are the most frequently used of the features found at this site, with 52 records of bat roosts on the database. However, there are no records of bat roosts in wounds at around 7m. This lack of data may be a reflection of effort bias, as more low-level features can be inspected than high level features, due to the difficulty of getting high into trees; it is known that there is a disproportionate amount of low-level roosts than high-level on the BTHK.

2.39 The second most well used PRF type is the tear in an oak Quercus sp., with 12 records listed. When heights of roost were taken into account, this number dropped to just three records. Of the PRF types and heights, there were several categories that returned no records at all, including the knot hole in the Rowan Sorbus aucuparia in which there are no records of tree roosts at all.

2.40 Of the features classified as having high potential during the inspection, none of them have more than one record of similar roosts on the database. As indicated above however, this may be a matter of under-recording as opposed to absence of roosting bats.

2.41 During the 2018 activity surveys, the dominant species on site were common and soprano pipistrelles, with some Myotis family bats and a low number of noctule bats recorded. From the records in Table 2, it shows that some features have been found to be used by brown long-eared bats Plecotus auritus only. This species appears to be absent from or present in very low numbers on site.

2.42 Pipistrelle bats are known to roost in trees, often in low numbers, as their large maternity roosts tend to be located in buildings. The table below indicates that most likely roost location in High Close to find them would be knot hole in BT12 and the tear in BT05, and potentially the wound in BT01 (as data may be deficient for roosts of the height recorded).

Tree Species	No. of unique roost records	Tree (tag) Number	Potential Roost Feature (PRF)	Survey Potential	No. of unique roost records	Bat Species Recorded	PRF Height	No. of unique roost records	Bat Species Recorded
Acer pseudoplatanus	69	BT01 (#1426)	Basal Rot	Low	1	Myotis nattereri	0m	1	Myotis nattereri
		BT01 (#1426)	Wound	Mod	52	Myotis daubentonii Myotis nattereri Nyctalus noctula Pipistrellus pipistrellus Pipistrellus pipistrellus & Pipistrellus pygmaeus Pipistrellus pygmaeus Pipistrellus sp. Pipistrelluspygmaeus Plecotus auritus	7m	0	NA
		BT01 (#1426)	Weld	High	0	NA	8m	0	NA
Carpinus betulus	4	BT02 (#1427)	Split	Mod	0	NA	0-2.5m	0	NA
Fagus sylvatica	33	BT10 (#1425)	Tear	High	2	Myotis daubentonii Myotis nattereri Pipistrellus sp.	10-15m	0	NA
		BT11		High			1.4m	1	Myotis daubentonii/ Myotis nattereri
Fraxinus excelsior	49	BT12	Knot Hole	Mod	2	Myotis daubentonii Pipistrellus pygmaeus	2m	1	Pipistrellus pygmaeus
		BT13	tear	Mod / High	6	Myotis daubentonii Myotis nattereri Nyctalus noctula Pipistrellus pipistrellus Pipistrellus pygmaeus	10m	2	Myotis daubentonii Nyctalus noctula
		BT14	Lightning strike	Mod	0	NA	1-9m	0	NA
		BT16	Bark damage / frost crack	Mod	3	Pipistrellus pipistrellus Plecotus auritus	0.5m	1	Plecotus auritus
Quecus sp.	345	BT05 (#1424)	Knot hole	High	6	Myotis daubentonii Myotis nattereri Plecotus auritus	11m	1	Plecotus auritus
		BT05 (#1424)	Tear	Mod	12	Myotis nattereri Nyctalus noctula Pipistrellus pipistrellus Pipistrellus pygmaeus Plecotus auritus	6-7m	3	Nyctalus noctula Pipistrellus pygmaeus
Sorbus aucuparia	0	BT15	Knot Hole	Mod	0	NA	1.1m	0	NA

Conclusions

2.43 No proven bat roosts have been discovered during the survey work undertaken. The woodland has been shown to have moderate potential for suitable potential roost features to form and some trees have been identified that have suitable roosting locations. However, in general, the woodland is relatively isolated and activity survey work has shown bat activity levels to be relatively low, with a restricted amount of habitat continuity in the area leading to a lower number of bat species encountered than one might find in a more continuous wooded area.

2.44 Between the 2018 surveys and the 2020 survey, the potential for trees to support PRF's has changed, in some cases getting greater. It is reasonable to conclude that during the intervening time between the 2020 update survey and the removal of the trees, during phase 2 of the development (in potentially six years time) the roosting potential of the PRF's within the wood will also alter. Those that currently provide high potential habitat may well be lost to wind damage and those that currently provide low or moderate potential may improve to become high-potential. In addition, new features will inevitably be created by storm action and decay.

2.45 It has therefore been concluded that a full inspection survey of the trees would not achieve the required result of accurately informing on the impacts incurred by the proposed development. The changes observed in the roosting potential of the woodland between the surveys two years apart demonstrates that any results from a full survey of the trees now would be out of date and, in some cases, completely irrelevant by the time the trees were removed.

2.46 From an ecological perspective, it is therefore more advantageous to survey the trees closer to the felling date, when results will be more accurate and relevant. Therefore, a precautionary principle based on existing data should be devised, to be supported by further survey-work closer to the time of tree felling.

2.47 This approach also has the following advantages:

- The intervening time will allow replacement and additional habitat to be planted and become established as mitigation for lost habitat. This will be undertaken in accordance with the proposed Landscape and Ecological Management Plan, ensuring appropriate mitigation of effects is achieved and allowing compensatory habitat to mature prior to any tree removal;

- The intervening time will enable more records to be collated within the Bat Tree Habitat Key so that a more informed decision can be made; and

- Survey work can be started well in advance of the planned tree-felling so that a scientifically robust data set can be collected to inform the mitigation plan.

2.48 At the present time, following the most recent survey effort, at least four trees in the area to be affected by Phase 2 development have been found to have high potential for roosting bats. For the purposes of mitigation planning and until further detailed survey work is carried out, it should therefore be assumed that at least one of the PRF's in this woodland area is used by bats and therefore appropriate mitigation will be required.

2.49 Adopting a precautionary principle approach, the impact to these trees can be adequately mitigated for through mitigation and compensation, i.e. the provision of additional suitable habitat and inclusion of additional roosting opportunities in the existing woodland; all of whichwill be incorporated as part of the proposed LEMP.

2.50 The habitat within the woodland is likely to provide good foraging habitat for bats, most notably pipistrelle bats and Myotis bats. The previous activity survey work carried out by SK Environmental Solutions Ltd indicated that pipistrelle bats (both common and soprano) were the most common species' on site with a low number of Myotis bats, occasional noctules and just four passes of brown long-eared bats during the whole survey. The woodland provided the greatest concentration of the bat activity on site, with a lesser number of bats found along hedgerows and roads. Therefore, not only will the removal of the woodland have potential impacts to the roosting habitat on site, but it will also have an impact on the feeding capacity of the site.

2.51 The LEMP would address the potential identified effects of the proposals upon bat roosting habitat. It is proposed to achieve this through the creation of additional habitat prior to the removal of the trees known to support bats and also via mitigation measures at the point of tree removal linked specifically to the habitat loss occurring at that time. In order to mitigate for the loss of feeding habitat, replacement trees will be planted on or near to the proposed excavation site. This will provide an alternative feeding resource for the bats. Other features may also be included to increase the foraging potential of the site, such as wetland areas and thicker hedgerows; in numerous places, the hedgerows have been replaced with cheaper and simpler post and wire fences. However, these provide very little ecological benefit to a location. These actions can be encompassed and coordinated as part of the proposed LEMP.

2.52 Despite the need to provide mitigation habitat on site, as not all of the woodland will be lost, it will not lose all of its ecological benefit, not least for bats. As the majority of trees will remain, this will continue to act as a foraging and commuting feature in the landscape for bats. The retained habitat would be part of an improved and more interconnected network of hedgerow and woodland habitat, as proposed in the amended Restoration Masterplan.

RECOMMENDATIONS

2.53 Based on the survey work carried out by SK Environmental Solutions Ltd in 2018 and Flight Ecology in 2020, the following recommendations are made;

2.54 Further Survey Work

- No trees are to be felled until:
    - An appropriate tree bat roost survey is undertaken that shall include an assessment of all Potential Roost Features to be affected by the removal of trees;
    - This survey work shall establish the presence of bats within any identified PRF's for a duration and appropriate range of seasons to assess its full use by bats;
    - The assessment shall include details of any required mitigation measures needed to address the impacts of woodland loss identified at that time.

2.55 Habitat Compensation

- A Landscape and Ecological Management Plan (LEMP) is proposed prior to any works commencing;

- The LEMP will identify areas for the planting of trees as mitigation for the proposed loss of habitat within the existing woodland and will include a schedule for its establishment prior to the felling of the woodland;

- The trees to be planted will comprise native or naturalised species, such as oak Quercus sp., sycamore Acer pseudoplatanus, beech Fagus sylvatica, yew Taxus baccata, silver birch Betula pubescens, and field maple Acer campestre.

- The LEMP will include details of other habitat features to support bat populations, for example wetland habitat areas and measures to ensure the continuity of suitable habitat between the existing woodland and the mitigation planting. This will include continuous planted hedgerow and hedgerow trees.

2.56 Roost Removal

- Should any bat roosts be identified during the subsequent surveying then an appropriate derogation license will need to be applied for from Natural England; at present, this would comprise a European Protected Species Mitigation License;

- Measures must be put in place to minimise any disturbance to roosting bats during the felling process; this will include bats roosting in trees that are not scheduled to be removed but which may be indirectly impacted by the works;

- Any roosts in trees that are to be felled should be removed in their entirety and re-erected in a nearby tree, in as similar situation as possible to its original position;

- A buffer of at least one tree around a known roost tree must be left un-felled, so as to provide a cushion against the disturbance impacts of the felling process and quarry activities;

2.57 A minimum of twelve bat boxes should be erected in the remaining woodland. These should comprise or be similar to Greenwoods EcoHabitats crevice and cavity boxes.

REFERENCES

Altringham, J.D. (2003) British Bats. Harper Collins, London

Barlow, K., Jones, G.(1999) Roosts, echolocation calls and wing morphology of two phonic types ofPipistrellus pipistrellus Z. Saugertierk

Bat Conservation Trust (2009) The National Bat Monitoring Programme – Annual Report 2009. BatConservation Trust, London. (available at www.bats.org.uk/pages/nbmp_reports.html)

Collins, J. (ed.) (2016) Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edn). The Bat Conservation Trust, London.

Dietz, C., Nill, D. & von Helversen, O. (2009) Bats of Britain, Europe and Northwest Africa.A & C

Black (2004). Bat Workers' Manual. 3rd edition. JNCC

Natural England (undated). Standing Advice Species Sheet: Bats

SK Environmental Solutions Ltd (2018) JN00343/D01: Aerial Tree Bat Survey ReportSK

Environmental Solutions Ltd (2018) JN00343/D02: Bat Transect Survey Report

PHOTOGRAPHS

Photograph 1: Tree BT01

Photograph 2: BT16

Photograph 3: Tree BT05

Photograph 4: BT05 Detail

Photograph 5: Tree BT10

Photograph 6: BT10 Detail


Photograph 7: BT12


Photograph 8: BT12 detail


Photograph 9: BT13


Photograph 10: BT13 detail


Photograph 11: BT14


Photograph 12: BT14 detail

12. Red Squirrel Survey Report

Red Squirrel Survey
High Close

Prepared for: Thomas Armstrong
Date: May 2020Reference: Q188-D02

Flight Ecology
Ecological Training and Consultancy
32 Firs Road, Milnthorpe Cumbria, LA7 7QF
www.flightecology.co.uk

CONTENTS

SUMMARY

Flight Ecology were commissioned to undertake a red squirrel presence or likely absence survey of the area of woodland at High Close, near Parsonby, Cumbria. It is proposed to excavate an open quarry in the fields at High Close. This will involve the removal of an area of trees from the existing shelter-belt woodland which borders the western edge of the site.

Potential for red squirrels has been established and therefore an investigation was proposed to establish the presence of squirrels on site.

Three walkover surveys were undertaken to search for evidence of squirrels, in particular dreys (squirrel nests).

Two motion activated trail cameras were also deployed alongside baited squirrel feeders in an attempt to capture footage of feeding squirrels.

During the surveys, no squirrels were observed and no evidence of squirrels was found, either red or grey.

It is therefore concluded that the site does not support a population of squirrels, either grey or red. There are therefore no restrictions to the proposed development on the grounds of squirrel conservation and no recommendations for further survey work or mitigation.

INTRODUCTION

Background

1.1. Flight Ecology were commissioned to undertake a red squirrel presence or likely absence survey of the area of woodland at High Close, near Parsonby, Cumbria.

1.2. It is proposed to excavate an open quarry in the fields at High Close. This will involve the removal of an area of trees from the existing shelter-belt woodland which borders the western edge of the site.

1.3. An Extended Phase 1 Habitat Assessment was carried out by Rigby Jerram Ecological Consultants in August 2016. Further ecological surveys have been carried out including a Ground Level Tree Assessment (for bats) by SK Environmental Solutions Ltd in January 2018 and an Aerial Tree Inspection (for bats) in February 2018 and an update Aerial Tree Inspection (for bats) in February and March 2020. SK Environmental Solutions Ltd also carried out a Bat Transect Survey during the summer of 2018, which included the belt of woodland.

1.4. During these surveys, potential for squirrels was identified but no definitive presence or absence was established.

Survey Objectives

1.5. The purpose of the survey was therefore to:

- Inspect the woodland for squirrels and/or evidence of squirrels;
- Identify any squirrel dreys (nests) that may be present on site;
- If squirrels are present, determine which species of squirrel are present, red or grey; and
- Provide recommendations regarding any potential impacts to squirrels and squirrel habitat.

1.6. The instructed works comprised three inspection visits and a program of static monitoring, using baited camera traps.

Site Description

1.7. The proposed development site comprises an area of rural grazing land to the south of the small village of Parsonby, near Cockermouth in north Cumbria. There is a small farm (High Close Farm) just beyond the north-eastern corner of the development site.

1.8. The western edge of the boundary consists of a shelter-belt of woodland, approximately 75m wide by 520m long; this woodland is the focus of this survey. To the west of this woodland, just outside the site boundary, runs the B5301 road, which follows a generally north-south orientation alongside the site. Consultation of archive maps suggests that woodland has been present within the existing location since at least 1866.

1.9. Within the remainder of the site, the field boundaries comprise fragmented native hedgerows which has been replaced in numerous places with post-and-wire fences. There are no significanttrees within the hedgerows. However, a small number of more mature trees are located within the most northerly site boundary. There is also another pocket of woodland in the north-eastern corner of the development site, alongside the farm. Other woodland can be found approximately 450m to the west of the study area, approximately 600m to the south-west and a tree-lined watercourse approximately 1.4km to the east of the study area.

Figure 1: Aerial plan of proposed development site (red line boundary), initial excavation area(yellow line boundary) and woodland (blue line boundary)

METHODOLOGY

Squirrel Drey/Evidence Search

1.9. Locating squirrel dreys (nests) is a reliable way to establish the presence of squirrels in an area. Although it is difficult to distinguish between red and grey squirrel dreys, a drey search forms a useful preliminary method to establish the presence or likely absence of either species in an area. Dreys tend to be semi-permanent when squirrels are resident, and thus the number of dreys tends to reflect squirrel numbers over a season, a year or even longer.

1.10. A transect through the woodland was slowly walked by the surveyor, who made note of all potential squirrel dreys. The transect followed a 'back-and-forth' pattern along the length of the woodland, so that all trees could be viewed from varying angles, in order to minimise the possibility of missing a potential drey.

1.11. In addition, during the transect, observations were made of any squirrels seen and of any evidence found of squirrel activity, such as;

- Squirrels (live or dead);
- Feeding remains;
- Droppings; or
- Damage to vegetation caused by squirrels.

1.12. Where dreys were located, they were examined from the ground using binoculars and a high-powered torch, if necessary. A grid reference point was recorded for each drey and notes taken of the location, type of tree, height above ground and composition. Evidence was similarly noted with a grid refeence and details of the evidence type.

Baited Camera Trap Survey

1.13. In order to gain tangible evidence of squirrel presence, including the species of squirrel present, baited camera traps were used within the woodland.

1.14. Two purpose-built squirrel feeders were positioned in trees within the woodland and loaded with a squirrel feed mix, including sunflower seeds, hazel nuts, monkey nuts and loose peanuts. As the woodland is a long narrow belt of trees, the feeders were positioned in a relatively central location within the belt, avoiding the edges of the woodland in an attempt to minimise the possibility of enticing squirrels from outside of the woodland into it due to the available food.

1.15. Due to the evidence of teenage off-road cyclists in the northern end of the woodland, the feeders were positioned in the centre and the southern end of the belt of woodland, so as to avoid any interference.

1.16. Alongside each feeder was a motion activated camera trap. These cameras are able to record both video and still images 24 hours a day, including using infrared light to record in the dark. Therefore, if squirrels visited the feeders then the cameras would record evidence of their presence, irrespective of the time of day.

LEGISLATION AND PLANNING POLICY

1.17. The red squirrel is included in Schedules 5 and 6 of the Wildlife & Countryside Act 1981 (WCA) (The Wildlife & Countryside (Northern Ireland) Order 1985), which means that it is a protected species. This legislation has subsequently been amended, most recently by the Countryside & Rights of Way Act 2000 (CRoW) for England and Wales.

1.18. The inclusion of the species in Schedule 5 means that, under Section 9 of the WCA and Article 10 of the W(NI) Order it is an offence to:

- Intentionally kill, injure or take (capture) a red squirrel [S9(1)];
- Intentionally or recklessly damage or destroy any structure or place a red squirrel uses for shelter or protection or disturb a red squirrel while it is occupying such a place [S9(4)];
- Possess a dead or live wild red squirrel, or any part of a red squirrel, unless you can show that the animal was taken legally. [S9(2)]; or
- Sell, or offer for sale, a wild red squirrel or any part of a wild red squirrel.
- Under Section 11 of the Act, it is also illegal to:
- Set in place a trap, snare, electrical device for killing or stunning or any poisonous, poisoned or stupefying substance; use a decoy, gas or smoke, bows or cross-bows, explosives, automatic weapons or mechanically propelled vehicles which are of such a nature and so placed as to be calculated to cause bodily injury to a red squirrel.

1.19. Section 18 of the Act makes it clear that attempting to commit an offence is, legally, the same as committing the offence. There are defences in the Act that, in certain circumstances, permit actions that would otherwise be illegal. These include:

- The act was the incidental result of a lawful operation and could not reasonably have been avoided. This defence applies to killing or injuring squirrels or damaging or destroying their places of shelter or protection;
- The act took place within a dwelling-house. This defence only applies to damaging or destroying places used for shelter or protection. It could be used, for example, if red squirrels enter the roof of a house; or
- Injured or disabled animals may be taken and possessed solely for the purpose of looking after them and releasing them once they are no longer disabled; similarly, badly injured animals may legally be killed.

1.20. In addition to these defences, there is also a licensing system, which can permit activities that would otherwise be offences for certain purposes. Licences are issued by government departments (GD) or statutory nature conservation organisations (SNCO), depending on the purpose:

- Prevention of serious damage to livestock, crop or growing timber or any other form of property (GD);
- Prevention of the spread of disease and for public health and safety (GD);
- Science or education (SNCO);
- Preservation of zoological collections (SNCO); or
- Conservation (SNCO)

Limitations

1.21. The presence of an active bike track in the northern half of the wood, assumedly constructed by youths, prevented the positioning of a squirrel feeder and associated camera within this area, for fear of tampering or theft.

1.22. Following the first visit, Covid-19 restrictions came into place which limited the ability to visit the site. However, although visits were more spaced out, bait did not run out and the cameras recorded for the entire period.

RESULTS

Desk Study

1.23. Both red and grey squirrels are known to be active within Cumbria as a whole. Although red squirrels are now extinct in vast areas of England, certain areas of Cumbria retain healthy populations, despite the proximity of grey squirrel populations. This is predominantly due to the continued efforts to reduce the grey population through lethal means. Where grey squirrel control is not practiced, they become established, often leading to a reduction in red squirrel numbers.

1.24. Within records obtained from the Cumbria Biodiversity Data Centre, there is just one record of a red squirrel within a 2km radius of the site. This record is from a location approximately 1km to the east of the proposed quarry, and at least 1.3km from the woodland. The record is from 2001, 19 years prior to the survey, and appears to be from a location along a wooded watercourse which follows a generally north-south orientation. There is little woodland connectivity between the survey site and this record location.

1.25. There are no records of grey squirrels within the data received from CBDC.

Squirrel Drey/Evidence Search

1.26. Walkover surveys were carried out on the 24th February, 18th March and 1st May 2020 to inspect the trees for squirrel dreys. A transect was walked through the woodland from the ground. The transect followed a 'back-and-forth' pattern along the length of the woodland, so that all trees could be viewed from varying angles, in order to minimise the possibility of missing a potential drey.

1.27. During the surveys, no squirrel dreys were found and no squirrels or squirrel evidence was found.

Baited Camera Trap Survey

1.28. Food stations, with associated camera traps, were positioned on the 24th February and were well stocked with a squirrel-specific food mix. Some of the mix was also scattered on the floor around the baited tree, to attract squirrels to the bait station.

1.29. The feed was topped up on the 18th March and the cameras downloaded and batteries replaced. The feeders and cameras were then collected in on the 1st May 2020 and removed from site.

1.30. The bait stations were in place for 67 days, with cameras recording the whole time. During the first period (between 24th Feb and 18th March) cameras were placed on video mode. For the remaining period the cameras recorded still images only (in order to save memory space).

1.31. The cameras recorded no squirrels during the period of monitoring. The bait stations were visited by numerous birds, including nuthatches and great spotted woodpeckers, as well as wood mice. However, no squirrels or other mammals were observed utilising them.

1.32. When deployed, the lids of the bait stations were propped open with monkey-nuts, so as to allow the smell of the bait to permeate der. Once these nuts were dislodged and the lids closed, the bait stations were less visited, as the birds were not able to push the lid open.

1.33. The station is specifically designed in this way to provide access for larger mammals like squirrels but restrict access to birds. Once the lid closed, food ceased being consumed and stations were generally found half-full. Therefore, there is no likelihood that squirrels may have been visiting the stations to remove food but somehow not triggering the cameras.

CONCLUSIONS

1.34. On the basis of the survey work carried out, there is no evidence that squirrels are present within the survey site.

1.35. Very few records exist of red squirrels in the locality, none from the site itself. During the observation surveys, no squirrels or evidence of squirrels was found and during the bait station surveys, no photos or videos of squirrels were obtained.

1.36. The woodland is relatively small, comprising a relatively short belt of trees alongside the adjacent road. It would therefore only be suitable for a very low number of squirrels. There is little connectivity between the trees within this woodland and any other woodland. Although the surrounding landscape has small patches of woodland, there is no significant coverage of woodland that could sustain a significant feeder population of squirrels to support a remnant within the survey site.

1.37. It is therefore concluded that the site does not support a population of squirrels, either grey or red. There are therefore no restrictions to the proposed development on the grounds of squirrel conservation and no recommendations for further survey work or mitigation.

REFERENCES

Countryside and Rights of Way Act 2000(c. 37). The Stationery Office, London.

Friends of the Red Squirrel. Squirrel Information Pack. Red Alert North England Project.

Gurnell, J., Lurz, P., Macdonald, R. and Pepper, H. (2009). Practical techniques for surveying andmonitoring squirrels. Forestry Commission Practice Note. Forestry Commission, Edinburgh.

JNCC: Advice Note – Red Squirrels and the Law. UK Red Squirrel Group, August 2004. http://www.jncc.gov.uk/PDF/rs_law_ewn.pdf JNCC (1994) UK Biodiversity Action Plan.

Planning Act 2008(c. 29). The Stationery Office, London.

Rodriguez, A. and Andren, H. (1999). A comparison of Eurasian red squirrel distribution in differentfragmented landscapes. Journal of Applied Ecology 36(5): 649–662.

Wildlife and Countryside Act 1981(WCA) (c. 69). Her Majesty's Stationery Office, London.

PHOTOGRAPHS

Photograph 1: Squirrel feeder

Photograph 2: Trail camera

Photograph 3: Nuthatch on feeder

Photograph 4: Great tit on feeder

Photograph 5: Great spotted woodpecker onfeeder

Photograph 6: Wood mice on feeder

APPENDIX 4: NOISE

Noise Assessment

Proposed Mineral Extraction Operations at High Close Quarry, Parsonby, Cumbria

THOMAS ARMSTRONG LTD

R23.9447/9/AP
Date of Report: 26 January 2023

REPORT DETAILS

Client	Thomas Armstrong Ltd
Report Title	Noise Assessment – Proposed Mineral Extraction Operations
Site Address	High Close Quarry, Parsonby, Cumbria
Report No.	R23.9447/9/AP
Vibrock Contact	vibrock@vibrock.com

QUALITY ASSURANCE

Issue No.	Issue Date	Author	Technical Review
8	24/03/21	A Pickford MIOA Director	A Findlay MIOA Senior Consultant
9	26/01/23	A Pickford MIOA Director	R Kennedy MIOA Director

This report has been prepared by Vibrock the trading name of Vibrock Limited, with all reasonable skill, care and diligence within the terms of the Contract with the client, incorporating our General Terms and Conditions of Business and taking account of the resources devoted to it by agreement with the client.

We disclaim any responsibility to the client and others in respect of any matters outside the scope of the above.

This report is confidential to the client and we accept no responsibility of whatsoever nature to third parties to whom this report, or any part thereof, is made known. Any such party relies on the report at their own risk.

Vibrock Limited
Shanakiel
Ilkeston Road, Heanor
Derbyshire, DE75 7DR
Tel: +44 (0) 1773 711211
Fax: +44 (0) 1773 711311
Email: vibrock@vibrock.com
Web: www.vibrock.com

COMPETENCY AND EXPERTISE

The Company

Vibrock Ltd is an established independent environmental consultancy who has been providing noise, dust and vibration consultancy services to industry since 1991. Vibrock Ltd is a member of the Association of Noise Consultants and its consultants are Associate or Corporate Members of the Institute of Acoustics.

The Authors

Andrew Pickford BSc, MSc, PGDip, MIOA has undertaken responsible work in noise impact assessment and acoustics since 2006. He has experience in working for large multi-disciplinary organisations as well as smaller technical consultancies. Andrew specialises in the measurement and assessment of environmental noise for a wide range of applications within the industrial, commercial, residential, waste disposal and mineral extraction sectors. In addition to a diploma in Acoustics and Noise Control, he holds an MSc in Environmental Management and is a full Member of the Institute of Acoustics. Andrew has been involved in the assessment of noise for planning applications and EIA development relating to mineral sites across Derbyshire, Leicestershire, Staffordshire, Oxfordshire, Cheshire, Lincolnshire, Nottinghamshire, Outer London, Yorkshire, Lancashire, Durham, Shropshire, Hampshire, Warwickshire, Northamptonshire, Worcestershire, Northumberland, Cumbria, Vale of Glamorgan, Gwynedd, Powys, Carmarthenshire, Flintshire, Jersey and Somerset.

Allan Findlay CEng MICE, MIQ, MIOA has been involved with surface mineral projects for over thirty years in a variety of roles, including site supervision, project design and consultancy. His qualifications and experience provide him with the background necessary to undertake detailed assessments of noise, air quality and vibration for a variety of projects. He is a Chartered Engineer, Member of the Institution of Civil Engineers, Member of the Institute of Quarrying and Member of the Institute of Acoustics.

Richard Kennedy B.Eng PGDip MIOA has over 15 years environmental consultancy experience. Richard has been involved in the preparation of a wide range of environmental noise, dust and vibration assessments for major civil engineering projects, large manufacturing and processing industries and mineral extraction developments. In addition to a diploma in Acoustics and Noise Control, Richard is a Member of the Institute of Acoustics.

NON-TECHNICAL SUMMARY

1. Thomas Armstrong Limited are seeking planning permission for a proposed scheme of mineral extraction at High Close Quarry. Vibrock Limited have been commissioned to conduct a noise impact assessment of the proposals.

2. Existing sound levels have been measured at locations chosen to represent noise-sensitive premises in the vicinity of the site and this information has been used to establish the baseline conditions.

3. Predicted noise levels from the proposed operations have been calculated at nearby noise-sensitive premises. These predictions are based on detailed information regarding the proposed working of the site and have been undertaken following calculation methods that are suitable for open sites such as quarries.

4. The development has been assessed with reference to policy and guidance specifically relating to noise emissions from mineral sites and other guidance where appropriate.

5. The outcome of the assessment demonstrates that the proposed scheme is able to operate in accordance with these noise standards and there are not considered to be any significant or unacceptable adverse impacts. A range of recommendations have been made to minimise potential noise emissions from the site during the implementation of the proposed scheme.

CONTENTS

FIGURE

APPENDICES

1.0 INTRODUCTION

1.1 Overview

1.1.1 Vibrock Limited were commissioned to undertake a noise assessment to accompany a planning application for a proposed scheme of mineral extraction at High Close Quarry.

1.1.2 This study benefits from site inspections and baseline sound level monitoring undertaken in April 2017, December 2019 and October 2022. The purpose of these surveys was to establish the background sound levels currently experienced at noise-sensitive premises within the vicinity of the site.

1.1.3 An assessment of the potential impact of the proposals at the identified noise-sensitive premises has been made by comparison of predicted quarry noise levels with relevant guidance and criteria. Where necessary suitable mitigation measures have been recommended.

1.1.4 Further explanation of the acoustic terminology used within this report is provided in Appendix 5.

1.2 Context

1.2.1 This update to the noise impact assessment report has been produced as part of the resubmission of the Environmental Statement to provide all the further information which has been requested by Cumbria County Council under the Regulation 22 Schedule of Further Information Requirements (June 2020) procedure. The potential site noise emission levels presented take into consideration the changes made to the indicative quarry development plans during this process.

1.2.2 The initial Vibrock report dated 2 August 2019 was submitted as an Appendix to the Environmental Statement in August 2019. A subsequent report dated 2 June 2020 was produced following receipt of consultation responses from Allerdale Borough Council Environmental Health Department dated 1 November 2019, Plumbland Parish Council Technical Memorandum dated 7 November 2019 and a Public Meeting held on 19 October 2019.

1.2.3 There was concern at the public meeting that the noise assessment had not specifically surveyed the baseline ambient noise climate at Plumbland School. To address this, a background noise survey was carried out in December 2019. A subsequent assessment of noise impact on the school was incorporated into the assessment.

1.2.4 The correspondence received from Allerdale Borough Council Environmental Health Department in November 2019 is presented in Appendix 4 and also includes a letter dated 14 July 2020 confirming that the noise assessment of June 2020 satisfies the requirements of the comments in Richard Cain's email of 1 November 2019.

1.2.5 In March 2021 a revised Noise Assessment Report ref. R21.9447/8/AP was prepared to address the EHO response and provide all the further information requested in the Regulation 22 Schedule. This report formed part of the draft resubmission ES which was sent to Plumbland Parish Council for comment as part of an agreed community engagement process. In addition the application team met with PPC representatives on 29 June 2022.

1.2.6 Following the Parish Council's review of the draft resubmission documents and the above meeting there was concern that the noise assessment was based on assumptions made on a generic plant complement rather than a specific plant complement. Comment was also made in relation to the quantity of data collected during the baseline noise survey.

1.2.7 This version of the report addresses all comments and further information requests received previously but also provides updated noise emission calculations based on specific plant details and presents the results of additional baseline noise monitoring undertaken in October 2022.

1.3 High Close Farm

1.3.1 High Close Farm is the closest residential premises to mineral operations associated with the proposed scheme.

1.3.2 Thomas Armstrong Limited former owners of High Close Farm have sold the property, together with some land to the north of the proposed development to a local person. The new owner intends to run an existing agricultural shed building company from the property and there will be storage of diggers with a small amount of fabrication.

1.3.3 The new owner was fully aware of the proposal to quarry and implement the dormant planning permission, but was keen to buy the property. The proposal has been in the public arena following the formal request to Cumbria County Council for a Scoping Opinion in April 2017.

1.3.4 As part of the sale and purchase agreement the new owner, being completely aware of the proposal, has formally and legally agreed that he will not object to the proposed application or to the ongoing operations. Also this covenant will apply to future owners.

1.3.5 In earlier iterations of the noise impact assessment report High Close Farm was not included as a sensitive location due to it being in the ownership of Thomas Armstrong Limited who at the time controlled the occupation of the residential dwelling at the farm. Notwithstanding the legal agreement, the sale and purchase of the farm has identified the need for the potential environmental noise impacts at High Close Farm to be fully assessed. Background noise monitoring was undertaken at High Close Farm in October 2022 to quantify the existing acoustic environment at this additional assessment location. Noise generating commercial activities at High Close Farm (outlined in section 1.3.2 above) which have the potential to increase the background noise levels were not taking place during the monitoring.

2.0 NOISE POLICY AND GUIDANCE

2.1 National Planning Policy and Guidance

Noise Policy Statement for England (NPSE)

2.1.1 The NPSE sets out the Government's policy on noise and includes the long term vision of promoting good health and a good quality of life through the effective management of noise within the context of Government policy on sustainable development.

2.1.2 This long term vision is supported by the following aims:

Through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development:

- avoid significant adverse impacts on health and quality of life;
- mitigate and minimise adverse impacts on health and quality of life; and
- where possible, contribute to the improvement of health and quality of life.

2.1.3 There are two established concepts from toxicology that are currently being applied to noise impacts, for example, by the World Health Organisation. They are:

- NOEL (No Observed Effect Level) – this is the level below which no effect can be detected. In simple terms, below this level, there is no detectable effect on health and quality of life due to the noise;
- LOAEL (Lowest Observed Adverse Effect Level) – this is the level above which adverse effects on health and quality of life can be detected.

2.1.4 Extending these concepts further, NPSE leads to the concept of a significant observed adverse effect level:

- SOAEL (Significant Observed Adverse Effect Level) – this is the level above which significant adverse effects on health and quality of life occur.

2.1.5 NPSE acknowledges that it is not possible to have a single objective noise-based measure that defines NOEL, LOAEL and SOAEL that is applicable to all sources of noise in all situations. It is therefore suggested that more specific advice from other applicable noise standards and guidance could be employed to determine suitable noise level criteria within the overall principles of the NPSE.

National Planning Policy Framework (NPPF)

2.1.6 The revised NPPF was updated on 20 July 2021 and sets out the government's planning policies for England and how these are expected to be applied. This document replaces the first NPPF published in March 2012, and includes minor clarifications to the revised versions published in July 2018, February 2019 and June 2019.

2.1.7 Where issues of noise impact are concerned the NPPF provides brief guidance in Chapter 15 '*Conserving and enhancing the natural environment*' as follows:

Paragraph 174:

Planning policies and decisions should contribute to and enhance the natural and local environment by preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability.

Paragraph 185:

Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should:

a) mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life;

b) identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason; and

c) limit the impact of light pollution from artificial light on local amenity, intrinsically dark landscapes and nature conservation.

Paragraph 187:

Planning policies and decisions should ensure that new development can be integrated effectively with existing businesses and community facilities (such as places of worship, pubs, music venues and sports clubs). Existing businesses and facilities should not have unreasonable restrictions placed on them as a result of development permitted after they were established. Where the operation of an existing business or community facility could have a significant adverse effect on new development (including changes of use) in its vicinity, the applicant (or 'agent of change') should be required to provide suitable mitigation before the development has been completed.

2.1.8 Specifically in relation to mineral sites, the NPPF provides guidance in Chapter 17 '*Facilitating the sustainable use of minerals*' as follows:

Paragraph 209:

It is essential that there is a sufficient supply of minerals to provide the infrastructure, buildings, energy and goods that the country needs. Since minerals are a finite natural resource, and can only be worked where they are found, best use needs to be made of them to secure their long-term conservation.

Paragraph 210:

Planning policies should:

a) provide for the extraction of mineral resources of local and national importance, but not identify new sites or extensions to existing sites for peat extraction;

b) so far as practicable, take account of the contribution that substitute or secondary and recycled materials and minerals waste would make to the supply of materials, before considering extraction of primary materials, whilst aiming to source minerals supplies indigenously;

c) safeguard mineral resources by defining Mineral Safeguarding Areas; and adopt appropriate policies so that known locations of specific minerals resources of local and national importance are not sterilised by non-mineral development where this should be avoided (whilst not creating a presumption that the resources defined will be worked);

d) set out policies to encourage the prior extraction of minerals, where practical and environmentally feasible, if it is necessary for non-mineral development to take place;

e) safeguard existing, planned and potential sites for: the bulk transport, handling and processing of minerals; the manufacture of concrete and concrete products; and the handling, processing and distribution of substitute, recycled and secondary aggregate material;

f) set out criteria or requirements to ensure that permitted and proposed operations do not have unacceptable adverse impacts on the natural and historic environment or human health, taking into account the cumulative effects of multiple impacts from individual sites and/or a number of sites in a locality;

g) when developing noise limits, recognise that some noisy short-term activities, which may otherwise be regarded as unacceptable, are unavoidable to facilitate minerals extraction; and

h) ensure that worked land is reclaimed at the earliest opportunity, taking account of aviation safety, and that high quality restoration and aftercare of mineral sites takes place.

Paragraph 211:

When determining planning applications, great weight should be given to the benefits of mineral extraction, including to the economy. In considering proposals for mineral extraction, minerals planning authorities should:

a) as far as is practical, provide for the maintenance of landbanks of non-energy minerals from outside National Parks, the Broads, Areas of Outstanding Natural Beauty and World Heritage Sites, scheduled monuments and conservation areas;

b) ensure that there are no unacceptable adverse impacts on the natural and historic environment, human health or aviation safety, and take into account the cumulative effect of multiple impacts from individual sites and/or from a number of sites in a locality;

c) ensure that any unavoidable noise, dust and particle emissions and any blasting vibrations are controlled, mitigated or removed at source, and establish appropriate noise limits for extraction in proximity to noise sensitive properties;

d) not grant planning permission for peat extraction from new or extended sites;

e) provide for restoration and aftercare at the earliest opportunity, to be carried out to high environmental standards, through the application of appropriate conditions. Bonds or other financial guarantees to underpin planning conditions should only be sought in exceptional circumstances;

f) consider how to meet any demand for small-scale extraction of building stone at, or close to, relic quarries needed for the repair of heritage assets, taking account of the need to protect designated sites; and

g) recognise the small-scale nature and impact of building and roofing stone quarries, and the need for a flexible approach to the duration of planning permissions reflecting the intermittent or low rate of working at many sites.

Paragraph 212:

Local planning authorities should not normally permit other development proposals in Mineral Safeguarding Areas if it might constrain potential future use for mineral working.

Planning Practice Guidance (PPG)

2.1.9 PPG is written in support of the NPPF and provides an increased level of specific planning guidance.

2.1.10 PPG-Noise states that noise needs to be considered when new development may create additional noise or would be sensitive to the prevailing acoustic environment (including any anticipated changes to that environment from activities that are permitted but not yet commenced). Where justified, noise can override other planning concerns, although it is important to look at noise in the context of the wider characteristics of a development proposal, its likely users and its surroundings, as these can have an important effect on whether noise is likely to pose a concern.

2.1.11 Plan-making and decision taking need to take account of the acoustic environment and in doing so consider:

- whether or not a significant adverse effect is occurring or likely to occur;
- whether or not an adverse effect is occurring or likely to occur;

  and
- whether or not a good standard of amenity can be achieved.

2.1.12 In line with the Explanatory note of the NPSE this would include identifying whether the overall effect of the noise exposure would be above or below the significant observed adverse effect level (SOAEL) and the lowest observed adverse effect level (LOAEL) for the given situation.

2.1.13 When noise is not perceived to be present, there is by definition no effect. As the noise exposure increases, it will cross the 'No Observed Effect Level'. However, the noise has no adverse effect so long as the exposure does not cause any change in behaviour, attitude or other physiological responses of those affected by it.

2.1.14 As the exposure increases further, it crosses the LOAEL boundary above which the noise starts to cause small changes in behaviour and attitude and consideration needs to be given to mitigating and minimising those effects (taking account of the economic and social benefits being derived from the activity causing the noise).

2.1.15 Increasing noise exposure will at some point cause the SOAEL boundary to be crossed. Above this level the noise causes a material change in behaviour. If the exposure is predicted to be above this level the planning process should be used to avoid, but not necessarily prevent, this effect occurring, for example through use of appropriate mitigation such as by altering the design and layout.

2.1.16 The table below summarises the noise exposure hierarchy from PPG-Noise.

Response	**Examples of outcomes**	**Increasing effect level**	**Action**
	No Observed Effect Level		
Not present	No Effect	No Observed Effect	No specific measures required
	No Observed Adverse Effect Level		
Present and not intrusive	Noise can be heard, but does not cause any change in behaviour, attitude or other physiological response. Can slightly affect the acoustic character of the area but not such that there is a change in the quality of life.	No Observed Adverse Effect	No specific measures required
	Lowest Observed Adverse Effect Level		
Present and intrusive	Noise can be heard and causes small changes in behaviour, attitude or other physiological response, e.g. turning up volume of television; speaking more loudly; where there is no alternative ventilation, having to close windows for some of the time because of the noise. Potential for some reported sleep disturbance. Affects the acoustic character of the area such that there is a small actual or perceived change in the quality of life.	Observed Adverse Effect	Mitigate and reduce to a minimum
	Significant Observed Adverse Effect Level		
Present and disruptive	The noise causes a material change in behaviour, attitude or other physiological response, e.g. avoiding certain activities during periods of intrusion; where there is no alternative ventilation, having to keep windows closed most of the time because of the noise. Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in acoustic character of the area.	Significant Observed Adverse Effect	Avoid
Present and very disruptive	Extensive and regular changes in behaviour, attitude or other physiological response and/or an inability to mitigate effect of noise leading to psychological stress, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory.	Unacceptable Adverse Effect	Prevent

2.1.17 In relation to noise from mineral extraction operations, PPG-Noise makes reference to National Planning Practice Guidance for minerals which is outlined overleaf.

2.1.18 The supporting 'Minerals' PPG is the current Government advice applicable to the control of noise from surface mineral workings in England and recognises that planning for the supply of minerals has a number of special characteristics that are not present in other development.

2.1.19 It includes the following appropriate noise standards for 'normal operations';

"Mineral planning authorities should aim to establish a noise limit, through a planning condition, at the noise-sensitive property that does not exceed the background noise level ($L_{A90,1h}$) by more than 10dB(A) during normal working hours (0700-1900). Where it will be difficult not to exceed the background level by more than 10dB(A) without imposing unreasonable burdens on the mineral operator, the limit set should be as near that level as practicable. In any event, the total noise from the operations should not exceed 55dB(A) $L_{Aeq,1h}$ (free field). For operations during the evening (1900-2200) the noise limits should not exceed the background noise level ($L_{A90,1h}$) by more than 10dB(A) and should not exceed 55dB(A) $L_{Aeq,1h}$ (free field). For any operations during the period 2200 – 0700 noise limits should be set to reduce to a minimum any adverse impacts, without imposing unreasonable burdens on the mineral operator. In any event the noise limit should not exceed 42dB(A) $L_{Aeq,1h}$ (free field) at a noise sensitive property.

Where the site noise has a significant tonal element, it may be appropriate to set specific limits to control this aspect. Peak or impulsive noise, which may include some reversing bleepers, may also require separate limits that are independent of background noise (e.g. Lmax in specific octave or third-octave frequency bands – and that should not be allowed to occur regularly at night.)

Care should be taken, however, to avoid any of these suggested values being implemented as fixed thresholds as specific circumstances may justify some small variation being allowed."

2.1.20 The same document includes instances where particularly noisy short-term activities may occur and the appropriate criteria for such circumstances;

"Activities such as soil-stripping, the construction and removal of baffle mounds, soil storage mounds and spoil heaps, construction of new permanent landforms and aspects of site road construction and maintenance.

Increased temporary daytime noise limits of up to 70dB(A) $L_{Aeq,1h}$ (free field) for periods of up to eight weeks in a year at specified noise-sensitive properties should be considered to facilitate essential site preparation and restoration work and construction of baffle mounds where it is clear that this will bring longer-term environmental benefits to the site or its environs.

Where work is likely to take longer than eight weeks, a lower limit over a longer period should be considered. In some wholly exceptional cases, where there is no viable alternative, a higher limit for a very limited period may be appropriate in order to attain the environmental benefits. Within this framework, the 70 dB(A) $L_{Aeq,1h}$ (free field) limit referred to above should be regarded as the normal maximum".

2.1.21 The suitability of each proposed mineral site, whether an extension to an existing site or a new site, must be considered on its individual merits but thought should also be given to the cumulative impact of proposals in an area.

2.1.22 Some parts of a mineral planning authority area may have been subjected to successive mineral development over a number of years. Mineral planning authorities should include appropriate policies in their minerals local plan, where appropriate, to ensure that the cumulative impact of a proposed mineral development on the community and the environment will be acceptable.

2.1.23 The cumulative impact of mineral development is also capable of being a material consideration when determining individual planning applications.

2.2 Local Planning Policy

Cumbria Minerals and Waste Local Plan 2015 – 2030

2.2.1 The Plan sets out the Council's vision and strategy for waste management and minerals development within Cumbria outside the two National Parks.

2.2.2 Relevant policies include Development Control Policy DC3 Noise which is reflective of the national guidance provided within PPG-Minerals.

Allerdale Local Plan

2.2.3 The Allerdale Local Plan contains the Council’s planning policies for the use and development of land up to 2029.

2.2.4 In terms of noise, strategic policy S32 Safeguarding Amenity states that proposals will not be supported where they would:

a. Result in pollution or hazards which prejudice the health and safety of communities and their environments, including nature conservation interests and the water environment which cannot be overcome by appropriate mitigation measures;

b. Result in a detrimental effect on the local area in terms of visual amenity, distinctive character or environmental quality;

c. Generate severe highway infrastructure or network problems in relation to access, road safety, traffic flow or car parking.

2.3 Other Technical Guidance

WHO Guidelines for Community Noise 1999

2.3.1 This guidance aims to provide environmental health authorities and professionals with guidance on the adverse health effects of community noise on people.

2.3.2 Community noise (also called environmental noise, residential noise or domestic noise) is defined as noise emitted from all sources, except noise at the industrial workplace. Main sources of community noise include road, rail and air traffic, industries, construction and public work, and the neighbourhood.

2.3.3 This document presents a summary of research and opinions on the impacts of noise and recommends guideline values for avoidance of particular effects e.g. annoyance and sleep disturbance. It is the primary reference point for other guidance value based documents, such as BS 8233.

2.3.4 The following guideline values have been derived according to specific environments. The values relevant to this assessment are shown in the table below.

Specific Environment	**Critical Health Effect(s)**	**L_{Aeq} (dB)**	**$L_{Amax,fast}$ (dB)**	**Time base (hrs)**
Daytime				
Outdoor living area	Serious annoyance, daytime and evening Moderate annoyance, daytime and evening	55 50		16 16
School, playground outdoor	Annoyance	55		During play
Night-time				
Outside Bedrooms	Sleep disturbance, window open (outdoor values)	45	60	8

2.3.5 Guideline values for annoyance have been set at 50 or 55 dB $L_{Aeq,16h}$ representing daytime levels below which a majority of the adult population will be protected from becoming moderately or seriously annoyed, respectively. For outdoor playgrounds the sound level of the noise from external sources should not exceed 55 dB L_{Aeq}, the same value given for outdoor residential areas during the daytime.

2.3.6 At night, sound pressure levels at the outside façades of the living spaces should not exceed 45 dB L_{Aeq} and 60 dB L_{Amax}, so that people may sleep with bedroom windows open.

WHO Environmental Noise Guidelines for the European Region 2018

2.3.7 These guidelines for the European Region provide guidance on protecting human health from harmful exposure to environmental noise. They set health-based recommendations on average environmental noise exposure of five relevant sources of environmental noise. These sources are: road traffic noise, railway noise, aircraft noise, wind turbine noise and leisure noise but do not include noise from mineral sites.

BS 8233:2014 Guidance on sound insulation and noise reduction for buildings

2.3.8 This Standard provides guidance for the control of noise in and around buildings and is applicable to the design of new buildings, or refurbished buildings undergoing a change of use, but does not provide guidance on assessing the effects of changes in the external noise levels to occupants of an existing building.

BS 4142:2014+A1:2019 Methods for rating and assessing industrial and commercial sound

2.3.9 This British Standard describes methods for rating and assessing sound of an industrial and/or commercial nature. The standard is not intended to be applied to the rating and assessment of sound from other sources falling within the scopes of other standards or guidance such as mineral sites, construction sites and wind farms.

3.0 BASELINE CONDITIONS

3.1 Survey Details

3.1.1 Baseline sound levels were measured on Wednesday 19 April 2017 to characterise the typical daytime background noise levels experienced at noise-sensitive premises in the vicinity of the application site. Additional background noise measurements were made on Monday 16 December 2019 to characterise the acoustic environment in the vicinity of Plumbland C of E Primary School. Further background noise monitoring was undertaken at all assessment locations on 11 October 2022.

3.1.2 Measurements were made at locations selected to represent existing noise-sensitive premises closest to the proposed operations. The assessment locations used for the purpose of this study are shown in Figure 1. All measurements were undertaken with reference to the guidance presented within BS 7445.

3.2 Instrumentation

3.2.1 The following instrumentation was used during the survey:

Manufacturer	Type	Serial No.
Cirrus	Class 1 Integrating Sound Level Meter CR:811C	D21902FD
Cirrus	Class 1 Integrating Sound Level Meter CR:831B	C18229FF
Cirrus	Class 1 Integrating Sound Level Meter CR:811C	B14769FF
Cirrus	Class 1 Integrating Sound Level Meter CR:811C	D21904FD
Cirrus	Class 1 Integrating Sound Level Meter CR:1710	G078470
Cirrus	Class 1 Integrating Sound Level Meter CR:171B	G056448
Cirrus	Acoustic Calibrator CR:515	78061
Cirrus	Acoustic Calibrator CR:515	78059

3.2.2 During all measurements the microphones were protected with outdoor windshields. Measurements at all monitoring locations were ‘free field’ (no vertical reflective surfaces within 3.5 metres of the microphone) and at a height of between 1.2 – 1.5 metres above ground level.

3.2.3 The following set-up parameters were used on the sound level meters:

- Time Weighting: Fast
- Frequency Weighting: A
- Averaging-Integrating Period: 15 min
- Data Logging: Repeat (Contiguous)

3.2.5 With the equipment set up in the configuration used during measurement, field calibration checks were performed on site immediately before and after the survey period using a sound calibrator. No significant drift (i.e. no greater than ±0.5 dB) in the calibration value was observed between the initial and final checks.

3.3 Observations

3.3.1 The acoustic environment in the vicinity of the site comprised sound from distant road traffic using the A596 and B5301, intermittent road vehicles on other local links, agricultural activity, livestock, leaf rustle, and birdsong.

3.3.2 Weather conditions during the 2017 survey were dry and settled with average wind speeds of approximately 2 – 3 ms^{-1} predominantly from a west south-westerly direction. Cloud cover was in the region of 6 – 8 oktas and temperatures ranged from 9 – 11°C.

3.3.3 Weather conditions during the 2019 monitoring were dry and settled with average wind speeds of approximately 3 ms^{-1} predominantly from a south-south-westerly direction. Cloud cover was in the region of 6 oktas and temperatures ranged from 4 – 5°C.

3.3.4 Weather conditions during the 2022 monitoring were dry and settled with average wind speeds of approximately 1 – 2 ms^{-1} predominantly from a south-westerly direction. Cloud cover was in the region of 7 – 8 oktas, relative humidity of approximately 75% with a temperature of 9°C.

3.4 Results

3.4.1 The raw data collected during the survey is presented in Appendix 1 and the results are summarised below.

Assessment Location	Typical Background Noise Level L_{A90} dB
Eweclose	38
Parsonby Farm	39
The Muslins	38
Adam’s Ghyll	38
High Close Farm	37
Plumbland C of E Primary School	39

4.0 POTENTIAL NOISE EMISSIONS

4.1 Introduction

4.1.1 The level of sound in the local environs that arises from a site will depend on a number of factors. The more significant of which are:

(a) the sound level output of the plant or equipment used on site;

(b) the periods of operation of the plant on site;

(c) the distance between the source noise and the receiving position;

(d) the presence of screening due to barriers;

(e) the reflection of sound;

(f) soft ground attenuation.

4.1.2 Potential noise levels from the proposed scheme have been predicted at nearby noise-sensitive locations based on the following methodology and assumptions.

4.2 Prediction Methodology

4.2.1 The prediction method used is based upon that outlined within Annex F of BS 5228-1:2009+A1:2014 '*Code of practice for noise and vibration control on construction and open sites. Part 1: Noise*'. This guidance details methods to estimate noise from 'open sites' which can include quarries, waste disposal sites and long-term construction projects.

4.2.2 The most important elements of this standard used in the report are distance attenuation, site activity on-time, screening, ground absorption and angle of view corrections.

4.2.3 BS 5228 indicates that a barrier attenuation of 10 dB(A) can be used when the noise screen completely hides the source from the receiver and an attenuation of 5 dB(A) when the screen partially hides the source from the receiver. The standard also recognises that high topographical features, such as excavation voids and overburden mounds, can provide greater attenuation. In order to more accurately reflect the noise attenuation afforded to plant operating from within the quarry void, screening calculations have also been undertaken in accordance with Figure F.3 of BS 5228-1. This method allows for the attenuation of noise to be calculated by examining the path difference created by the topographical feature as well as the frequency of the sound.

4.2.4 For all noise prediction calculations, the ground absorption coefficient has been set to '1.0' representing soft ground. 'Soft' ground is taken to refer to surfaces which are absorbent to sound, e.g. grassland, cultivated land or plantations as opposed to 'hard' ground surfaces which reflect sound such as paved areas and rolled asphalt.

4.2.5 In accordance with 5228 methodology, the attenuation from screening and soft ground attenuation have not been combined (where applicable). Instead, either the attenuation from screening and hard ground propagation, or the attenuation provided by soft ground alone has been included in the calculation, whichever is the greater of the two.

4.2.6 All noise level predictions have been calculated with the combinations of plant working at the closest point to the assessment location. The predictions are therefore worst-case scenarios which may be of relatively short duration, however, they indicate the potential highest $L_{Aeq,1h}$ noise level to which a particular property or group of properties may be exposed during the working of the site. This worst case situation may occur intermittently over the lifetime of the site, but the longer-term noise levels perceived outside of the site boundary would normally be significantly less.

4.3 Noise Source Details

4.3.1 Information regarding the proposed scheme has been based on detailed quarry development plans, discussions with the applicant regarding the specific working methods to be employed and general observations made at other similar quarry sites. A list of plant sound power levels from which the noise predictions have been made are presented in Appendix 2 along with details regarding activity 'on-times' and vehicle movements.

4.3.2 The sound level data used to represent each proposed sound source has been taken from Vibrock's sound level measurement database which includes recent measurements of plant and activities at limestone quarries across the UK.

4.3.3 The applicant has confirmed the list of specific plant items detailed in Appendix 2 and has outlined the proposed working procedure as follows:

1. Limestone to be blasted by specialist contractor to the size we require (any oversize rock to be sold for rock armour or to be broken by hydraulic rock breaker).
2. 40-50 tonne tracked excavator to load the blasted limestone in to mobile primary impact crusher.
3. The primary crushed limestone will be fed directly into a secondary impact or/cone crusher with a +40mm re-circulation belt back into the impact or/cone.
4. The 40mm down limestone will be transferred by land conveyor to the material screening area and screened into 4 sizes (40mm/20mm/10mm/6mm down) (Phase 1 only)
5. Materials will be stockpiled here ready for collection by road vehicle (Phase 1 only)
6. When we have enough room in Phase 1 the screen will be repositioned and all crushing and screening will be carried out at the quarry face and material stockpiled here for collection by road vehicle.

4.4 Acoustic Screening

4.4.1 The location of vegetated soil screen bunds associated with the proposed scheme is shown in Figures 9 – 13 of the Environmental Statement (ES). Where appropriate, the noise level predictions take into account the beneficial attenuating effects of these features.

4.4.2 During Phase 1 the proposed stockpiling and processing area (shown on Figures 9 and 10 of the ES) will be screened by a vegetated soil storage mound. Once the quarry void has been established, all stockpiling and processing would be undertaken within the working void (Figures 11 – 13 of the ES).

5.0 ASSESSMENT

5.1 Introduction

5.1.1 Summaries of the predicted worst-case noise levels associated with the proposed scheme are shown in the tables below, together with a comparative assessment against relevant guidance.

5.2 Short-Term Operations

5.2.1 PPG permits a temporary daytime noise limit of 70 dB(A) $L_{Aeq,\ 1h}$ (free field) for periods of up to 8 weeks in a year to facilitate short-term activities which include essential site preparation, restoration, soil-stripping, the construction and removal of baffle mounds, soil storage mounds and spoil heaps, construction of new permanent landforms and aspects of site road construction and maintenance.

5.2.2 In terms of short-term operations, it is considered that soil stripping, overburden storage and bund formation are likely to have the highest noise impact due to their potential occurrence at or close to the site boundary and often unscreened from noise-sensitive premises. Hence, the table below presents an assessment of noise from these temporary activities associated with the proposed scheme for each phase of the development. Example calculations showing the worst-case noise levels at each receptors location are provided in Appendix 3.

Location	Phase	Predicted Worst Case Site Noise Level dB $L_{Aeq,1h}$ (free-field)	Criterion dB $L_{Aeq,1h}$ (free-field)	Difference Between Site Noise and 70 dB(A) Limit
Eweclose	1	45	70	-25
	2	44		-26
	3	44		-26
	4	44		-26
	5	44		-26
Parsonby Farm	1	48	70	-22
	2	45		-25
	3	44		-26
	4	42		-28
	5	40		-30
The Muslins	1	47	70	-23
	2	44		-26
	3	44		-26
	4	42		-28
	5	41		-29

Location	Phase	Predicted Worst Case Site Noise Level dB $L_{Aeq,1h}$ (free-field)	Criterion dB $L_{Aeq,1h}$ (free-field)	Difference Between Site Noise and 70 dB(A) Limit
Adam's Ghyll	1	48	70	-22
	2	45		-24
	3	44		-26
	4	42		-28
	5	42		-28
High Close Farm	1	57	70	-13
	2	53		-17
	3	53		-17
	4	49		-21
	5	50		-20
Plumbland Primary School	1	46	70	-24
	2	42		-28
	3	42		-28
	4	40		-30
	5	39		-30

5.2.3 The tables above demonstrate that potential noise levels from short-term activities are expected to remain within the recommended temporary limit of 70 dB.

5.3 Normal Operations

5.3.1 Subject to a maximum daytime (07:00 – 19:00) limit of 55 dB $L_{Aeq,\ 1h}$ (free field) for normal operations, PPG permits a noise limit at noise-sensitive property that does not exceed the background level by more than 10 dB(A). Where this poses an unreasonable burden on the mineral operator the limit should be as near the L_{A90} + 10 dB(A) criteria as practicable during normal working hours (07:00 – 19:00) and should not exceed 55 dB(A) $L_{Aeq,\ 1h}$ (free field).

5.3.2 The table below presents an assessment of noise from normal operations associated with the proposed scheme. The site noise level predictions presented in the table below take into consideration the beneficial effects of acoustic and visual screening bunds proposed as part of the working scheme. Following the sale of High Close Farm, additional bunds have been included within the design of the scheme to enhance the screening of noise from the site in the vicinity of this receptor.

Location	Phase	Predicted Worst Case Site Noise Level dB $L_{Aeq,1h}$ (free-field)			Back-ground Noise Level	Difference between site Noise and Background Level			Difference between Site Noise and 55 dB(A) Limit		
		Normal	During Breaking Oversize	During Drilling Blast Holes							
Eweclose	1	39	40	42	38	+1	+2	+4	-16	-15	-13
	2	36	36	40		-2	-2	+2	-19	-19	-15
	3	35	35	40		-3	-3	+2	-20	-20	-15
	4	35	36	40		-3	-2	+2	-20	-19	-15
	5	35	36	40		-3	-2	+2	-20	-19	-15
Parsonby Farm	1	40	41	43	39	+1	+2	+4	-15	-14	-12
	2	38	39	44		-1	0	+5	-17	-16	-11
	3	36	37	43		-3	-2	+4	-19	-18	-12
	4	35	35	41		-4	-4	+2	-20	-20	-14
	5	33	34	39		-6	-5	0	-22	-21	-16
The Muslins	1	41	41	44	38	+3	+3	+6	-14	-14	-11
	2	38	39	44		0	+1	+6	-17	-16	-11
	3	36	37	43		-2	-1	+5	-19	-18	-12
	4	35	35	40		-3	-3	+2	-20	-20	-15
	5	33	34	39		-5	-4	+1	-22	-21	-16
Adam’s Ghyll	1	41	41	44	38	+3	+3	+6	-14	-14	-11
	2	38	39	43		0	+1	+5	-17	-16	-12
	3	36	37	42		-2	-1	+4	-19	-18	-13
	4	35	35	40		-3	-3	+2	-20	-20	-15
	5	34	34	39		-4	-4	+1	-21	-21	-16
High Close Farm	1	49	50	52	37	+12	+13	+15	-6	-5	-3
	2	47	48	52		+10	+11	+15	-8	-7	-3
	3	44	45	51		+7	+8	+14	-11	-10	-4
	4	40	41	46		+3	+4	+9	-15	-14	-9
	5	38	39	44		+1	+2	+7	-17	-16	-11
Plumbland Primary	1	38	39	42	39	-1	0	+3	-17	-16	-13
	2	36	37	41		-3	-2	+2	-19	-18	-14
	3	35	35	41		-4	-4	+2	-20	-20	-14
	4	33	34	39		-6	-5	0	-22	-21	-16
	5	32	32	37		-7	-7	-2	-23	-23	-18

5.3.3 The results of the assessment demonstrate that potential noise levels are not expected to exceed the background level by more than 10 dB with the exception of at High Close Farm where worst-case noise levels have the potential to exceed the background noise level by up to 15 dB. This is expected to occur on an infrequent basis given the worst-case assumptions made regarding the location of mobile plant within the calculations and the longer term noise levels are anticipated to be significantly lower.

5.3.4 Noise levels in excess of the desirable 10 dB above background level have the potential to occur during Phase 1 and also during Phase 2 but only when undertaking rock breaking or drilling operations. Breaking is expected to be undertaken on an occasional basis and only when oversize material is generated by a blast and not required by the market as rock armour. The drilling of blast holes is also expected to be limited with blasting only taking place around once per week. As the quarry develops in a southerly direction and all processing operations are undertaken within the quarry void noise levels are not expected to exceed the background noise levels by more than 10 dB.

5.3.5 Notwithstanding the above, potential noise levels from normal operations are not expected to exceed the recommended limit of 55 dB at any noise-sensitive premises including High Close Farm.

5.3.6 PPG-Minerals states that where it will be difficult not to exceed the background level by more than 10dB(A) without imposing unreasonable burdens on the mineral operator the limit set should be as near that level as practicable and the total noise from the operations should not exceed 55dB(A) $L_{Aeq,\ 1h}$ (free field). Given the proximity of High Close Farm to the permitted quarry site, and the significant level of noise mitigation in the form of additional screening bunds that have been incorporated into the scheme to reduce the potential noise impact specifically at High Close Farm, it is considered appropriate to assess noise impact at this receptor with reference to a guide level of 55 dB as recommended by PPG-Minerals.

5.3.7 In relation to the noise exposure hierarchy outlined in planning practice guidance, the potential impacts are considered to be at or below the LOAEL at the majority of noise-sensitive premises with the potential for effects above the LOAEL but below the SOAEL at High Close Farm. At levels above the LOAEL further consideration needs to be given to mitigating and minimising those effects and, in addition to the acoustic screening that has already been incorporated into the proposed scheme, it is suggested that this could be achieved via suitably worded planning conditions setting appropriate noise limits and requiring the preparation and submission of a Noise Monitoring and Management Plan.

5.4 WHO Guidelines

5.4.1 Although it is considered that the guidance provided by Government specifically in relation to noise emissions from mineral sites should take precedence over other guidance, comment in relation to the WHO '*Guidelines for Community Noise*' has also been made at the request of Allerdale Borough Council Environmental Health Department.

5.4.2 The WHO annoyance limits of 50 and 55 dB (outlined in section 2.3.4 of this report) are referenced to a 16 hour time base from 0700 – 2300. Assuming the worst-case quarry noise level of 52 dB $L_{Aeq,1h}$ at High Close Farm is realised for each hour during the proposed site operating period of 0700 – 1800 and that from 1800 – 2300 no noise-generating activities take place at the site then the 16 hour daytime exposure to quarry noise is 50 dB $L_{Aeq,16h}$ (worst-case) and therefore significantly below the level at which serious annoyance would be expected.

5.4.3 In relation to schools and preschools, WHO guidelines suggests that the sound pressure level of the noise from external sources should not exceed 55 dB L_{Aeq}, the same value given for outdoor residential areas during the daytime. Predicted noise levels from the proposed scheme at Plumbland Primary School are expected to be up to 42 dB L_{Aeq} and therefore significantly below recommended limit.

5.5 Instantaneous Noise

5.5.1 The assessment of instantaneous noise levels is typically only undertaken when noise from the proposed development is expected to occur during the night-time period. L_{Amax} levels are recommended by WHO guidance as a suitable descriptor to indicate the probability of sleep disturbance and noise induced awakenings.

5.5.2 The development proposes to minimise instantaneous noises via the provision of acoustic screening bunds and adherence to the best practice noise control measures provided in section 6 of this report. The measures recommended within section 6 could be formalised by a suitably worded planning condition requiring the preparation and submission of a Noise Monitoring and Management Plan.

6.0 RECOMMENDATIONS

6.1 With regards to general site activities, the following noise control measures should be considered to demonstrate that best practicable means are being implemented and to minimise the potential off-site noise impact:

(a) Adhere strictly to the stated operating hours of the site and ensure that site working hour restrictions are effectively communicated to all site staff and subcontractors;

(b) Audible reversing warning systems on mobile plant and vehicles should be of a type which, whilst ensuring that they give proper warning, has a minimum noise impact on persons outside sites;

(c) Ensure that all plant complies with the relevant statutory requirements regarding noise emissions;

(d) Ensure machinery is adequately maintained and silenced in accordance with the manufacturer's recommendations at all times. Any defective items should not be used;

(e) Minimise drop heights of materials and, whenever practicable, materials should be lowered rather than dropped;

(f) Start up plant and vehicles sequentially rather than all together;

(g) Avoid unnecessary horn usage and revving of engines;

(h) Switch off or throttle-down equipment when not required;

(i) Any covers, panels or enclosure doors to engines should be kept closed when the equipment is in use;

(j) Keep internal haul routes clear and well maintained. Avoid steep gradients where possible;

(k) Ensure any soil storage bunds used for noise mitigation purposes are to the required height and length, with no gaps or inconsistencies;

(l) Regular inspections of plant, particularly conveyor systems, should be undertaken to identify any faults or wear and tear that may be resulting in excessive noise;

(m) Operatives should be trained to employ appropriate techniques to keep site noise to a minimum, and should be effectively supervised to ensure that best working practice in respect of noise reduction is followed.

7.0 SUMMARY

7.1 Vibrock Limited were commissioned to undertake a noise assessment to accompany a planning application for a proposed scheme of mineral extraction at High Close Quarry.

7.2 A visual survey of the site has been made and existing baseline noise levels measured at locations representing noise-sensitive premises within the vicinity of the proposed operations.

7.3 A series of noise level predictions associated with proposed activities at the site have been made to the identified noise-sensitive locations and these have been assessed against relevant criteria including that outlined within Planning Practice Guidance to the NPPF which are reflected in local mineral policy. All predictions have been calculated with the combinations of plant working at the closest point to each assessment location. They are therefore worst case scenarios which may be of relatively short duration, however, they indicate the maximum $L_{Aeq,1h}$ (free-field) noise level to which a particular property or group of properties may be exposed during the working of the site. The worst case situation may occur intermittently over the lifetime of the site, but longer term noise levels perceived outside of the site boundary would normally be significantly less.

7.4 The results of the assessment demonstrate that the proposed scheme can be implemented by the operator whilst adhering to the noise standards contained within current Planning Practice Guidance for mineral sites. Additional reference to WHO guidelines has also been made which has demonstrated that noise associated with the proposed development is expected to be below the guide values relating to annoyance for both residential and school settings.

7.5 The requirement for mitigation has been identified and the working scheme modified to include enhanced acoustic screening to the north of the site. In addition to the improved screening, recommendations have been made to further control noise from the site including the setting of noise limits and the preparation of a noise monitoring and management plan both of which could be secured via condition.

7.6 It is therefore considered that there will be no significant or unacceptable adverse impacts at noise-sensitive premises in the vicinity of the proposed operations. The overall potential noise impact of the development is considered to be in line with national and local planning policy which seeks to prevent and avoid any significant or unacceptable adverse impacts and, where necessary, mitigate and reduce to a minimum other adverse impacts.

8.0 REFERENCES

1. ANC Guidelines: *Environmental Sound Measurement Guide*. May 2021.

2. British Standard 5228-1:2009+A1:2014 *Code of practice for noise and vibration control on construction and open sites. Part 1: Noise*. British Standards Institution 2014.

3. British Standard 7445-1:2003 *Description and measurement of environmental noise – Part 1 Guide to quantities and procedures*. British Standards Institution 2003.

4. National Planning Policy Framework – Ministry of Housing, Communities and Local Government. July 2021.

5. Noise Policy Statement for England. Government Department for Environment, Food and Rural Affairs. March 2010.

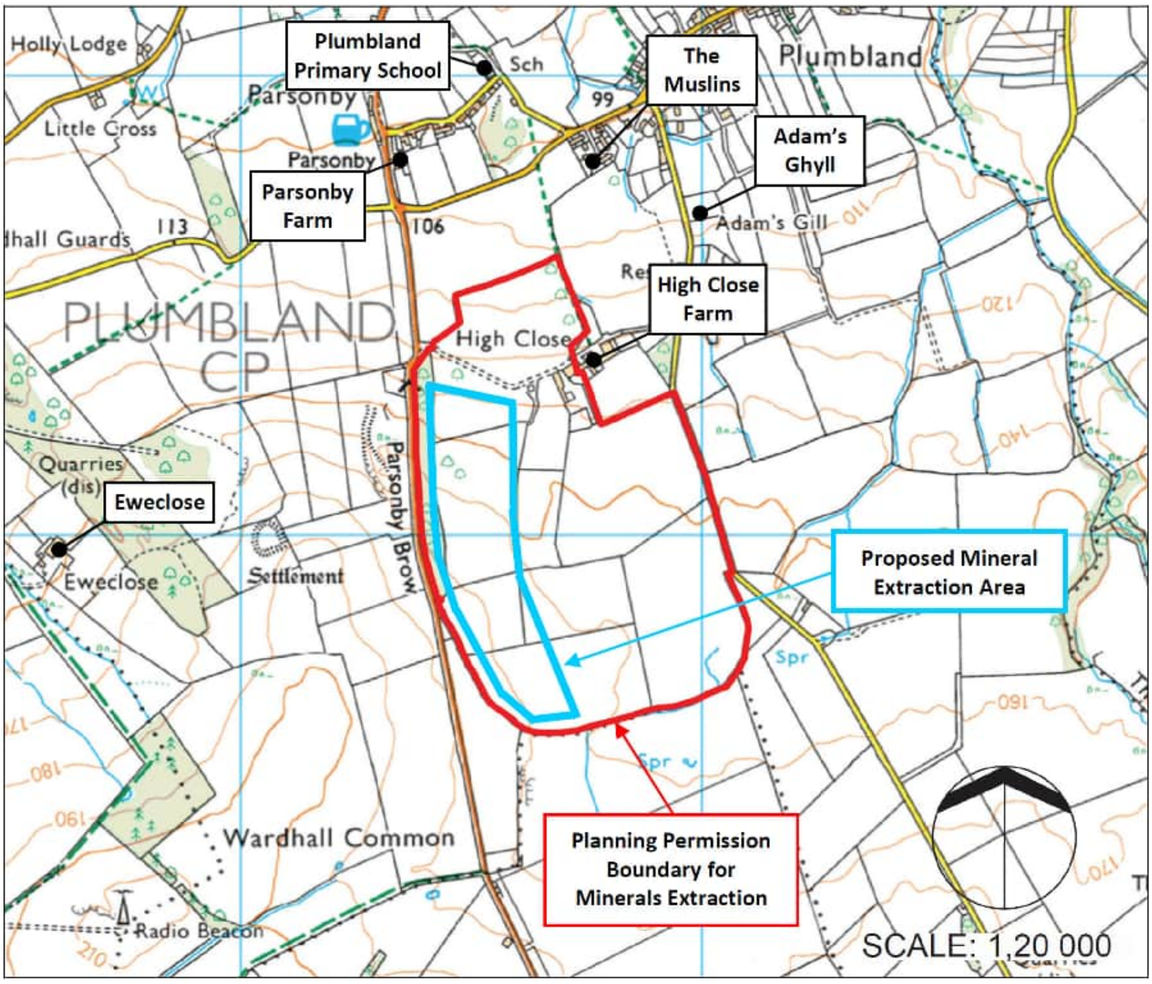
6. Planning Practice Guidance: Minerals – Ministry of Housing, Communities and Local Government. October 2014.

7. Planning Practice Guidance: Noise – Ministry of Housing, Communities and Local Government. July 2019.

8. *Guidelines for Environmental Noise Impact Assessment*, v1.2. Institute of Environmental Management & Assessment. November 2014.

FIGURE 1

Assessment Location Plan



APPENDIX 1

Baseline Noise Survey Data

Location: Eweclose

Measurement Date and Start Time	$L_{Aeq,15min}$ (dB)	$L_{Amax,15min}$ (dB)	$L_{A90,15min}$ (dB)
19/04/2017 13:45	53.4	83.8	39.5
19/04/2017 14:00	54.7	77.0	40.7
19/04/2017 14:15	53.1	81.3	39.4
19/04/2017 14:30	53.8	73.8	39.3
19/04/2017 14:45	54.4	72.8	38.7
19/04/2017 15:00	54.0	75.7	39.1
19/04/2017 15:15	52.8	72.4	39.3
19/04/2017 15:30	52.8	73.4	39.5
Average Background Sound Level			**39.4**

Measurement Date and Start Time	$L_{Aeq,15min}$ (dB)	$L_{Amax,15min}$ (dB)	$L_{A90,15min}$ (dB)
11/10/2022 07:44	50.4	70.4	35.0
11/10/2022 10:39	51.7	73.7	36.6
11/10/2022 13:10	48.8	77.7	36.3
Average Background Sound Level			**36.0**

APPENDIX 1

Baseline Noise Survey Data

Location: Parsonby Farm

Measurement Date and Start Time	$L_{Aeq,15min}$ (dB)	$L_{Amax,15min}$ (dB)	$L_{A90,15min}$ (dB)
19/04/2017 13:30	45.5	62.4	39.3
19/04/2017 13:45	45.5	59.2	39.6
19/04/2017 14:00	45.5	60.5	38.9
19/04/2017 14:15	46.6	74.2	39.1
19/04/2017 14:30	44.7	60.4	38.7
19/04/2017 14:45	43.8	57.4	38.9
19/04/2017 15:00	46.4	70.2	39.4
19/04/2017 15:15	46.1	71.9	38.7
Average Background Sound Level			**39.1**

Measurement Date and Start Time	$L_{Aeq,15min}$ (dB)	$L_{Amax,15min}$ (dB)	$L_{A90,15min}$ (dB)
11/10/2022 08:58	55.7	73.2	38.2
11/10/2022 11:05	52.2	69.2	39.4
11/10/2022 13:33	55.4	76.7	37.9
Average Background Sound Level			**38.9**

APPENDIX 1

Baseline Noise Survey Data

Location: The Muslins, Adam's Ghyll

Measurement Date and Start Time	$L_{Aeq,15min}$ (dB)	$L_{Amax,15min}$ (dB)	$L_{A90,15min}$ (dB)
19/04/2017 13:00	59.7	89.3	37.9
19/04/2017 13:15	48.4	72.5	37.4
19/04/2017 13:30	59.3	86.7	37.6
19/04/2017 13:45	45.5	66.2	37.5
19/04/2017 14:00	52.9	77.3	37.8
19/04/2017 14:15	52.9	79.4	37.4
19/04/2017 14:30	54.8	79.0	37.1
19/04/2017 14:45	52.6	77.3	38.3
19/04/2017 15:00	51.6	75.7	38.7
Average Background Sound Level			**37.7**

Location: The Muslins

Measurement Date and Start Time	$L_{Aeq,15min}$ (dB)	$L_{Amax,15min}$ (dB)	$L_{A90,15min}$ (dB)
11/10/2022 08:34	51.3	65.2	39.3
11/10/2022 11:27	49.5	68.3	36.3
11/10/2022 13:56	49.9	72.6	38.4
Average Background Sound Level			**38.0**

Location: Adam's Ghyll

Measurement Date and Start Time	$L_{Aeq,15min}$ (dB)	$L_{Amax,15min}$ (dB)	$L_{A90,15min}$ (dB)
11/10/2022 09:23	51.9	74.9	38.4
11/10/2022 12:18	49.2	68.3	40.5
11/10/2022 14:38	44.3	59.4	40.7
Average Background Sound Level			**39.9**

APPENDIX 1

Baseline Noise Survey Data

Location: Plumbland C of E Primary School

Measurement Date and Start Time	$L_{Aeq,15min}$ (dB)	$L_{Amax,15min}$ (dB)	$L_{A90,15min}$ (dB)
16/12/2019 09:35	47.8	68.7	39.1
16/12/2019 09:50	50.8	59.4	40.5
16/12/2019 13:15	49.2	75.2	41.6
16/12/2019 13:30	48.5	79.3	39.4
Average Background Sound Level			**40.2**

Measurement Date and Start Time	$L_{Aeq,15min}$ (dB)	$L_{Amax,15min}$ (dB)	$L_{A90,15min}$ (dB)
11/10/2022 08:13	45.7	69.6	37.3
11/10/2022 11:48	46.3	69.2	36.7
11/10/2022 14:17	46.4	72.2	37.8
Average Background Sound Level			**37.3**

APPENDIX 1

Baseline Noise Survey Data

Location: High Close Farm

Measurement Date and Start Time	$L_{Aeq,15min}$ (dB)	$L_{Amax,15min}$ (dB)	$L_{A90,15min}$ (dB)
11/10/2022 10:30	40.7	58.5	36.2
11/10/2022 10:45	40.7	52.8	37.2
11/10/2022 11:00	38.8	50.7	35.0
11/10/2022 11:15	40.2	51.9	36.3
11/10/2022 11:30	52.4	73.4	38.4
11/10/2022 11:45	41.2	56.0	36.5
11/10/2022 12:00	41.5	54.4	36.9
11/10/2022 12:15	41.1	53.9	35.3
11/10/2022 12:30	42.4	56.9	37.2
11/10/2022 12:45	41.8	53.6	37.9
Average Background Sound Level			**36.7**

APPENDIX 2

Noise Source Details

Description of Plant/Activity	Sound Power Level dB(A)	Assumptions
Soil Stripping , Overburden Storage, Bund Formation, Restoration		
Tracked Excavator	104	75% on-time
Dozer	106	75% on-time
Articulated Dump Trucks	105	10 movements/hour
Dump Truck (Tipping Soils and OB)	107	25% on-time
Extraction, Processing, Stockpiling and Haulage		
Drill Rig (Blast Holes) (occasional – blasting expected to be once per week)	115	100% on-time
Hydraulic Rock Breaking of Oversize (occasional use)	108	100% on-time
40 – 50t Tracked Excavator Loading Mobile Primary Crusher and Secondary Cone Crusher with re-circulation belt	113	100% on-time
26t Wheeled Loading Shovel (Managing Stockpile and Loading HGVs)	106	50% on-time
Mobile 4-way Split Screening Plant	107	100% on-time
Land Conveyor Drive Units (Phase 1 only)	102	100% on-time
Electric Generator (Phase 1 only)	86	100% on-time
Diesel Water Pump (+ enclosure)	92	100% on-time
Fuel Storage Tank	93	10% on-time
HGV manoeuvring on weighbridge	96	10% on-time
Road Lorries	101	8 movements/hour
Tractor and Water/Fuel Bowser	108	4 movements/hour

APPENDIX 3

Noise Level Calculations – Short-term Operations

RECEPTOR: **EWECLOSE**

SHORT-TERM OPERATIONS - PHASE 1

Fixed Plant or Mobile Plant Working in a Limited Area (BS 5228-1:2009+A1:2014 Section F.2.3)

Plant/Activity	Location	Sound Power Level L_{WA} dB(A)	Activity On-time %	On-time Correction dB	Distance metres	Distance Correction dB	Screening Correction dB	Soft Ground %	Soft Ground Correction up to 300m dB	Highest of Soft Ground or Screening dB	Resultant $L_{Aeq,1h}$ (free-field) dB(A)
Point Sources											
Drill Rig	Quarry Bench	115	100	0.0	845	-66.5	-10	100	-5.4	-10.0	38.5
Excavator Loading Crushers	Quarry Void	113	100	0.0	870	-66.8	-10	100	-5.4	-10.0	36.2
Conveyor Drive Unit	Quarry Void	102	100	0.0	870	-66.8	-10	100	-5.4	-10.0	25.2
Breaker/Pecker (Oversize)	Quarry Void	108	100	0.0	870	-66.8	-10	100	-5.4	-10.0	31.2
Mobile Screening Plant	Processing Area	107	100	0.0	1195	-69.5	-5	100	-5.4	-5.4	32.1
Loading Shovel	Processing Area	106	50	-3.0	1195	-69.5	-5	100	-5.4	-5.4	28.0
Conveyor Drive Unit+Electric Generator	Processing Area	102	100	0.0	1155	-69.3	-5	100	-5.4	-5.4	27.3
Diesel Water Pump	Processing Area	92	100	0.0	1165	-69.3	-5	100	-5.4	-5.4	17.3
Fuel Storage Tank	Processing Area	93	10	-10.0	1175	-69.4	-5	100	-5.4	-5.4	8.2
Weighbridge	Processing Area	96	10	-10.0	1140	-69.1	-5	100	-5.4	-5.4	11.5
				0.0		0.0			0.0	0.0	0.0
Excavator	Soils and Overburden	104	75	-1.2	840	-66.5	0	100	-5.4	-5.4	30.9
Dozer	Soils and Overburden	106	75	-1.2	840	-66.5	0	100	-5.4	-5.4	32.9
Tipping	Soils and Overburden	107	25	-6.0	840	-66.5	0	100	-5.4	-5.4	29.1
				0.0		0.0			0.0	0.0	0.0
				0.0		0.0			0.0	0.0	0.0
				0.0		0.0			0.0	0.0	0.0
				0.0		0.0			0.0	0.0	0.0
				0.0		0.0			0.0	0.0	0.0
				0.0		0.0			0.0	0.0	0.0
										SUM	42.9

Mobile Plant/HGV Movements (BS 5228-1:2009+A1:2014 Section F.2.5)

Plant/Activity	Location	Sound Power Level L_{WA} dB(A)	Movement Per Hour	Speed kmph	Distance metres	$L_{Aeq,T}$ dB(A)	Angle of View degrees	Angle of View Correction dB	Screening Correction dB		Resultant $L_{Aeq,1h}$ (free-field) dB(A)
Moving Point Sources											
HGV	Access Road / Processing Area	101	8	24	860	33.9	90	-3.0	-5		25.9
Tractor and Bowser	Processing Area/Access/Haul Routes	108	2	24	840	35.0	180	0.0	0		35.0
Dumptrucks	Soils and Overburden	105	10	24	840	39.0	180	0.0	0		39.0
						0.0		0.0			0.0
						0.0		0.0			0.0
										SUM	40.6
										TOTAL	**44.9**

APPENDIX 3

Noise Level Calculations – Short-term Operations

RECEPTOR:	PARSONBY FARM										
SHORT-TERM OPERATIONS - PHASE 1											
Fixed Plant or Mobile Plant Working in a Limited Area (BS 5228-1:2009+A1:2014 Section F.2.3)											
Plant/Activity	**Location**	**Sound Power Level L_{WA} dB(A)**	**Activity On-time %**	**On-time Correction dB**	**Distance metres**	**Distance Correction dB**	**Screening Correction dB**	**Soft Ground %**	**Soft Ground Correction up to 300m dB**	**Highest of Soft Ground or Screening dB**	**Resultant $L_{Aeq,1h}$ (free-field) dB(A)**
Point Sources											
Drill Rig	Quarry Bench	115	100	0.0	675	-64.6	-10	100	-5.4	-10.0	40.4
Excavator Loading Crushers	Quarry Void	113	100	0.0	700	-64.9	-10	100	-5.4	-10.0	38.1
Conveyor Drive Unit	Quarry Void	102	100	0.0	700	-64.9	-10	100	-5.4	-10.0	27.1
Breaker/Pecker (Oversize)	Quarry Void	108	100	0.0	700	-64.9	-10	100	-5.4	-10.0	33.1
Mobile Screening Plant	Processing Area	107	100	0.0	805	-66.1	-10	100	-5.4	-10.0	30.9
Loading Shovel	Processing Area	106	50	-3.0	805	-66.1	-10	100	-5.4	-10.0	26.9
Conveyor Drive Unit+Electric Generator	Processing Area	102	100	0.0	750	-65.5	-10	100	-5.4	-10.0	26.5
Diesel Water Pump	Processing Area	92	100	0.0	730	-65.3	-10	100	-5.4	-10.0	16.7
Fuel Storage Tank	Processing Area	93	10	-10.0	865	-66.7	-10	100	-5.4	-10.0	6.3
Weighbridge	Processing Area	96	10	-10.0	855	-66.6	-10	100	-5.4	-10.0	9.4
				0.0		0.0			0.0	0.0	0.0
Excavator	Soils and Overburden	104	75	-1.2	445	-61.0	0	100	-5.4	-5.4	36.4
Dozer	Soils and Overburden	106	75	-1.2	445	-61.0	0	100	-5.4	-5.4	38.4
Tipping	Soils and Overburden	107	25	-6.0	445	-61.0	0	100	-5.4	-5.4	34.6
				0.0		0.0			0.0	0.0	0.0
				0.0		0.0			0.0	0.0	0.0
				0.0		0.0			0.0	0.0	0.0
				0.0		0.0			0.0	0.0	0.0
				0.0		0.0			0.0	0.0	0.0
				0.0		0.0			0.0	0.0	0.0
										SUM	**45.6**
Mobile Plant/HGV Movements (BS 5228-1:2009+A1:2014 Section F.2.5)											
Plant/Activity	**Location**	**Sound Power Level L_{WA} dB(A)**	**Movement Per Hour**	**Speed kmph**	**Distance metres**	**$L_{Aeq,T}$ dB(A)**	**Angle of View degrees**	**Angle of View Correction dB**	**Screening Correction dB**		**Resultant $L_{Aeq,1h}$ (free-field) dB(A)**
Moving Point Sources											
HGV	Access Road / Processing Area	101	8	24	805	34.2	140	-1.1	-10		23.1
Tractor and Bowser	Processing Area/Access/Haul Routes	108	2	24	445	37.7	140	-1.1	0		36.6
Dumptrucks	Soils and Overburden	105	10	24	445	41.7	180	0.0	0		41.7
						0.0		0.0			0.0
						0.0		0.0			0.0
										SUM	**42.9**
										TOTAL	**47.5**

APPENDIX 3

Noise Level Calculations – Short-term Operations

RECEPTOR: THE MUSLINS

SHORT-TERM OPERATIONS - PHASE 1

Fixed Plant or Mobile Plant Working in a Limited Area (BS 5228-1:2009+A1:2014 Section F.2.3)

Plant/Activity	Location	Sound Power Level L_{WA} dB(A)	Activity On-time %	On-time Correction dB	Distance metres	Distance Correction dB	Screening Correction dB	Soft Ground %	Soft Ground Correction up to 300m dB	Highest of Soft Ground or Screening dB	Resultant $L_{Aeq,1h}$ (free-field) dB(A)
Point Sources											
Drill Rig	Quarry Bench	115	100	0.0	650	-64.3	-10	100	-5.4	-10.0	40.7
Excavator Loading Crushers	Quarry Void	113	100	0.0	675	-64.6	-10	100	-5.4	-10.0	38.4
Conveyor Drive Unit	Quarry Void	102	100	0.0	675	-64.6	-10	100	-5.4	-10.0	27.4
Breaker/Pecker (Oversize)	Quarry Void	108	100	0.0	675	-64.6	-10	100	-5.4	-10.0	33.4
Mobile Screening Plant	Processing Area	107	100	0.0	665	-64.5	-10	100	-5.4	-10.0	32.5
Loading Shovel	Processing Area	106	50	-3.0	665	-64.5	-10	100	-5.4	-10.0	28.5
Conveyor Drive Unit+Electric Generator	Processing Area	102	100	0.0	635	-64.1	-10	100	-5.4	-10.0	27.9
Diesel Water Pump	Processing Area	92	100	0.0	610	-63.7	-10	100	-5.4	-10.0	18.3
Fuel Storage Tank	Processing Area	93	10	-10.0	745	-65.4	-10	100	-5.4	-10.0	7.6
Weighbridge	Processing Area	96	10	-10.0	750	-65.5	-10	100	-5.4	-10.0	10.5
				0.0		0.0			0.0	0.0	0.0
Excavator	Soils and Overburden	104	75	-1.2	510	-62.2	0	100	-5.4	-5.4	35.2
Dozer	Soils and Overburden	106	75	-1.2	510	-62.2	0	100	-5.4	-5.4	37.2
Tipping	Soils and Overburden	107	25	-6.0	510	-62.2	0	100	-5.4	-5.4	33.4
				0.0		0.0			0.0	0.0	0.0
				0.0		0.0			0.0	0.0	0.0
				0.0		0.0			0.0	0.0	0.0
				0.0		0.0			0.0	0.0	0.0
				0.0		0.0			0.0	0.0	0.0
				0.0		0.0			0.0	0.0	0.0
										SUM	**45.5**

Mobile Plant/HGV Movements (BS 5228-1:2009+A1:2014 Section F.2.5)

Plant/Activity	Location	Sound Power Level L_{WA} dB(A)	Movement Per Hour	Speed kmph	Distance metres	$L_{Aeq,T}$ dB(A)	Angle of View degrees	Angle of View Correction dB	Screening Correction dB		Resultant $L_{Aeq,1h}$ (free-field) dB(A)
Moving Point Sources											
HGV	Access Road / Processing Area	101	8	24	665	35.0	140	-1.1	-10		23.9
Tractor and Bowser	Processing Area/Access/Haul Routes	108	2	24	510	37.1	140	-1.1	0		36.0
Dumptrucks	Soils and Overburden	105	10	24	510	41.1	180	0.0	0		41.1
						0.0		0.0			0.0
						0.0		0.0			0.0
										SUM	**42.4**
										TOTAL	**47.2**

APPENDIX 3

Noise Level Calculations – Short-term Operations

RECEPTOR: **ADAM'S GHYLL**

SHORT-TERM OPERATIONS - PHASE 1

Fixed Plant or Mobile Plant Working in a Limited Area (BS 5228-1:2009+A1:2014 Section F.2.3)

Plant/Activity	Location	Sound Power Level L_{WA} dB(A)	Activity On-time %	On-time Correction dB	Distance metres	Distance Correction dB	Screening Correction dB	Soft Ground %	Soft Ground Correction up to 300m dB	Highest of Soft Ground or Screening dB	Resultant $L_{Aeq,1h}$ (free-field) dB(A)
Point Sources											
Drill Rig	Quarry Bench	115	100	0.0	670	-64.5	-10	100	-5.4	-10.0	40.5
Excavator Loading Crushers	Quarry Void	113	100	0.0	695	-64.8	-10	100	-5.4	-10.0	38.2
Conveyor Drive Unit	Quarry Void	102	100	0.0	695	-64.8	-10	100	-5.4	-10.0	27.2
Breaker/Pecker (Oversize)	Quarry Void	108	100	0.0	695	-64.8	-10	100	-5.4	-10.0	33.2
Mobile Screening Plant	Processing Area	107	100	0.0	600	-63.6	-10	100	-5.4	-10.0	33.4
Loading Shovel	Processing Area	106	50	-3.0	600	-63.6	-10	100	-5.4	-10.0	29.4
Conveyor Drive Unit+Electric Generator	Processing Area	102	100	0.0	595	-63.5	-10	100	-5.4	-10.0	28.5
Diesel Water Pump	Processing Area	92	100	0.0	570	-63.1	-10	100	-5.4	-10.0	18.9
Fuel Storage Tank	Processing Area	93	10	-10.0	680	-64.7	-10	100	-5.4	-10.0	8.3
Weighbridge	Processing Area	96	10	-10.0	690	-64.8	-10	100	-5.4	-10.0	11.2
				0.0		0.0			0.0	0.0	0.0
Excavator	Soils and Overburden	104	75	-1.2	420	-60.5	0	100	-5.4	-5.4	36.9
Dozer	Soils and Overburden	106	75	-1.2	420	-60.5	0	100	-5.4	-5.4	38.9
Tipping	Soils and Overburden	107	25	-6.0	420	-60.5	0	100	-5.4	-5.4	35.1
				0.0		0.0			0.0	0.0	0.0
				0.0		0.0			0.0	0.0	0.0
				0.0		0.0			0.0	0.0	0.0
				0.0		0.0			0.0	0.0	0.0
				0.0		0.0			0.0	0.0	0.0
				0.0		0.0			0.0	0.0	0.0
										SUM	46.0

Mobile Plant/HGV Movements (BS 5228-1:2009+A1:2014 Section F.2.5)

Plant/Activity	Location	Sound Power Level L_{WA} dB(A)	Movement Per Hour	Speed kmph	Distance metres	$L_{Aeq,T}$ dB(A)	Angle of View degrees	Angle of View Correction dB	Screening Correction dB		Resultant $L_{Aeq,1h}$ (free-field) dB(A)
Moving Point Sources											
HGV	Access Road / Processing Area	101	8	24	600	35.4	140	-1.1	-10		24.4
Tractor and Bowser	Processing Area/Access/Haul Routes	108	2	24	420	38.0	140	-1.1	0		36.9
Dumptrucks	Soils and Overburden	105	10	24	420	42.0	180	0.0	0		42.0
						0.0		0.0			0.0
						0.0		0.0			0.0
										SUM	43.2
										TOTAL	**47.8**

APPENDIX 3

Noise Level Calculations – Short-term Operations

RECEPTOR:	HIGH CLOSE FARM										
SHORT-TERM OPERATIONS - PHASE 1											
Fixed Plant or Mobile Plant Working in a Limited Area (BS 5228-1:2009+A1:2014 Section F.2.3)											
Plant/Activity	**Location**	**Sound Power Level L_{WA} dB(A)**	**Activity On-time %**	**On-time Correction dB**	**Distance metres**	**Distance Correction dB**	**Screening Correction dB**	**Soft Ground %**	**Soft Ground Correction up to 300m dB**	**Highest of Soft Ground or Screening dB**	**Resultant $L_{Aeq,1h}$ (free-field) dB(A)**
Point Sources											
Drill Rig	Quarry Bench	115	100	0.0	275	-56.8	-10	100	-5.2	-10.0	48.2
Excavator Loading Crushers	Quarry Void	113	100	0.0	300	-57.5	-10	100	-5.4	-10.0	45.5
Conveyor Drive Unit	Quarry Void	102	100	0.0	300	-57.5	-10	100	-5.4	-10.0	34.5
Breaker/Pecker (Oversize)	Quarry Void	108	100	0.0	300	-57.5	-10	100	-5.4	-10.0	40.5
Mobile Screening Plant	Processing Area	107	100	0.0	230	-55.2	-10	100	-4.8	-10.0	41.8
Loading Shovel	Processing Area	106	50	-3.0	230	-55.2	-10	100	-4.8	-10.0	37.8
Conveyor Drive Unit+Electric Generator	Processing Area	102	100	0.0	210	-54.4	-10	100	-4.6	-10.0	37.6
Diesel Water Pump	Processing Area	92	100	0.0	180	-53.1	-10	100	-4.3	-10.0	28.9
Fuel Storage Tank	Processing Area	93	10	-10.0	300	-57.5	-10	100	-5.4	-10.0	15.5
Weighbridge	Processing Area	96	10	-10.0	310	-57.8	-10	100	-5.4	-10.0	18.2
				0.0		0.0			0.0	0.0	0.0
Excavator	Soils and Overburden	104	75	-1.2	125	-49.9	0	100	-3.5	-3.5	49.3
Dozer	Soils and Overburden	106	75	-1.2	125	-49.9	0	100	-3.5	-3.5	51.3
Tipping	Soils and Overburden	107	25	-6.0	125	-49.9	0	100	-3.5	-3.5	47.6
				0.0		0.0			0.0	0.0	0.0
				0.0		0.0			0.0	0.0	0.0
				0.0		0.0			0.0	0.0	0.0
				0.0		0.0			0.0	0.0	0.0
				0.0		0.0			0.0	0.0	0.0
				0.0		0.0			0.0	0.0	0.0
										SUM	**56.2**
Mobile Plant/HGV Movements (BS 5228-1:2009+A1:2014 Section F.2.5)											
Plant/Activity	**Location**	**Sound Power Level L_{WA} dB(A)**	**Movement Per Hour**	**Speed kmph**	**Distance metres**	**$L_{Aeq,T}$ dB(A)**	**Angle of View degrees**	**Angle of View Correction dB**	**Screening Correction dB**		**Resultant $L_{Aeq,1h}$ (free-field) dB(A)**
Moving Point Sources											
HGV	Access Road / Processing Area	101	8	24	230	39.6	140	-1.1	-10		28.5
Tractor and Bowser	Processing Area/Access/Haul Routes	108	2	24	125	43.2	140	-1.1	0		42.1
Dumptrucks	Soils and Overburden	105	10	24	125	47.2	180	0.0	0		47.2
						0.0		0.0			0.0
						0.0		0.0			0.0
										SUM	**48.4**
										TOTAL	**56.9**

APPENDIX 3

Noise Level Calculations – Short-term Operations

RECEPTOR: PLUMBLAND PRIMARY SCHOOL

SHORT-TERM OPERATIONS - PHASE 1

Fixed Plant or Mobile Plant Working in a Limited Area (BS 5228-1:2009+A1:2014 Section F.2.3)

Plant/Activity	Location	Sound Power Level L_{WA} dB(A)	Activity On-time %	On-time Correction dB	Distance metres	Distance Correction dB	Screening Correction dB	Soft Ground %	Soft Ground Correction up to 300m dB	Highest of Soft Ground or Screening dB	Resultant $L_{Aeq,1h}$ (free-field) dB(A)
Point Sources											
Drill Rig	Quarry Bench	115	100	0.0	825	-66.3	-10	100	-5.4	-10.0	38.7
Excavator Loading Crushers	Quarry Void	113	100	0.0	850	-66.6	-10	100	-5.4	-10.0	36.4
Conveyor Drive Unit	Quarry Void	102	100	0.0	850	-66.6	-10	100	-5.4	-10.0	25.4
Breaker/Pecker (Oversize)	Quarry Void	108	100	0.0	850	-66.6	-10	100	-5.4	-10.0	31.4
Mobile Screening Plant	Processing Area	107	100	0.0	895	-67.0	-10	100	-5.4	-10.0	30.0
Loading Shovel	Processing Area	106	50	-3.0	895	-67.0	-10	100	-5.4	-10.0	26.0
Conveyor Drive Unit+Electric Generator	Processing Area	102	100	0.0	855	-66.6	-10	100	-5.4	-10.0	25.4
Diesel Water Pump	Processing Area	92	100	0.0	830	-66.4	-10	100	-5.4	-10.0	15.6
Fuel Storage Tank	Processing Area	93	10	-10.0	965	-67.7	-10	100	-5.4	-10.0	5.3
Weighbridge	Processing Area	96	10	-10.0	965	-67.7	-10	100	-5.4	-10.0	8.3
				0.0		0.0			0.0	0.0	0.0
Excavator	Soils and Overburden	104	75	-1.2	645	-64.2	0	100	-5.4	-5.4	33.2
Dozer	Soils and Overburden	106	75	-1.2	645	-64.2	0	100	-5.4	-5.4	35.2
Tipping	Soils and Overburden	107	25	-6.0	645	-64.2	0	100	-5.4	-5.4	31.4
				0.0		0.0			0.0	0.0	0.0
				0.0		0.0			0.0	0.0	0.0
				0.0		0.0			0.0	0.0	0.0
				0.0		0.0			0.0	0.0	0.0
				0.0		0.0			0.0	0.0	0.0
				0.0		0.0			0.0	0.0	0.0
										SUM	**43.4**

Mobile Plant/HGV Movements (BS 5228-1:2009+A1:2014 Section F.2.5)

Plant/Activity	Location	Sound Power Level L_{WA} dB(A)	Movement Per Hour	Speed kmph	Distance metres	$L_{Aeq,T}$ dB(A)	Angle of View degrees	Angle of View Correction dB	Screening Correction dB		Resultant $L_{Aeq,1h}$ (free-field) dB(A)
Moving Point Sources											
HGV	Access Road / Processing Area	101	8	24	895	33.7	140	-1.1	-10		22.6
Tractor and Bowser	Processing Area/Access/Haul Routes	108	2	24	645	36.1	140	-1.1	0		35.0
Dumptrucks	Soils and Overburden	105	10	24	645	40.1	180	0.0	0		40.1
						0.0		0.0			0.0
						0.0		0.0			0.0
										SUM	**41.3**
										TOTAL	**45.5**

APPENDIX 4

Correspondence from Environmental Health Officers at Allerdale Borough Council (November 2019 and July 2020)

From: Cain, Richard [redacted]
Sent: 01 November 2019 14:40
To: Brophy, Rachel
Subject: 2/19/9011

FAO Rachel Brophy

Allerdale Environmental Health has reviewed the Application and attached Environmental Impact Assessment. Please see below comments and recommendations.

Appendix 4 Noise

Environmental Health have the following comments regards the Appendix 4 report.

- Environmental Health are satisfied with the worst case sound source levels which are taken from BS 5228 or previous studies where appropriate. Although methodology is discussed and appears adequate full detail of calculations used to ascertain the predicted noise levels at the receptors should be provided.
- Environmental Health note missing detail in regards quantified impact levels (Observed Adverse Effect Levels,(no / Lowest Observed Adverse Effect Level). There is no clear quantification discussion other than the noise is not a Significant Observed Adverse Effect Level.
- WHO guideline noise levels do not appear to have been considered or discussed against the predicted levels at any of the receptors. Particular concern is raised for the closest receptor High Close Farm which may be occupied as a residence. Effect on residential properties using BS 8233:2014 should also be discussed before impact levels are quantified.
- Although time averaged sound levels have been provided further information on instantaneous sounds levels (LMax) should also be discussed before instantaneous effect levels being discounted.

Environmental Health agree the sound levels which have been put forward are in compliance with the current national guideline noise planning condition for mineral planning.

Appendix 5 Dust and Air Quality

Additional regulation in regards to control of Dust and Air Quality will be required under Pollution Prevention and Control Regulations 2016.

This process will require a permit with conditions as advised in the Pollution Prevention and Control (England and Wales) Regulations 2016 before operations commence, and the applicant is advised to contact the environmental health service for confirmation and application.

Appendix 6 Blasting

Environmental Health have reviewed the information submitted in Appendix 6 of the Environmental Statement. Environmental Health are satisfied that the effects on neighbouring buildings has been quantified.

Environmental Health feel there is not enough detail provided in terms of the nuisance and amenity effects on people residing at the identified receptor points.

Blasting creates vibration which is of very short duration, with a frequency of events varying from a small number per year to several times per day, depending on the nature and size of the extraction operation. The frequency of blasting (number of blasts per day, week ,year) has not been identified within the report. The frequency of events is key determining the impact in terms of nuisance and amenity.

In terms of Nuisance and Amenity Environmental Health wish to draw attention to the following information taken from **BS 5228-2:2009 Code of Practice for noise and vibration control on Construction and open sites**. The following information relates directly to Blasting and best practice.

BS 5228 Part 2 Para 4 Community Relations

"Vibration and air overpressure from blasting operations is a special case and can under some circumstances give rise to concern or even alarm to persons unaccustomed to it. The adoption of good blasting practices will reduce the inherent and associated impulsive noise: prior warning to members of the public, individually if necessary, is important."

BS 5228 Part 2 Para 6.3

> *"c) Duration of site operations. In general, the longer the duration of activities on a site, the more likely it is that vibration from the site will prove to be an issue. In this context, good public relations and communication are important. Local residents might be willing to accept higher levels of vibration if they know that such levels will only last for a short time. It is then important that site operations are carried out according to the stated schedule and that the community is informed of their likely durations.*
>
> *d) Hours of work. Sensitivity to vibration at different times of the day is far more complex than sensitivity to noise. The sensitivity of the human body to vibration varies according to the direction and frequency of the vibration*
>
> *e) Attitude to the site operator. It is well established that people's attitudes to vibration can be influenced by their attitudes to the source or activity itself. Vibration from a site will tend to be accepted more readily by local residents, if they consider that the contractor is taking all possible measures to avoid unnecessary vibration. The attitude to the contractor can also be improved through good community liaison and information distribution and the provision of a helpline to respond to queries or complaints. The acceptability of the project itself can also be a factor in determining community reaction".*

Appendix 9 Geo Technical Assessment Of The Quarry Design
and
Appendix 10 Hydrogeology and Hydrology

Environmental Health have reviewed the submitted information and have concerns in regards to past use of the land as a Landfill.

Environmental Health are in agreement with the objection raised by the Environment Agency Ref- NO/2019/112052/01-L02 in response to insufficient information to demonstrate that the risk of pollution to controlled waters is acceptable.

The applicant/developer's attention is also drawn to the fact that there is the potential of contaminated land, soils and gas (potential for production and migration of landfill gas which may affect structures on or in proximity to the landfill site). You are reminded that the responsibility for safe development rests with the owner and/or developer.

Appendix 11 Proposed Planning Conditions

<u>Proposed conditions</u>

<u>Noise Conditions</u>

- Conditions 4,5,6. should be instated on any approval.

- Condition 4 – amendment as follows is required in regards to background noise levels as no specific measurement unit has been specified. *"Background noise level measured at any receptor should be via (LA90,1h) at any noise-sensitive property."*

In addition to the proposed conditions Environmental Health recommend the following condition to control noise emanating from the site.

- Before the development commences, a scheme shall be submitted to and agreed in writing by the local planning authority that specifies the provisions that will be implemented for the control of noise emanating from the site. The noise mitigation scheme shall be maintained for the life of the approved development and shall not be altered without the prior written approval of the local planning authority. The noise mitigation scheme must be inclusive of all mitigation measures presented in *Appendix 4 Noise* of the Environmental Impact Statement, it must also assure full compliance with all proposed noise conditions.

Control of Vibration Conditions

- Conditions 7, should be instated on any approval to control effects of any blasting.
- Condition 8 Should be amended in that a blast monitoring scheme shall be submitted and approved in writing by the mineral planning authority prior to the commencement of any blasting activities The scheme should robustly demonstrate compliance with Condition 7.

Further Condition recommended by Environmental Health

- Before the development commences, a scheme shall be submitted to and agreed in writing by the local planning authority that specifies the provisions that will be implemented for the control of vibration and air overpressure from blasting. The mitigation scheme shall be maintained for the life of the approved development and shall not be altered without the prior written approval of the local planning authority. The mitigation scheme must be inclusive of all mitigation measures presented in *Appendix 6 Blasting* of the Environmental Impact Statement, it must also assure full compliance with all proposed control of vibration conditions and use best practice for community relation and neighbourhood nuisance as stated in **BS 5228-2:2009.** A blasting schedule should be maintained and made available to residents with blasting confined to times of the day when disturbance is less likely.

Contaminated Land

Further Condition required by Environmental Health

Contaminated Land Conditions

1. Risk Assessment:
No development approved by this permission shall commence until a desktop study has been submitted to and approved by the Local Planning Authority. Should the preliminary risk assessment identify any potential contamination which may affect human health, controlled waters or the wider environment, all necessary site investigation works within the site boundary must be carried out to establish the degree and nature of the contamination and its potential to pollute the environment or cause harm to human health. The scope of works for the site investigations should be agreed with the Local Planning Authority prior to their commencement.

2. Submission of Remediation Scheme
Where land affected by contamination is found which poses unacceptable risks to human health, controlled waters or the wider environment, no development shall take place until a detailed remediation scheme has been submitted to and approved in writing by the Local Planning Authority. The scheme must include an appraisal of remediation options, identification of the preferred option(s), the proposed remediation objectives and remediation criteria, and a description and programme of the works to be undertaken including the verification plan.

3. Implementation of Approved Remediation Scheme

Should a remediation scheme be required, the approved strategy shall be implemented and a verification report submitted to and approved in writing by the Local Planning Authority, prior to the development (or relevant phase of development) being brought into use.

4. Reporting of Unexpected Contamination
In the event that contamination is found at any time when carrying out the approved development that was not previously identified it must be reported immediately to the Local Planning Authority. Development on the part of the site affected must be halted and a risk assessment carried out and submitted to and approved in writing by the Local Planning Authority. Where unacceptable risks are found remediation and verification schemes shall be submitted to and approved in writing by the Local Planning Authority. These shall be implemented prior to the development (or relevant phase of development) being brought into use. All work shall be undertaken in accordance with current UK guidance, particularly CLR11.

Richard Cain MCIEH | Environmental Health Officer
Allerdale Borough Council, Allerdale House, Workington, Cumbria, CA14 3YJ
[redacted]

Our Ref: **EPA1990 S79**
Your Ref: **High Close Quarry Planning Application**
This matter is being dealt with by: Ben Crowther
[redacted]

Email: environmental.health@allerdale.gov.uk

Allerdale
borough council
www.allerdale.gov.uk

14th July 2020

Mr Peter Stephenson
Stephenson Halliday
32 Lowther Street
Kendal
LA9 4DH

Dear Mr Stephenson

High Close Quarry, Environmental Protection Act 1990, S79 Part 2A

Allerdale BC and associated consultants have reviewed the information supplied to date. This information comprises the following documents:

High Close Quarry Development; Landfill Quarry Hydrogeological Relationship; for Stephenson Halliday Consultants, Report Ref 2934-R01 by Terraconsult, April 2020.

Vibrock; Assessment of Environmental Impact of Blasting at High Close Quarry, Parsonby, Cumbria, THOMAS ARMSTRONG LIMITED R20.9449/6/DW Date of Report: 07 May 2020.

Vibrock; Air Quality Assessment of Proposed Mineral Extraction Operations at High Close Quarry, Parsonby, Cumbria; for Thomas Armstrong Limited; Ref R20.9448/5/DW Dated 28th May 2020.

Vibrock; Noise Assessment; Proposed Mineral Extraction Operations at High Close Quarry, Parsonby, Cumbria, For Thomas Armstrong Limited, Ref: R20.9447/6/AP Date of Report: 02 June 2020.

> Allerdale BC believe these documents satisfy the requirements of the comments in Richard Cain's Email of 1st November 2019: In that the site could cause a serious environmental incident. Allerdale BC believes the above reports adequately address the concerns voiced regarding mobilisation of material from the former dilute and disperse landfill cell.

In conclusion the Issues raised in the above email are valid, and conditions should be added to any planning application with modifications as detailed in the November email.

Appendix 4, 5 and 6 have been justified. Please add relevant conditions

Appendix 10 has been satisfied; please add relevant conditions.

Conditions: Appendix 11:

Namely contaminated land the Terraconsult report adequately satisfies the requirement for the part 1 of the contaminated land contamination condition. Further reports are required and so these need to be generated and approved. Parts 2, 3 and 4 should remain as conditions.

Please do not hesitate to contact me if you require further information or wish to discuss this matter further.

Yours sincerely

[redacted]

Ben Crowther
Environmental Health Officer
Governance and Regulatory Services

POSITIVE ABOUT DISABLED PEOPLE

INVESTOR IN PEOPLE

Allerdale - a great place to live, work and visit

Allerdale Borough Council
Allerdale House
Workington
Cumbria CA14 3YJ
Tel: 0303 123 1702

APPENDIX 5

Acoustic Terminology and Definitions

Acoustic Environment
Sound from all sound sources as modified by the environment.

Sound Power Level (L_{WA})
The total amount of sound energy per unit of time generated by a particular sound source independent of the acoustic environment that it is in. It is a logarithmic measure of the sound power in comparison to a specified reference level.

Equivalent Continuous A-weighted Sound Pressure Level ($L_{Aeq,T}$)
Value of the A-weighted sound pressure level of a continuous, steady sound that, within a specified time interval *T*, has the same mean square sound pressure as a sound under consideration whose level varies with time.

A-weighting
A-weighting is used to replicate this sensitivity by modifying the electrical response of a sound level meter with frequency in approximately the same way as the sensitivity of the human hearing system. Measurements in dB(A) broadly agree with people's assessment of loudness.

Ambient Sound Level
Totally encompassing sound in a given situation at a given time, usually composed of sound from many sources near and far. Normally expressed as the equivalent continuous A-weighted sound pressure level ($L_{Aeq,T}$).

Specific Sound Level (also referred to as 'site noise')
Sound in the neighbourhood of a site that originates from the site i.e. the sound being assessed.

Background Sound Level ($L_{A90,T}$)
A-weighted sound pressure level of the residual sound at the assessment position with no operation occurring at the proposed site. Defined in terms of the $L_{A90,T}$ which is the "A weighted" noise level exceeded for 90 per cent of the specified measurement period (T).

Free-field
External sound field in which no significant sound reflections occur (apart from the ground).
NOTE Measurements made 1.2 metres to 1.5 metres above the ground and at least 3.5 metres away from other reflecting surfaces are usually regarded as free-field.

Noise-Sensitive Premises
Any occupied premises outside a site used as a dwelling (including gardens), place of worship, educational establishment, hospital or similar institution, or any other property likely to be adversely affected by an increase in noise level.

APPENDIX 5:
DUST AND AIR QUALITY

Air Quality Assessment of Proposed Mineral Extraction Operations at High Close Quarry, Parsonby, Cumbria

THOMAS ARMSTRONG LIMITED

R22.9448/9/DW

Date of Report: 30 November 2022

REPORT DETAILS

Client	Thomas Armstrong Limited
Report Title	Air Quality Assessment of Proposed Mineral Extraction Operations at High Close Quarry, Cumbria
Report Ref.	R22.9448/9/DW
Vibrock Contact	vibrock@vibrock.com

QUALITY ASSURANCE

Issue No.	**Status**	**Issue Date**	**Comments**	**Author**	**Technical Review**	**Approved**
9	Final	30/11/22	n/a	[redacted]		
				D Williams Director	R Kennedy Director	R Kennedy Director

This report has been prepared by Vibrock the trading name of Vibrock Limited, with all reasonable skill, care and diligence within the terms of the Contract with the client, incorporating our General Terms and Conditions of Business and taking account of the resources devoted to it by agreement with the client.

We disclaim any responsibility to the client and others in respect of any matters outside the scope of the above.

This report is confidential to the client and we accept no responsibility of whatsoever nature to third parties to whom this report, or any part thereof, is made known. Any such party relies on the report at their own risk.

Vibrock Limited
Shanakiel
Ilkeston Road, Heanor
Derbyshire, DE75 7DR
Tel: +44 (0) 1773 711211
Fax: +44 (0) 1773 711311
Email: vibrock@vibrock.com
Web: www.vibrock.com

COMPETENCY AND EXPERTISE

The Company

Vibrock Ltd is an established independent environmental consultancy who has been providing noise, dust and vibration consultancy services to industry since 1991. Vibrock Ltd is a member of the Association of Noise Consultants.

The Authors

Daniel Williams BSc, MIAQM has undertaken responsible work in air quality assessment since 2000. He specialises in the measurement and assessment of airborne pollutants from civil engineering projects, demolition projects and from mineral extraction operations. Daniel is a full Member of the Institute of Air Quality Management and has been involved in the assessment of air quality for planning applications and EIA development relating to mineral extraction sites throughout the UK.

Richard Kennedy B.Eng MIOA has been employed as a Consultant at Vibrock Limited since 2006, a Director of the Company since 2020, and has undertaken responsible work in occupational and environmental noise, dust and vibration assessments for major civil engineering projects, large manufacturing and processing industries and mineral extraction developments. In addition to a diploma in Acoustics and Noise Control, Richard is a full Member of the Institute of Acoustics.

NON-TECHNICAL SUMMARY

1. The plant required to work High Close Quarry, together with associated vehicle movements have the potential to generate dust and other airborne pollutants in the immediate vicinity of their operations. The likelihood of problems caused by such pollutants will be largely influenced by the effectiveness of on site environmental control.

2. Hence potential dust sources have been identified and best practice dust control measures recommended in order to minimise any such disturbance at nearby sensitive locations.

3. The current dust climate has been measured at the site boundary and these are seen to be typical of a rural area.

4. Climatic conditions local to the site have been accessed and analysed to give an indication of how often the site could be susceptible to fugitive dust events. Such occasions are relatively few.

5. A full PM_{10} and $PM_{2.5}$ assessment in line with the latest recommendations has been undertaken and this clearly shows that the Air Quality Objectives are not expected to be exceeded.

6. Given the intended dust control measures, we are confident that the site can be operated with minimal impact on nearby receptor locations.

CONTENTS

FIGURE

APPENDICES

1.0 INTRODUCTION

1.1 It is proposed by Thomas Armstrong Limited to commence mineral extraction operations at High Close Quarry. Vibrock Limited were commissioned by Stephenson Halliday to undertake an air quality assessment of the proposals. Vibrock Limited have been involved in the assessment of mineral dust impacts for over 30 years and therefore have significant experience in this field. The air quality assessment was undertaken in accordance with the guidance for dust emission provided in the Planning Practice Guidance to the National Planning Policy Framework and the most recent guidance from the Instute of Air Quality Management (IAQM) relating to the assessment of mineral dust impacts for planning.

1.2 The quarry working area is located to the south of the settlement of Parsonby.

1.3 The closest sensitive receptors to the site are identified within Figure 1, the closest of which are located in the settlement of Parsonby some 400 metres to the north east of the quarry as well as at individual farm houses and dwellings. There are no internationally designated ecological sites within 1000 metres of the proposed site boundary and therefore the dust impact upon ecological receptors is not considered further within this assessment.

1.4 The study benefits from a site inspection conducted in April and May 2017.

Context

1.5 An air quality assessment was completed for the proposal at High Close in April 2018; for commercial reasons Thomas Armstrong Limited delayed the submission of the application and the Environmental Statement.

1.6 This latest assessment has been updated following receipt of consultation responses on the application from Allerdale Borough Council Environmental Health Department dated 1 November 2019, Plumbland Parish Council Technical Memorandum dated 7 November 2019 and a Public Meeting held on 19 October 2019. In addition this assessment takes into account the latest development scheme plans (September 2020) and the Schedule of Further Information Required under Regulation 22 as requested by Cumbria County Council in June 2020, see paragraphs 1.24 and 1.25.

1.7 In line with our previous assessments, this report details baseline dust deposition levels at the site and comments on the likelihood of dust events occurring at surrounding receptor locations based on meteorological data for the site, as advised by an independent meteorological organisation. The assessment considers nuisance dust and the health impacts from the emission of fine dust particles PM_{10} and $PM_{2.5}$ based on the screening criteria presented by the IAQM, the assessment of nuisance dust within 400 metres of dust generating activity at hard rock quarries, and the assessment of PM_{10} within 1km of site operations.

1.8 The IQAM note that "a dust assessment should consider the concentration of dust particles suspended in the air (PM_{10}) that can potentially have effects on human health by considering the likelihood of PM_{10} exceeding the Air Quality Objectives", such an assessment is provided within Section 6 of this report. The assessment framework is based upon the University of Newcastle upon Tyne study into the health effects of mineral workings detailed within section 2.4 of this report.

1.9 There was concern at the public meeting that the assessment had not specifically addressed dust levels at Plumbland School. This is now detailed in Paragraphs 5.10 to 5.12. The assessment also details the liklihood of a dust event at High Close Farm. At the time the initial assessment was completed, Thomas Armstrong Limited owned High Close Farm located to the north-east of the application site and was therefore not considered dust sensitive.

1.10 Since then the Company has sold High Close Farm, together with some land to the north of the proposed development to a local person. The new owner intends to run an existing agricultural shed building company from the property and there will be storage of diggers with a small amount of fabrication, so the area immediately surrounding the farm house will have an industrial use.

1.11 The new owner was fully aware of the proposal to quarry and implement the dormant planning permission, but was keen to buy the property. The proposal has been in the public arena following the formal request to Cumbria County Council for a Scoping Opinion in April 2017.

1.12 As part of the sale and purchase agreement the new owner, being completely aware of the proposal, has formally and legally agreed that he will not object to the proposed application or to the ongoing operations. Also this covenant will apply to future owners.

1.13 The Land Registry Transfer Document TP1, Section 12.19 headed, Restrictive covenants by the transferee, states the following:

The Transferee covenants with the Transferor to observe and perform the restrictions specified below and it is agreed and declared that:

i) the benefit of the covenant and the restrictions are to be attached to and ensure for the benefit of each and every part of the Transferor's Retained Land and Minerals;

ii) the burden of this covenant and the restrictions is intended to bind and binds each and every part of the Property into whosoever hands it may come.

12.19.1 The particular restrictions are in clauses "c" and "e" set out below:

(c) not to object to any planning applications and not make any objections, claims or comments of any description on any application for planning permission including applications made in relation to any variations, approvals or submissions or any other applications)made by the Transferor, their agents or subcontractors or made on their behalf in respect of any part of the Transferor's Retained Land /or Minerals on or under the Transferor's Retained Land in relation to any use of the Transferor's Retained Land and /or Minerals on or under the Transferor's Retained Land for quarrying and/or associated activities (including but not limited to restoration infill or waste disposal) (for the avoidance of doubt this shall include but not be limited to any applications made with respect to Planning Permission No. CA49 and any subsequent correspondence arising from it or any appeal or public enquiry arising from any such application).

(e) not to object to , or bring any claims processing demands or actions in nuisance or similar claim against the Transferor or any agents, subcontractors, tenant or licensee of the same in relation to, the development or use of the Transferor's Retained Land and or/ the Minerals on or under the Transferor's Retained Land for the purposes of quarrying or associated activities (including but not limited to restoration, infill or waste disposal) but nothing in this clause shall limit the liability of the Transferor for loss of damage recklessly, wilfully or internationally caused to the Property or the Transferee.

1.14 Notwithstanding the above, this assessment takes into account that High Close Farm is now not in the ownership of the applicant. However the new owner is fully aware and accepting of the proposal as mentioned above.

1.15 The revised report addresses the fact that the proposed HGV traffic route has changed as detailed in section 3.5.

1.16 The revised assessment gives further details regarding the location of the dust deposition pads deployed at the site as shown in Figure 1.

1.17 The qualitative assessment method regarding the likelihood of dust deposition is in line with best practice guidance from the IAQM which states that "detailed dispersion modelling of dust impacts from minerals sites in the UK is extremely rare and is not generally recommended by the IAQM given the lack of accurate UK emissions data for this sector".

1.18 The baseline dust deposition levels were conducted during the spring and summer months at the locations identified on Figure 1.

1.19 The PM_{10} and $PM_{2.5}$ data utilised in the assessment is that obtained from the UK Air section of the DEFRA website. It is not anticipated that NOx will significantly impact on the local air quality as a result of the low number of vehicle movements associated with the site combined with the HGV route which fall below the screening criterion from the IAQM at which an air quality assessment would be required. All HGVs will turn south out of the site on the B5301 away from the settlement of Parsonby.

1.20 In terms of health impacts from particulate increase at adjacent receptor locations, the assessment of fine particulates (PM_{10} and $PM_{2.5}$), following the assessment procedure outlined by the IAQM and NPPG detailed within section 6 of this report concludes that the anticipated increase of fine particulate levels fall below the UK air quality objectives for these pollutants. In terms of respirable crystalline silica, only workplace exposure limits are set within EH40/2005 (Fourth Edition 2020) which are not applicable to the wider environment or public exposure.

1.21 Thomas Armstrong, however as part of its duty of care to its employees would be required to undertake workplace exposure monitoring to demonstrate compliance with the COSHH regulations which will include monitoring of respirable crystalline silica. It should be noted however that this requirement is not specifically required in terms of planning policy or in relation to the Air Quality Objectives or any other public health criterion.

1.22 However, airborne dust disperses rapidly with distance. Therefore, on the reasonable assumption that quarry staff will be exposed to far higher concentrations of mineral dust than neighbouring residents, it can be accepted that if concentrations of dust within the site are at safe levels, by definition they will be beyond its boundaries.

1.23 Dust emission will be controlled at source and mitigated utilising the proposed methods outlined in this report. The suggested dust mitigation measures have been proposed as conditions for the development from Allerdale Borough Council. The letter dated 14 July 2020 from Allerdale Borough Council Environmental Health Department is presented in Appendix 4, which confirms that the air quality assessment of 28 May 2020 satisfies the requirements of the comments in Richard Cain's email of 1 November 2019. A dust management plan could also be conditioned, which would detail the procedure for managing dust at the site and would identify a monitoring regime for the assessment of PM_{10}, $PM_{2.5}$ and deposited dust to demonstrate compliance with the relevant objectives.

1.24 The assessment has been reviewed following the development of the September 2020 site development plans. Finally, this Assessment has been revised accordingly in line with the Regulation 22 Schedule (Reg 22) of Further Information Required, request from Cumbria County Council, dated June 2020. In respect of air quality the Reg 22 document asked the following as set out in paragraphs 1.25 and 1.26. The required information is detailed below and the location within the report where the response can be found.

1.25 Further information and review required of air quality/dust assessments, including from the impacts of HGVs, [see paragraph 3.5.2] A review of baseline assessment should be included to take account of seasonal variations and prevailing weather conditions, [which is incorporated in the assessment]; the number, nature and proximity of local receptor (to include Plumbland School and High Close Farm [see Section 5 Discussion paragraphs 5.10 to 5.12 and 5.20 to 5.22 and 5.27]).

1.26 Consideration of cumulative effects from quarries (including Moota and Clints Quarry) and other developments, and levels of suspended particulate matter (including PM 10, PM 2.5, SO2, NO2 levels and any SiO2 levels) [see paragraphs 2.2.3 to 2.4.14 , Section 6, paragraphs 1.5 to 1.23 and paragraphs 5.29 and 6.22]. The further information must address all requirements as set out in the Scoping Opinion (June 2019 -Air Quality and Health sections) [all this has been done}.

2.0 EXISTING ENVIRONMENT

2.1 Introduction

Windspeed and Direction

2.1.1 The generation and dispersal of dust is highly dependent upon meteorological conditions prevalent at the time. The WeatherNet has advised that wind speed and direction data are recorded at Keswick, approximately 18 km south west of High Close Quarry. This data has been recommended for similar approved developments in the area. Observations of the wind speed and direction are recorded over a ten year period with some 87,599 hourly observations used to compile the relevant wind rose.

2.1.2 WeatherNet considers that the data recorded at Keswick over the period January 2007 to December 2016 would be representative of the conditions experienced in the vicinity of High Close Quarry. From our site inspection we consider that this data is not likely to be significantly affected by the site topography. An extract from the Keswick wind speed and direction data is presented in Appendix 1 as an annual wind rose.

Rainfall Data

2.1.3 An indication of the long term average annual number of dry days (i.e. less than 0.2 mm) for the quarry has also been taken from records collected at Keswick (Appendix 2) and indicates that there is an average of 102 days per year with rainfall less than 0.2 mm, i.e. about 28 % of the year.

2.2 Existing Air Quality

Deposited Dust

2.2.1 Existing levels of deposited dust will typically be of the order of 56 mg/m²/day (milligrams per square metre per day) annual median, for a general deposit in sensitive areas and town outskirts, MIRO February 2011. However, values vary daily, particularly during dry weather but also because of local industry. Median (50^{th} percentile) levels of 38 mg/m²/day for open country, and 90 mg/m²/day for commercial town centres are also given by that source. The table overleaf shows these and other dustfall rates.

Location	Median (50th percentile) mg/m²/day	90th percentile mg/m²/day	95th percentile mg/m²/day
Open Country	38	103	140
Sensitive areas and town outskirts	56	146	203
Commercial Town Centres	90	199	261

2.2.2 Within the area around the site the existing deposited dust levels are influenced mainly by farming activity. The area is considered to be open country.

PM_{10} and $PM_{2.5}$ Particulates

2.2.3 Particulate matter is generally categorised on the basis of the size of the particles. PM_{10} particles are those with a mean aerodynamic diameter less than 10 micrometres (microns), with the smaller $PM_{2.5}$ particles being defined as those with a mean aerodynamic diameter less than 2.5 microns.

2.2.4 Particulate matter is made up of a wide range of materials and arises from a variety of sources. Concentrations of particulate matter comprise primary particles emitted directly into the atmosphere from combustion sources and secondary particles formed by chemical reactions in the air. Particulate matter derives from both human activity and natural sources (such as sea spray and Saharan dust). In the UK the biggest human activity sources are stationary fuel combustion and transport.

2.2.5 As an indication of the likely level of PM_{10} and $PM_{2.5}$ particulates at the site, data has been accessed for the relevant 1km squares of the Automatic Urban and Rural Network (AURN). The PM levels for the Grid Squares which contain the closest sensitive receptors to the quarry are detailed. The data presented is for the years 2020 & 2030.

**Grid Square 313500, 538500:
Containing Parsonby Farm**

Year	PM_{10} Annual Mean $\mu g/m^3$	$PM_{2.5}$ Annual Mean $\mu g/m^3$
2020	7.4	4.7
2030	6.9	4.3

**Grid Square 314500, 538500:
Containing Plumbland C of E School**

Year	PM_{10} Annual Mean $\mu g/m^3$	$PM_{2.5}$ Annual Mean $\mu g/m^3$
2020	7.1	4.7
2030	6.7	4.3

**Grid Square 314500, 538500:
Containing The Muslins and Adam's Ghyll**

Year	PM_{10} Annual Mean $\mu g/m^3$	$PM_{2.5}$ Annual Mean $\mu g/m^3$
2020	7.1	4.7
2030	6.7	4.3

**Grid Square 313500, 537500:
Containing Eweclose**

Year	PM_{10} Annual Mean $\mu g/m^3$	$PM_{2.5}$ Annual Mean $\mu g/m^3$
2020	7.5	4.7
2030	7.1	4.3

Grid Square 314500, 537500:
Containing High Close Farm

Year	PM_{10} Annual Mean $\mu g/m^3$	$PM_{2.5}$ Annual Mean $\mu g/m^3$
2020	7.3	4.6
2030	6.8	4.3

2.2.6 Within the surrounding area of High Close Quarry, the PM_{10} and $PM_{2.5}$ levels would be influenced by traffic movements on the local road network. Additionally global PM_{10} and $PM_{2.5}$ emissions will also have a considerable influence.

2.3 Air Quality Standards

Deposited Dust

2.3.1 Dust in the community is normally perceived as an accumulated deposit on surfaces such as washing, window ledges, paintwork and other light coloured horizontal surfaces, e.g. car roofs. When the rate of accumulation is sufficiently rapid to cause noticeable fouling, discoloration or staining (and thus decrease the periods between cleaning) then the dust is generally considered to be a nuisance. The point at which an individual makes a complaint regarding dust is highly subjective.

2.3.2 In the UK and Europe there are no definitive standards for deposited particulates, however, criteria and guidelines have been developed in many other countries. Studies undertaken in Australia, for example, have resulted in the adoption of a deposited dust criteria linked to the onset of loss of amenity of about 133 $mg/m^2/day$, averaged over one month. In the UK, long term deposited dust nuisance criteria have been suggested for urban/semi-rural areas at, typically 200 $mg/m^2/day$, averaged over a monthly period.

2.3.3 Custom and practise at quarries, coal, construction and demolition sites have used the figure of 200 $mg/m^2/day$ as a nuisance threshold for sites in the UK.

PM_{10} and $PM_{2.5}$ Particulates

2.3.4 The UK National Air Quality Strategy (NAQS) defines air quality standards for eight major pollutants, one of which is for PM_{10} and sets objectives for reductions in the concentrations of those pollutants to be achieved by 2005.

2.3.5 The original PM_{10} standard of 50 µg/m³ as a 24 hour running mean was to be achieved with no more than 4 exceedances per year by the end of 2005. This was considered to be an unrealistic target and as such it was replaced by the limits within the EU Daughter Directive on Air Quality which set a limit of 50 µg/m³ as a daily mean to be achieved by 31 December 2004 and maintained thereafter, with no more than 35 exceedances and an annual average of 40 µg/m³.

2.3.6 Under the 2010 Air Quality Standard Regulations, pollutants of particle size $PM_{2.5}$ should be limited to an annual concentration of 25 µg/m³ from the year 2015 and 20 µg/m³ from the year 2020. The Air Quality Standards Regulations 2010 sets out limit and target values for concentrations of certain pollutants in air. The Environment (Miscellaneous Amendments (EU Exit Regulations 2020 updated the 2010 regulations to set a new limit value for PM2.5 of 20 µg/m³.

2.4 Health Impact Studies

2.4.1 Medical studies have consistently failed to find any link between dust arising from mineral working and public health. A local doctor who claimed that a nearby site produced demonstrable adverse medical effects upon his patients presented evidence to the Derlwyn Public Inquiry in South Wales. However, that evidence has since been discredited and shown, as an epidemiological study to be fundamentally flawed (British Medical Journal 305, 1992).

2.4.2 In 1992 the Institute of Occupational Medicine (IOM) concluded a three-year epidemiological study of the respiratory health of some one thousand two hundred and forty nine opencast mine employees working over nine sites selected by the IOM (Institute of Occupational Medicine Ltd 1992).

2.4.3 The main conclusions of that study were that dust exposures were low for most occupational occurrences and that neither asthma nor chronic bronchitis is related to exposure to dust in any part of opencast workings. It is only for those workers exposed for 10 years or more in the dustiest of opencast jobs that a small risk of pneumoconiosis was demonstrated.

2.4.4 The Health and Safety Executive have set the occupational exposure limit for dust at 10 mg/m³ as an 8 hour time weighted average. As previously mentioned such a figure may have significance within a site if workers are immediately adjacent to a particular operation prone to high dust emissions. However, due to dilution and dispersion it is extremely unlikely that any sensitive property around a site would ever experience concentrations of dust as high as this, with environmental dust levels some 100 times less being the norm.

2.4.5 In 1999 the then DETR published the results of a relevant research project by the University of Newcastle upon Tyne under the title “Do particulates from opencast coal mining impair children’s respiratory health?”

2.4.6 The Committee on the Medical Effects of Air Pollutants considered the content of this study, finding that is was "…of a high standard".

2.4.7 The Committee agreed with the findings of the authors of the report that:

i) Opencast coal mining was associated with a small increase in the mean concentration of airborne particle measured as PM_{10} in areas close to opencast sites. This was due to an increased concentration of shale.

ii) The respiratory health of children living in communities close to opencast coal sites was very similar to that of children living in communities distant from such sites.

2.4.8 Overall, the number of consultations made to general practitioners was similar for children who lived close to opencast sites compared to those who did not.

2.4.9 The Committee noted that the increase in particle concentrations close to opencast sites was not due to the release of coal particles but was more likely due to earth moving and excavation. Such levels of exposure to these materials, as may occur in local communities as a result of any opencast mining, are most unlikely to have any detectable effects on health.

2.4.10 They concluded that from what is known of the long term effects of coal mining on the health of opencast coal miners, that it is most unlikely that opencast sites would have any long term effects on the health of local communities.

2.4.11 The study noted that the differences between opencast areas and the control communities studied during the research was some 2.0 $\mu g/m^3$ in terms of the gravimetric mean of daily differences in measured PM_{10} values.

2.4.12 Of significance, however, was their finding that the differences between opencast and control communities were not found to be greater under conditions when the contribution of site related PM_{10} dust had been expected to be raised. In such circumstances as when the wind was blowing from the site to the community monitor or during permitted site working hours.

2.4.13 Further guidance with regard to the assessment of PM_{10} is given within the Planning Practice Guidance documentation to the National Planning Policy Framework.

2.4.14 The general basis of this guidance is that dust should as far as possible be controlled, mitigated or removed at source. The document further confirms, with minor refinements, the assessment methodology of the University of Newcastle upon Tyne study.

2.5 Significance of Existing Air Quality

2.5.1 The comparison between existing levels of deposited dust is shown in the table below. The monitoring locations are displayed in Figure 1. The dust levels were monitored using sticky pads with analysis in effective area coverage per day. The monitoring period selected is seen as a worst case scenario with warm and dry conditions, compared to the autumn/winter months where dust will more likely be suppressed given the increase in rainfall and damp conditions. This has been calculated into mg/m^2/day for comparison with nuisance criterion of 200 mg/m^2/day.

Measured Air Quality – 19.04.17 – 31.05.17

Location	Deposited Dust (Approximation) mg/m^2/day
A	20
B	60
C	42

2.5.2 The dust results are inclusive of the cumulative effects of local activities in the area which include road traffic and farming activities.

2.5.3 During the LAQM review and assessment process the local authority in which the extension area falls; Allerdale Borough Council has not designated any Air Quality Management Areas in relation to the National Air Quality Objective pollutants, which include PM_{10}, $PM_{2.5}$ and NO_2, an indication of the good air quality within the Borough.

2.5.4 Allerdale Borough Council regulated 32 Part B and 3 Part 2A processes during 2018, as reported reported in the Local Authorities 2019 Air Quality Annual Status Report (ASR). Many mineral sites will have a Part B Environmental Permit. The comment in the 2019 ASR in respect to Allerdale's statutory duty to regulate such sites was that *"No enforcement action was required during 2018 and no unexpected air pollution incidents have been recorded".* There is no reason to believe that operations at High Close Quarry will require enforcement action or cause an air pollution incident.

3.0 POTENTIAL EMISSIONS

3.1 Introduction

3.1.1 The operations involved in the site preparation, mineral extraction, mineral processing and movement of aggregate have the potential to generate dust emissions the affects of which will be largely determined by on-site control measures.

3.2 Soil Stripping

3.2.1 One of the first processes to be conducted at the site would be a process of phased soil stripping and any associated bund formation work. The location of a potential vegetated screening mound and overburden storage area are identified on the plans accompanying this application. Bund formations shall be seeded and vegetated as soon as is practicable in order to prevent the potential for wind blow from this source. Overburden stores will also be seeded.

3.2.2 Soil stripping and bund formation shall be conducted in such a way as to minimise the handling of material. Drop heights will be minimised when handling overburden to prevent dust generation.

3.2.3 A site speed limit of 10 mph will be implemented within the quarry development area to minimise dust generation. All mobile plant utilised as part of these operations will be well maintained and will observe the site speed limit and thus the generation of dust from this source shall be minimised.

3.3 Mineral Extraction and Transportation Operations

3.3.1 The extraction of mineral will be conducted via the use of controlled drilling and blasting techniques. The drilling of shot holes would be conducted utilising a drill rig with integrated dust suppression.

3.3.2 Following blasting operations the mineral will be transported to a mobile primary crusher located at the quarry face. The aggregate will then be transported to a mineral storage and processing area where the aggregate will be processed via further crushing and screening and stockpiled before being transported off site.

3.3.3 It is anticipated that an enclosed conveyor system will be used for mineral transportation from the quarry face, a measure which will minimise the number of mobile plant movements across the site and the associated potential for dust emission. The conveyor system will be well maintained with any spillages promptly dealt with. Transfer points on the conveyor system will be enclosed thus minimising the potential for the wind blow of dust from this source.

3.3.4 Prior to the installation of the mineral conveyor system, a period of transportation of mineral via dump truck may occur.

3.3.5 Drop heights will be minimised from the excavator bucket to the feed hoppers and to the dump truck as required. An on site speed limit of 10 mph will be adopted and the use of a water bowser as required will help to minimise dust emissions from the operation.

3.3.6 Internal haul roads will consist of compacted material and shall be regularly maintained by grading in order to minimise dust generation.

3.3.7 Mobile plant exhausts and cooling fans will be discharged away from the ground to prevent dust mobilisation.

3.3.8 All mobile plant will be regularly maintained.

3.4 Mineral Processing Plant

3.4.1 The processing units will comprise a mobile primary crushing unit at the quarry face. A secondary crusher unit and screens will operate in the mineral storage and processing area. The mineral processing units will, where practicable, be located within sheltered positions and water will be used as required in order to minimise dust emissions.

3.4.2 Mineral which has been processed, when possible will be located in a position which is shielded from the prevailing wind.

3.4.3 The ground surface in the quarry void and the mineral processing area will be regularly graded with water applied via a water bowser as required. A site speed limit of 10 mph will apply around the processing area.

3.5 Off-site Transportation

3.5.1 The loading of aggregate to HGVs for off site transportation will be conducted with consideration given to minimising the drop heights from the loader shovel bucket to the HGVs. All lorries leaving site with aggregate will be sheeted and will be required to pass through the site wheel cleansing facilities. The site access road will be paved to minimise the potential for dust generation from HGV movements, HGVs will be required to comply with the site speed limit of 10 mph.

3.5.2 The proposed haulage route for HGV's along public roads has been revised and no HGV's transporting aggregates will travel north on the B5301 through Parsonby. All this traffic leaving or arriving at the proposed quarry will do so via the A595. This represents an improvement in the potential for the emissions of NOx from HGVs emanating from the quarry which was of local concern.

3.5.3 A road sweeper will be deployed as required on the local road network.

3.6 Potential Emission Magnitude

3.6.1 The Institute of Air Quality Management document " Guidance on the Assessment of Mineral Dust impacts for planning, 2016" suggests that the magnitude of potential dust emission should be classified on a scale of impact as small, medium or large based upon the judgement of the assessor. In determining the potential emissions of importance to this application, the following sources are considered:

- Site Preparation
- Mineral Extraction
- Materials Handling
- On site Transportation
- Mineral Processing
- Stockpiles/Exposed Surfaces
- Off-Site Transportation

Site Preparation

3.6.2 Short term operations at the site will consist of soil stripping and bund construction/removal, with the largest areas of simultaneous working in the order of 17 ha. The IAQM suggests such a scale of operations may have a large potential for dust emission.

3.6.3 Bunds around the site will be 4 metres in height, which the IAQM assesses as having a small dust potential. The anticipated number of mobile plant items simultaneously active during site preparation works will consist of a backacter a dozer and a dump truck, the number of mobile plant items is classed as a small potential impact by the IAQM.

3.6.4 The overall scale of potential emission is therefore classed as medium for site preparation.

Mineral Extraction

3.6.5 The maximum size of the mineral extraction area to be worked at any one time is in the order of 5 ha. The IAQM classes such scale of operations as having a small dust raising potential. Drilling and blasting techniques will be utilised. The mineral extraction rate is anticipated to be between 150,000 to 250,000 tonnes maximum per annum which the IAQM assesses as a low mineral extraction rate with a small dust potential. The limestone mineral to be extracted has a relatively high dust raising potential which will be mitigated through the use of water as required.

3.6.6 The overall scale of potential emission is therefore considered to be medium for mineral extraction operations.

Materials Handling and On-site Transportation

3.6.7 The IAQM suggest that >10 loading plant, transferring material of a high dust potential on poorly surfaced ground should be classified as a large potential dust impact.

3.6.8 The mineral to be extracted at the site has the potential to involve less than 5 plant items operating simultaneously within 100 metres of the site boundary. Mineral and overburden will be transported via dump truck as required over a consolidated bare surface and will comply with the site speed limit of 10 mph. However it is anticipated that for the majority of the quarry operation that a conveyor system will transport mineral to the storage and processing area. The impact from materials handling and on-site transportation is therefore judged to be of a small scale in terms of dust raising potential.

Mineral Processing Plant/Stockpiles Exposed Surfaces

3.6.9 The mineral processing plant at High Close will consist of a mobile primary crusher located at the quarry face and a mobile secondary crusher and screening unit located within the storage and processing area. The anticipated throughput of the plant will be between 150,000 and 250,000 tonnes per annum, classed as a small dust raising potential. The mineral to be processed has a high dust raising potential, although this will be mitigated by the use of water as required. Mineral processing is therefore considered to have a small dust raising potential.

3.6.10 The area of the quarry allocated for material storage is approximately 4.5 ha located within 50 metres of the site boundary and a quarry production rate of <250,000 tpa, the IAQM classes the above as having the potential for a medium scale of dust raising potential, however the use of dust mitigation techniques including minimisation of drop heights, a site speed limit and the use of water as required combine such that the scale of dust raising impact is considered to be small.

Off-site Transportation

3.6.11 The maximum anticipated number of HGV movements per day is 40 vehicles entering and 40 exiting the site over a paved access road with effective HGV cleaning facilities. According to the IAQM classification, the dust raising potential of off-site transportation is classed to be small.

Residual Source Emission Classification

Activity	Residual Source Emissions
Site Preparation	Medium
Mineral Extraction	Medium
Materials Handling and on-site Transportation	Small
Mineral Processing Plant and Stockpiles/Exposed Surfaces	Small
Off-site Transportation	Small

4.0 CLIMATIC CONDITIONS

4.1 The frequency of use and the effectiveness of the control measures outlined in Appendix 3 will largely depend upon climatic conditions together with the separation distances involved between any potential dust source and sensitive locations.

4.2 The highest potential for dust dispersal and deposition occurs on dry windy days and the risk of dust deposition at a particular location is determined by the frequency of these dry winds blowing towards them from a dust generating activity.

4.3 In the guidance 'The Environmental Effects of Dust from Surface Mineral Workings' published in 1995 by the DoE (now part of DEFRA) together with guidance in the former MPS2, it is generally accepted that wind blow of dust does not occur on days when rainfall is above 0.2mm.

4.4 The meteorological data from Keswick has been analysed in order to quantify the number of dry working days in which the wind direction is in a particular sector.

4.5 Information provided by the Met Office as monitored at Keswick is detailed below:-

Wind Direction	Frequency of Occurrence %
North	2.0
North North East	2.9
East North East	4.8
East	12.7
East South East	11.7
South South East	8.7
South	5.7
South South West	5.5
West South West	12.4
West	15.5
West North West	11.9
North North West	6.2
Calm/variable	0.0

Rainfall less than 0.2 mm

102 days per year (Appendix 2).

4.6 The information adapted to allow for working days only, i.e. 5½ days per week, 47 weeks per year, is 72 working days per year with rainfall less than 0.2mm.

4.7 Combined with the prevailing wind directions, the number of dry working days each year can be represented as follows:-

Wind Direction	No. of Dry Working Days
North	1.4
North North East	2.1
East North East	3.5
East	9.1
East South East	8.4
South South East	6.3
South	4.1
South South West	4.0
West South West	8.9
West	11.2
West North West	8.6
North North West	4.5
Calm/variable	0.0

4.8 Considering that dust is not likely to be carried by winds of less than 5.6 ms^{-1} (i.e. less than 11 knots), an assessment of the likelihood of a dust occurrence is presented below:-

Wind Direction	No. of Dry Windy Working Days	Dry Windy Working Days as % of the total Number of Dry Working Days per Year (72)
North	0.4	0.6
North North East	0.9	1.2
East North East	0.8	1.1
East	3.5	4.8
East South East	3.2	4.5
South South East	2.1	2.9
South	1.4	2.0
South South West	2.1	2.9
West South West	6.6	9.1
West	5.9	8.2
West North West	2.0	2.8
North North West	0.6	0.9

4.9 This value of 5.6 ms^{-1} derives from the Beaufort Wind Scale and is very much in line with the value of 5.4 ms^{-1} as used by the United States Environmental Protection Agency in their dust emission calculations. The value is also below the 5.8 ms^{-1} stated within guidance from MIRO and the Department of the Environment for the initiation of dust emission for disturbed pebbly soils.

5.0 DISCUSSION

5.1 The proposed methods of dust suppression are based on Vibrock's experience of handling potentially dusty materials over many years in a wide variety of situations. These tried and tested methods of dust suppression have been successfully used at numerous minerals sites. The proposed dust control measures are recognised as industry best practice and are summarised in Appendix 3.

5.2 A dust event will only occur if the necessary conditions are present. It is necessary to have a fine material available which is able to be picked up, carried and then deposited by the wind. Such materials are more readily available if dry and physically disturbed. Thus not all site operations are dusty because of the lack of physical disturbance. There must also be a wind of sufficient strength to transport fine particles, and for a particular property to be at risk the wind must blow in that particular direction from the source. The critical wind speed at which a particle becomes airborne depends on many factors including particle size, shape and density. For most mineral dusts the critical wind speed is about 5.6 ms^{-1} (12 mph - 11kts - Force 4 on Beaufort Scale).

5.3 For a dust event to occur there must also be a failure of dust control measures. Particles greater than 30µm make up the greatest proportion of dust emitted from mineral processing and largely deposit within 100 metres of sources. Particles between 10 and 30µm are likely to travel from 250 to 400 metres, while sub 10µm particles, which make up a small proportion of dust emitted from most mineral processing operations, may travel up to 1km from sources.

5.4 In considering the climatic conditions, it is clear the winds will predominate from the south west and westerly quadrants with an analysis of the number of dry windy working days giving a maximum of some 14.6 such days likely in a south west and westerly direction in any one year.

5.5 The IAQM Guidance on the Assessment of Mineral Dust Impacts for Planning presents the following categorisation of frequency of potentially dusty winds and categorises receptor distance from source as distant, intermediate or close as displayed below.

Categorisation of Frequency of Potentially Dusty Winds

Frequency Category	Criteria
Infrequent	Frequency of winds (>5m/s) from the direction of the dust source on dry days are less than 5%
Moderately Frequent	Frequency of winds (>5m/s) from the direction of the dust source on dry days are between 5% and 12%
Frequent	Frequency of winds (>5m/s) from the direction of the dust source on dry days are between 12% and 20%
Very Frequent	Frequency of winds (>5m/s) from the direction of the dust source on dry days are greater than 20%

Category	Criteria
Distant	Receptor is between 200 and 400m from dust source
Intermediate	Receptor is between 100 and 200m from dust source
Close	Receptor is less than 100m from the dust source

5.6 The assessment locations are identified on Figure 1.

Parsonby Farm

5.7 Parsonby Farm is representative of sensitive receptors located to the west of Parsonby. The closest approach separation distance to site operations is in excess of 450 metres to the south of the property.

5.8 Winds from the south and south east would blow from the site towards the sensitive receptor.

5.9 A total of 6.7 dry windy working days are calculated from the above sectors, representing 9.4% of all dry windy working days. Parsonby Farm and adjacent receptors are therefore classed as distant from the source of dust and with the potential for dusty winds classed as moderately frequent.

Plumbland C of E School

5.10 Plumbland C of E School is representative of a sensitive receptor located to the north east of Parsonby. The closest approach separation distance to site operations is in excess of 600 metres to the south of the school.

5.11 Winds from the south and south east would blow from the site towards the sensitive receptor.

5.12 A total of 6.7 dry windy working days are calculated from the above quadrants, representing 9.4% of all dry windy working days. Plumbland C of E School and adjacent receptors are therefore classed as distant from the source of dust and with the potential for dusty winds classed as moderately frequent.

The Muslins

5.13 The sensitive receptors located on The Muslins are located in excess of 500 metres from the closest of operations in the northern section of the site.

5.14 Winds from the south and the south south west would blow from the closest of workings towards the properties. The calculated number of dry windy working days is 1.4 days from the south and 2.1 days from the south south west per annum, giving a total of 4.9% of the total number of dry working days. The number of dry windy working days are therefore classed as moderately frequent with the distance between potential dust sources and the receptors classed as distant.

Adam's Ghyll

5.15 The sensitive receptor of Adam's Ghyll is located to the north east of quarry operations at a separation distance from the closest of workings in the order of 400 metres, classed as distant from the dust source.

5.16 The number of dry windy working days when wind of sufficient strength blows from the south west towards the property is calculated to be 8.7 days per annum, which gives a total of 12 % of the total number of dry working days, classed as moderately frequent.

Eweclose

5.17 Eweclose is a sensitive property located some 800 metres to the west of the closest of site operations at High Close Quarry.

5.18 The number of dry windy working days when the wind blows from the east north east, east and east south east is 0.8 days, 3.5 days and 3.2 days per annum respectively which together represents 10.4% of the total number of dry working days.

5.19 The separation distance is classed as distant with the frequency of dusty winds classed as moderately frequent.

High Close Farm

5.20 The receptor of High Close Farm has recently been purchased and the new owner is fully aware of the development proposals. High Close Farm is located some 200 metres to the north east of the closest of mineral extraction operations and some 200 metres to the north of the proposed site storage and processing area at High Close Quarry.

5.21 The number of dry windy working days when the wind blows from the south south east, south and south west quadrants is 12.2 days per annum respectively which together represents 16.9% of the total number of dry working days.

5.22 The separation distance is classed as distant with the frequency of dusty winds classed as frequent.

Pathway Effectiveness

		Frequency of potentially dusty winds			
		Infrequent	**Moderately frequent**	**Frequent**	**Very frequent**
Receptor Distance Category	**Close**	Ineffective	Moderately Effective	Highly Effective	Highly Effective
	Intermediate	Ineffective	Moderately Effective	Moderately Effective	Highly Effective
	Distant	Ineffective	Ineffective	Moderately Effective	Moderately Effective

5.23 In order to determine pathway effectiveness from the IAQM guidance, the receptor distance category and frequency of potentially dusty winds are combined, the results of which are presented for each receptor location below. The receptors of Parsonby Farm, The Muslins and Eweclose are all in excess of 400 metres from the closest approach of operations. The IAQM guidance states that dust deposition impacts from hard rock quarries would not be expected at in excess of 400 metres; therefore the pathway effectiveness at these receptors is classed as ineffective.

Receptor	Pathway Effectiveness
Parsonby Farm	Ineffective*
Plumbland C of E School	Ineffective*
The Muslins	Ineffective*

Receptor	Pathway Effectiveness
Adam's Ghyll	Ineffective
Eweclose	Ineffective*
High Close Farm	Moderately Effective

* In excess of the 400m distant criterion

5.24 An estimation of dust risk is established for each location based on the pathway effectiveness of dust transmission and the worst case categorisation of residual dust source emission as detailed within Section 3.

Estimation of Dust Impact Risk

		Residual Source Emissions		
		Small	**Medium**	**Large**
Pathway Effectiveness	**Highly effective pathway**	Low Risk	Medium Risk	High Risk
	Moderately effective pathway	Negligible Risk	Low Risk	Medium Risk
	Ineffective pathway	Negligible Risk	Negligible Risk	Low Risk

Receptor	Estimation of Dust Impact Risk
Parsonby Farm	Negligible Risk
Plumbland C of E School	Negligible Risk
The Muslins	Negligible Risk
Adam's Ghyll	Negligible Risk
Eweclose	Negligible Risk
High Close Farm	Low Risk

5.25 For the purpose of identifying receptor sensitivity, the IAQM 2016 guidance suggests that sensitive dwellings should be classed as a high sensitivity receptor.

Descriptors for magnitude of dust effects

		Receptor Sensitivity		
		Low	**Medium**	**High**
Dust Impact Risk	**High Risk**	Slight Adverse Effect	Moderate Adverse Effect	Substantial Adverse Effect
	Medium Risk	Negligible Effect	Slight Adverse Effect	Moderate Adverse Effect
	Low Risk	Negligible Effect	Negligible Effect	Slight Adverse Effect
	Negligible Risk	Negligible Effect	Negligible Effect	Negligible Effect

5.26 An assessment of the magnitude of dust effect is presented for each of the receptor locations below:

Receptor	Magnitude of Dust Effect
Parsonby Farm	Negligible Effect
Plumbland C of E School	Negligible Effect
The Muslins	Negligible Effect
Adam's Ghyll	Negligible Effect
Eweclose	Negligible Effect
High Close Farm	Slight Adverse Effect

General

5.27 As shown above, at five of the six receptors considered, the result of the IAQM assessment is a negligible effect. At High Close Farm the assessment concluded that there would be a slight adverse effect.

5.28 Overall the development is therefore considered to be not significant in terms of disamenity dust.

5.29 In terms of cumulative effects with surrounding quarry operations, as previously detailed deposited dust impacts from hard rock quarry operations are considered ineffective at in excess of 400m. Given the separation distances from neighbouring quarry operations to the receptor locations and the variation in directionality of dust source the likelihood of cumulative dust impacts is considered to be low.

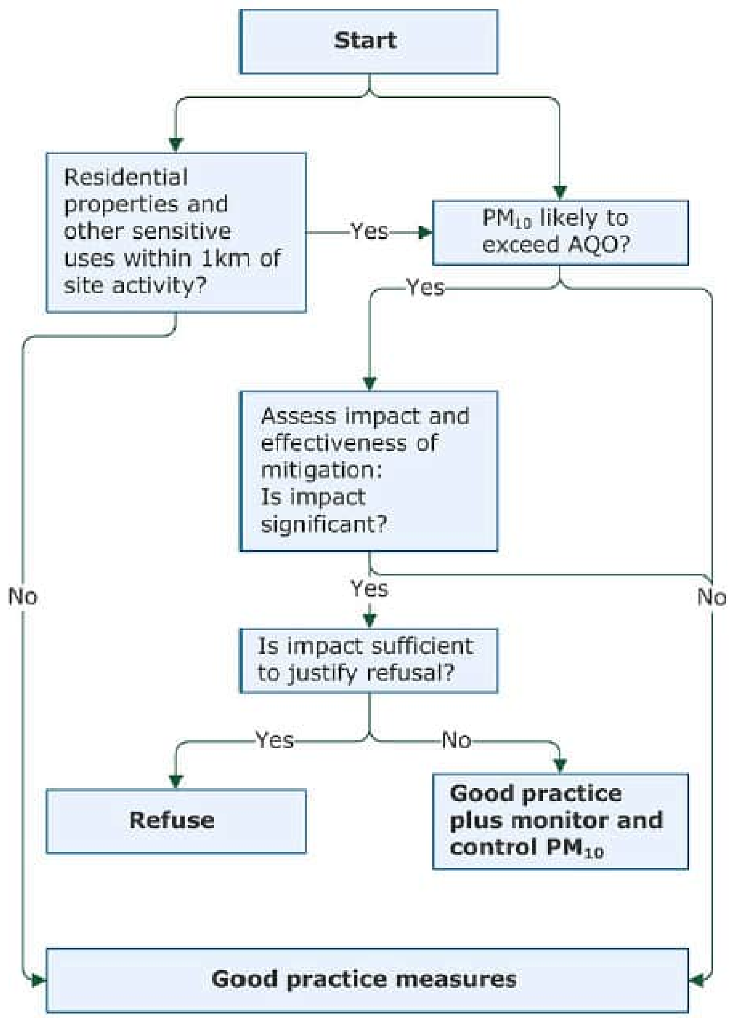
5.30 When conditions for dry windy working days do occur, the implementation of the dust suppression measures discussed in Section 3 and Appendix 3, will ensure that dust emissions are minimised. The use of such best practice measures, which have been implemented at mineral extraction sites throughout the United Kingdom, suggest that such measures will be effective.

6.0 PM_{10} ASSESSMENT

6.1 The 1999 DETR publication "Do particulates from opencast coal mining impair children's respiratory health?" recommends an assessment framework with respect to PM_{10} particulates.

6.2 The framework takes a step by step approach to PM_{10} looking at various factors in time via a scheme of straightforward questions set out in a "Proposed Site Assessment Flowchart". If the site is not likely to have a significant impact then best practice measures are recommended. If, however, its impact is significant, either a refusal should follow or additional monitoring and control.

6.3 The Planning Practice Guidance to the National Planning Policy Framework contains an amended version of the assessment framework (shown below).



6.4 To follow the framework the first step is to assess whether the site has a community or particularly sensitive users / premises within 1000 metres of the site boundary.

6.5 The second step is then to assess whether the extra burden of PM_{10} particulates from the site is likely to exceed the National Air Quality Objectives (AQO).

Summary of Air Quality Standards for the protection of human health

PM fraction	Value ($\mu g/m^3$)	Description of Standard
PM_{10}	50	24 hour mean not to be exceeded more than 35 times a calendar year
	40	Annual Mean
$PM_{2.5}$	20	Annual Mean

6.6 To undertake this assessment it is recommended that Automatic Urban and Rural Network (AURN) data be accessed.

6.7 If the AURN data indicates that the additional load attributable to site operations, to be taken as 1 $\mu g/m^3$ for the scope of this assessment, as discussed below, would bring the area above the AQO, then this would indicate that there may be a need for monitoring and control mechanisms. These would be required to be put into place in order to reduce the potential to create PM_{10} dust from the site on those days that exceed the standard.

6.8 If the AURN data indicates that the additional load attributable to site operations alone of 1 $\mu g/m^3$ would not cause any breach of the AQO, this would indicate that there would be no justification for any additional monitoring and controls over and above best practice measures.

6.9 The Air Quality Strategy for England, Scotland, Wales and Northern Ireland, 2003 suggests that quarrying and construction work are thought to account for less than 1 µg/m³ of PM_{10} levels. It could therefore be considered that a loading of 1 µg/m³ is a worst case calculation. The Newcastle Study discussed within section 2 of this report was based upon an assessment of opencast coal operations and considered a loading of 2 µg/m³ as a process contribution. Opencast coal sites in general move far greater volumes of overburden and have a larger plant compliment than many sand and gravel and hard rock quarry operations. This lower dust generating potential for other types of mineral sites is acknowledged in the IAQM Minerals Dust Guidance.

6.10 This study has accessed air quality data from the DEFRA website for the relevant Grid Squares which contain the closest sensitive receptors.

Grid Square 313500, 538500:
Containing Parsonby Farm

Year	Projected PM_{10} Burden	
	Number of Exceedances of 50 µg/m³	Annual Mean µg/m³
2020	<1	8.4
2030	<1	7.9

6.11 For Grid Square 313500, 538500 the highest annual mean when combined with a site attributable load of 1 µg/m³ is for the year 2020 and gives a projected burden of 8.4 µg/m³. Such an annual mean is calculated to produce <1 daily exceedances of 50 µg/m³.

Grid Square 314500, 538500:
Containing The Muslins and Adam's Ghyll

Year	Projected PM_{10} Burden	
	Number of Exceedances of 50 µg/m³	Annual Mean µg/m³
2020	<1	8.1
2030	<1	7.7

6.12 For Grid Square 314500, 538500 the highest annual mean when combined with the site attributable load of 1 µg/m³ is for the year 2020 and gives a projected burden of 8.1 µg/m³. Such an annual mean is calculated to produce <1 daily exceedance of 50 µg/m³.

Grid Square 314500, 538500:
Plumbland C of E School

Year	Projected PM_{10} Burden	
	Number of Exceedances of 50 µg/m³	Annual Mean µg/m³
2020	<1	8.1
2030	<1	7.7

6.13 For Grid Square 314500, 538500 the highest annual mean when combined with the site attributable load of 1 µg/m³ is for the year 2020 and gives a projected burden of 8.1 µg/m³. Such an annual mean is calculated to produce <1 daily exceedance of 50 µg/m³.

Grid Square 313500, 537500:
Containing Eweclose

Year	Projected PM_{10} Burden	
	Number of Exceedances of 50 µg/m³	Annual Mean µg/m³
2020	<1	8.5
2030	<1	8.1

6.14 For Grid Square 313500, 537500 the highest annual mean when combined with the site attributable load of 1 µg/m³ is for the year 2020 and gives a projected burden of 8.5 µg/m³. Such an annual mean is calculated to produce <1 daily exceedance of 50 µg/m³.

Grid Square 314500, 537500:
Containing High Close Farm

Year	Projected PM_{10} Burden	
	Number of Exceedances of 50 µg/m³	Annual Mean µg/m³
2020	<1	8.3
2030	<1	7.8

6.15 For Grid Square 314500, 537500 the highest annual mean when combined with the site attributable load of 1 µg/m³ is for the year 2020 and gives a projected burden of 8.3 µg/m³. Such an annual mean is calculated to produce <1 daily exceedance of 50 µg/m³.

6.16 Hence mineral extraction operations at High Close Quarry would satisfy the UK Air Quality Objectives for PM_{10} of no more than 35 exceedances per year of a 24 hour mean of 50µg/m³ and an annual mean of 40 µg/m³.

6.17 This procedure clearly indicates that the PM_{10} from this proposal is not likely to exceed the Air Quality Objectives and it is considered that the best practice measures proposed for dust control are appropriate and in proportion to the potential for dust emission.

6.18 As previously noted within this report, sub 10µm particles, which make up a small proportion of dust emitted from most mineral operations, may travel up to 1km from sources. Of the total PM_{10} dust fraction there will be a percentage of the smaller $PM_{2.5}$ particulate matter.

6.19 In the May 2016 publication by the Institute of Air Quality Management "Guidance on the Assessment of Mineral Dust Impacts for Planning" it is stated that:

"The other potential air quality impact is the increase in ambient suspended particulate matter (PM) concentrations local to the site. As noted earlier, the PM_{10} fraction is relevant to health outcomes. For quarries most of this suspended dust will be in the coarse sub-fraction ($PM_{2.5-10}$), rather than in the fine ($PM_{2.5}$) fraction."

6.20 On the basis of the above comment and the nationally derived ratio of $PM_{2.5}/PM_{10}$; 0.7, it is considered an additional burden of 0.5 μgm^{-3} $PM_{2.5}$ to the annual mean would represent a worst case.

6.21 The application of a 0.5 µg/m³ loading to the highest $PM_{2.5}$ concentration considered in this assessment of 4.7 µg/m³ for the year 2020 gives a projected $PM_{2.5}$ burden with the addition of quarry operations of 5.2 µg/m³ for the Grid Squares containing Parsonby Farm, Plumbland C of E School, The Muslins, Adam's Ghyll and Eweclose. The worst case projected concentration therefore complies with the $PM_{2.5}$ annual mean criterion of 20 µg/m³.

6.22 With regard to cumulative impacts, the data utilised in the assessment from the AURN takes into account the existing particulate concentrations at the assessment locations and therefore from neighbouring sources.

6.23 Upon commencement of mineral extraction operations, any increase in the annual mean concentration of PM_{10} and $PM_{2.5}$ would not exceed the Air Quality Objectives.

7.0 DUST MANAGEMENT

7.1 The table below presents an assessment of dust effects in accordance with the IAQM Guidance on the Assessment of Mineral Dust Impacts for Planning.

Magnitude of Dust Effect

Receptor	Location Relative to Dust Source	Worst Case Residual Source Emissions	Pathway Effectiveness	Dust Impact Risk	Receptor Sensitivity	Magnitude of Dust Effect
Parsonby Farm	>450 m to the north	Medium	Ineffective	Negligible Risk	High	Negligible Effect
Plumbland C of E School	>600 m to the north	Medium	Ineffective	Negligible Risk	High	Negligible Effect
The Muslins	<500 m to the north	Medium	Ineffective	Negligible Risk	High	Negligible Effect
Adams's Ghyll	400 m to the north east	Medium	Ineffective	Negligible Risk	High	Negligible Effect
Eweclose	800 m to the west	Medium	Ineffective	Negligible Risk	High	Negligible Effect
High Close Farm	200m to the North and North East	Medium	Moderately Effective	Low Risk	High	Slight Adverse Effect

7.2 As shown above, the impact on air quality from potential dust emissions is expected, in all but one case is expected to be negligible. At High Close Farm, which has been recently purchased with the occupier fully aware of the proposals, a Slight Adverse Effect is calculated. The following measures will be taken to ensure that the dust control measures identified in Section 3.0 and Appendix 3 are effectively implemented. The implementation of appropriate dust control will effectively mitigate any potential dust impact.

7.3 The quarry operator will comply with any conditions which may be specified in the planning conditions imposed by the Mineral Planning Authority relating to dust. The operator will refer to the planning conditions and determine an appropriate response, taking into account current and forecast weather conditions.

7.4 All site personnel shall be trained as to the potential sources and effective mitigation of dust.

7.5 Regular visual inspections will be conducted within the site and on the local road network by the site personnel, as deemed necessary and especially during dry windy conditions to ensure that any dust sources are identified and dealt with promptly.

7.6 A complaints log will be held on site. In the event of receiving a dust complaint, the name and location of the complainant, the nature of the dust related complaint, the site activity and prevailing weather conditions at the time of the complaint shall be noted. The site foreman shall investigate the complaint and take any remedial action which is deemed appropriate.

7.7 In the event of a failure of dust mitigation measures, for example in extreme weather conditions, the dust generating activity shall be temporarily suspended, until appropriate dust mitigation is implemented or until a change in weather condition occurs.

8.0 CONCLUSIONS

8.1 It is unlikely that any significant decrease in local air quality will occur due to the proposed development at High Close Quarry. Any dust occurrence event will be limited and of short duration and will be minimised by implementation of the dust control recommendations.

8.2 With regard to PM_{10} and $PM_{2.5}$ dust levels from the site, analysis has been made of the air quality data. The conclusion of the analysis was that AQO will not be exceeded.

8.3 Overall the effect on air quality of this development with the implementation of suitable dust mitigation measures is considered to be not significant.

8.4 Appendix 4 details correspondence from Allerdale Borough Council's Environmental Health Officer which confirms his acceptance that the Vibrock air quality report adequately addresses concerns relating to the environmental impact of the scheme.

9.0 REFERENCES

1. The Environmental Effects of Dust from Surface Mineral Workings, DOE, 1995.

2. The Air Quality Strategy for England, Scotland, Wales and Northern Ireland, 2003.

3. National Planning Policy Framework, Department for Communities and Local Government, March 2012.

4. Planning Practice Guidance, Department for Communities and Local Government, March 2014.

5. Land-Use Planning and Development Control Planning for Air Quality: Planning for Air Quality. Environmental Protection UK and IAQM, May 2015.

6. Good Practice Guide: control and measurement of nuisance dust and PM_{10} from the extractive industries. Mineral Industry Research Organisation, February 2011.

7. Minerals Policy Statement 2. Controlling and mitigating the environmental effects of minerals extraction in England. Annex 1: Dust, Office of the Deputy Prime Minister, 2005.

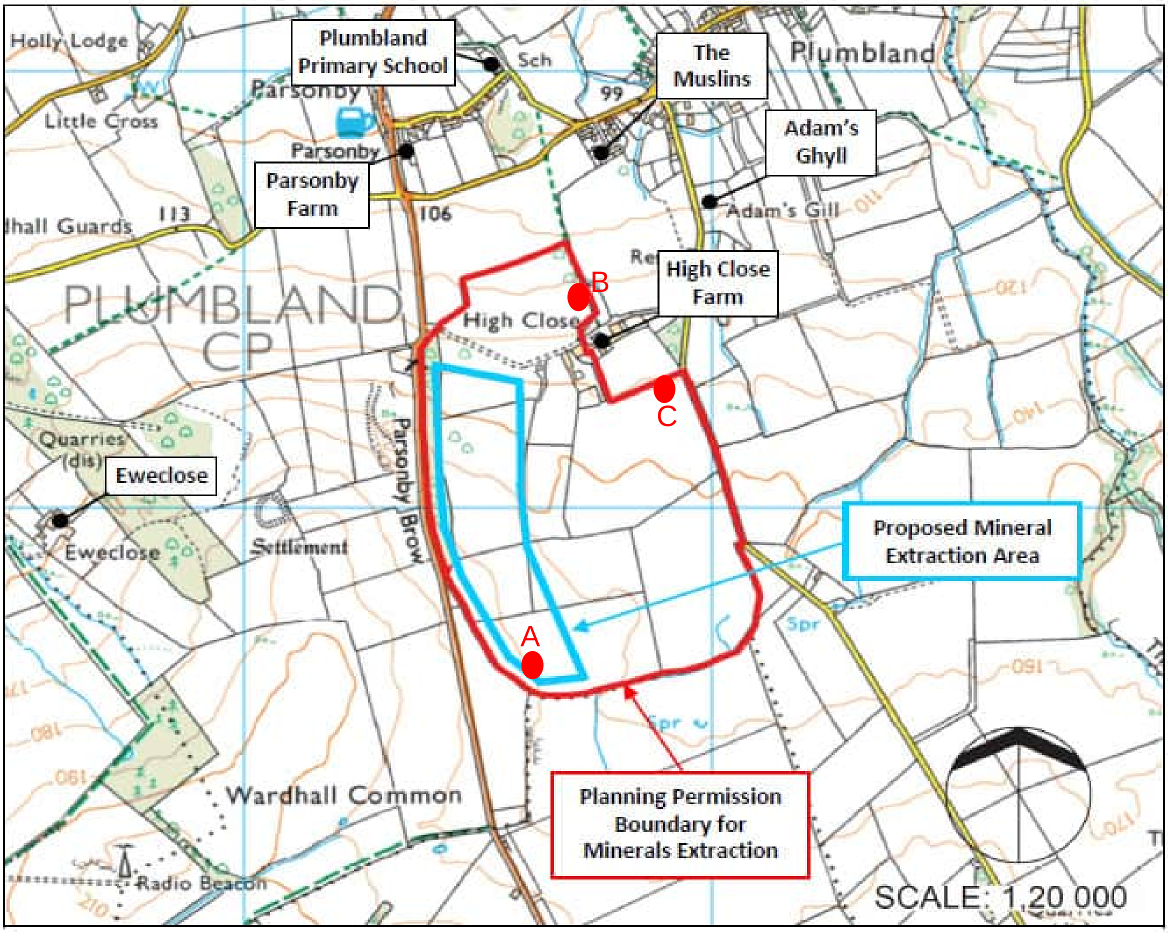
8. Her Majesty's Inspectorate of Pollution, Technical Guidance Note (Dispersion) D1, HMSO, 1993.

9. Guidance on the Assessment of Mineral Dust Impacts for Planning, IAQM, May 2016.

10. Local Air Quality Management Technical Guidance (TG16), DEFRA April 2016.

FIGURE 1

MONITORING AND PREDICTION LOCATIONS



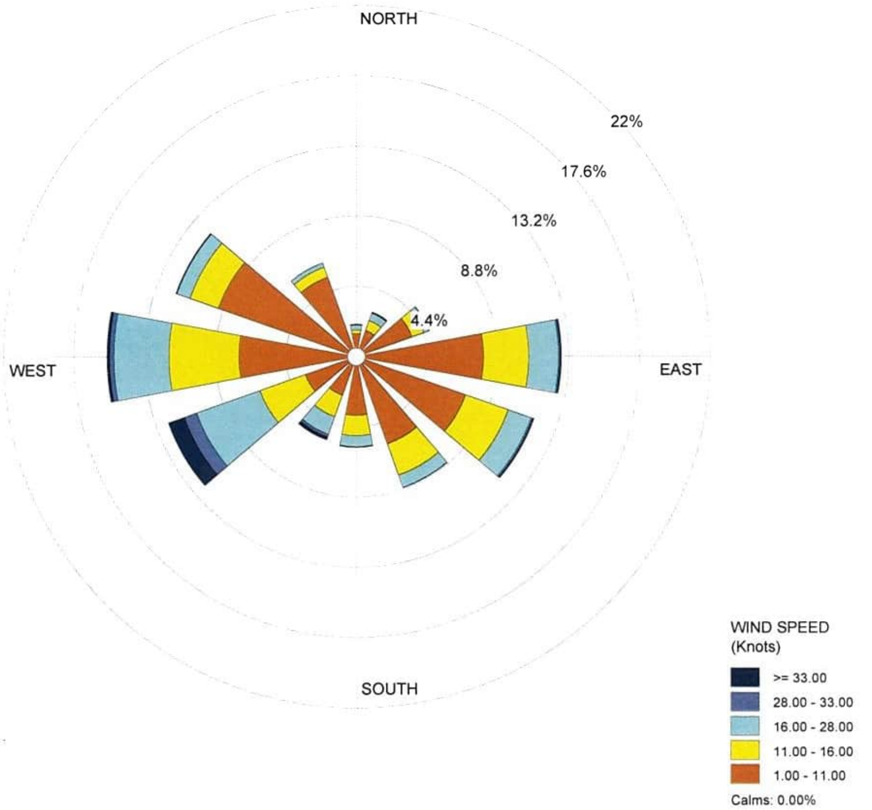
● Monitoring Locations

APPENDIX 1

WIND ROSE PLOT:

Wind Rose for Mean Wind at Keswick (Cumbria) Jan 2007 - Dec 2016

DISPLAY:
Wind Speed
Direction (blowing from)



COMMENTS:	DATA PERIOD: **Start Date: 01/01/2007 - 00:00** **End Date: 31/12/2016 - 23:00**	COMPANY NAME: **Vibrock Limited**	
		MODELER: **Matthew Weston**	
	CALM WINDS: **0.00%**	TOTAL COUNT: **87599 hrs.**	
	AVG. WIND SPEED: **10.59 Knots**	DATE: **19/04/2017**	PROJECT NO.:

WRPLOT View - Lakes Environmental Software

APPENDIX 2

MEAN NUMBER OF DAYS WITH RAINFALL LESS THAN 0.2 MM

10 YEAR PERIOD FROM 2007 TO 2016

Site: Keswick, Cumbria

Month	No of days
January	5.3
February	7.7
March	9.6
April	11.3
May	12.3
June	12.3
July	9.4
August	6.3
September	9.0
October	7.1
November	5.5
December	5.8
Annual	**101.7**

APPENDIX 3

SUMMARY OF DUST CONTROL MEASURES

Site Operation	Dust Control Measures
Site Preparation **Mineral Extraction** **Materials Handling** **On site Transportation** **Mineral Processing** **Stockpiles/Exposed Surfaces** **Off-Site Transportation**	Bunds and overburden stores to be seeded Controlled use of fixed short haul routes Drill rig to utilise integrated dust suppression Conveyor system to be utilised to minimise vehicle movements Conveyor to be well maintained and transfer points to be covered Haul routes to be regularly maintained by grading to minimise dust generation Water to be used as required via site water bowser Speed controls to be implemented on all haul routes and site access route of 10 mph Drop heights to be minimised Mobile plant exhausts and cooling fans to point away from ground All plant to be regularly maintained Mobile crushing and screening equipment to be well maintained with water used to suppress dust as required Mineral stockpiles to be dampened as required All HGVs leaving site to utilise site wheel cleansing facilities and to be sheeted

The appropriate volumes of water for dust suppression purposes will be sourced from a borehole, settlement ponds and accumulated water from the quarry as the quarry development progresses.

APPENDIX 4

Our Ref: EPA1990 S79
Your Ref: High Close Quarry Planning Application
This matter is being dealt with by: Ben Crowther
Direct Line: 07817 108921
Email: environmental.health@allerdale.gov.uk

Allerdale
borough council
www.allerdale.gov.uk

14th July 2020

Mr Peter Stephenson
Stephenson Halliday
32 Lowther Street
Kendal
LA9 4DH

Dear Mr Stephenson

High Close Quarry, Environmental Protection Act 1990, S79 Part 2A

Allerdale BC and associated consultants have reviewed the information supplied to date. This information comprises the following documents:

High Close Quarry Development; Landfill Quarry Hydrogeological Relationship; for Stephenson Halliday Consultants, Report Ref 2934-R01 by Terraconsult, April 2020.

Vibrock; Assessment of Environmental Impact of Blasting at High Close Quarry, Parsonby, Cumbria, THOMAS ARMSTRONG LIMITED R20.9449/6/DW Date of Report: 07 May 2020.

Vibrock; Air Quality Assessment of Proposed Mineral Extraction Operations at High Close Quarry, Parsonby, Cumbria; for Thomas Armstrong Limited; Ref R20.9448/5/DW Dated 28th May 2020.

Vibrock; Noise Assessment; Proposed Mineral Extraction Operations at High Close Quarry, Parsonby, Cumbria, For Thomas Armstrong Limited, Ref: R20.9447/6/AP Date of Report: 02 June 2020.

> Allerdale BC believe these documents satisfy the requirements of the comments in Richard Cain's Email of 1st November 2019: In that the site could cause a serious environmental incident. Allerdale BC believes the above reports adequately address the concerns voiced regarding mobilisation of material from the former dilute and disperse landfill cell.

In conclusion the Issues raised in the above email are valid, and conditions should be added to any planning application with modifications as detailed in the November email.

Appendix 4, 5 and 6 have been justified. Please add relevant conditions

Appendix 10 has been satisfied; please add relevant conditions.

Conditions: Appendix 11:

Namely contaminated land the Terraconsult report adequately satisfies the requirement for the part 1 of the contaminated land contamination condition. Further reports are required and so these need to be generated and approved. Parts 2, 3 and 4 should remain as conditions.

Please do not hesitate to contact me if you require further information or wish to discuss this matter further.

Yours sincerely

[redacted]

Ben Crowther
Environmental Health Officer
Governance and Regulatory Services

POSITIVE ABOUT DISABLED PEOPLE

INVESTOR IN PEOPLE

Allerdale - a great
place to live,
work and visit

Allerdale Borough Council
Allerdale House
Workington
Cumbria CA14 3YJ
Tel: 0303 123 1702

APPENDIX 6: BLASTING

Assessment of Environmental Impact of Blasting at High Close Quarry, Parsonby, Cumbria

THOMAS ARMSTRONG LIMITED

R22.9449/8/DW

Date of Report: 30 November 2022

REPORT DETAILS

Client	Thomas Armstrong Limited
Report Title	Assessment of Environmental Impact of Blasting
Site Address	High Close Quarry, Parsonby, Cumbria
Report No.	R22.9449/8/DW
Vibrock Contact	vibrock@vibrock.com

QUALITY ASSURANCE

Issue No.	Issue Date	Comments	Author	Technical Review
8	30/11/22	n/a	[redacted] D Williams MIExpE Director	[redacted] R Kennedy MIOA Director

This report has been prepared by Vibrock the trading name of Vibrock Limited, with all reasonable skill, care and diligence within the terms of the Contract with the client, incorporating our General Terms and Conditions of Business and taking account of the resources devoted to it by agreement with the client.

We disclaim any responsibility to the client and others in respect of any matters outside the scope of the above.

This report is confidential to the client and we accept no responsibility of whatsoever nature to third parties to whom this report, or any part thereof, is made known. Any such party relies on the report at their own risk.

Vibrock Limited
Shanakiel
Ilkeston Road, Heanor
Derbyshire, DE75 7DR
Tel: +44 (0) 1773 711211
Fax: +44 (0) 1773 711311
Email: vibrock@vibrock.com
Web: www.vibrock.com

COMPETENCY AND EXPERTISE

The Company

Vibrock Ltd is an established independent environmental consultancy who has been providing noise, dust and vibration consultancy services to industry since 1991. Vibrock Ltd is a member of the Association of Noise Consultants.

The Authors

Daniel Williams BSc, MIExpE has undertaken responsible work in blast vibration assessment and since 2000. He specialises in the measurement and assessment of blast vibration and groundborne vibration from civil engineering projects, demolition projects and blast vibration from mineral extraction operations. Daniel is a full Member of the Institute of Explosive Engineers and has been involved in the assessment of vibration for planning applications and EIA development relating to mineral extraction sites throughout the UK and the assessment of explosive demolition events globally.

Richard Kennedy B.Eng MIOA has been employed as a Consultant at Vibrock Limited since 2006, a Director of the Company since 2020, and has undertaken responsible work in occupational and environmental noise, dust and vibration assessments for major civil engineering projects, large manufacturing and processing industries and mineral extraction developments. In addition to a diploma in Acoustics and Noise Control, Richard is a full Member of the Institute of Acoustics.

CONTENTS

TABLES

FIGURE

APPENDICES

1.0 INTRODUCTION

1.1 At the request of Thomas Armstrong Limited, Vibrock Limited were commissioned to undertake a blast induced vibration study from mineral extraction operations at High Close Quarry, Cumbria.

1.2 It is understood that this report will accompany the application for the determination of conditions to be submitted to Cumbria County Council.

1.3 This study benefits from a site inspection undertaken on 30 May 2017.

1.4 The assessment of the implications of blasting operations within High Close Quarry contains:

- The potential effect of blast induced vibration upon the occupants of residential property
- the production of allowable instantaneous explosive charge weights for given separation distances in order to comply with the recommended criterion
- recommendations for any mitigation measures that should be adopted.

1.5 Vibration predictions within this report have been based upon an assumed blast design for the quarry and data from the monitoring of typical production blasts at quarries working similar rock to that at High Close Quarry.

Context

1.6 A vibration assessment was completed for the proposal at High Close in April 2018; for commercial reasons Thomas Armstrong Limited delayed the submission of the application and the Environmental Statement to August 2019.

1.7 The 2018 assessment has been updated from February 2020 following receipt of consultation responses on the application from Allerdale Borough Council Environmental Health Department dated 1 November 2019, Plumbland Parish Council Technical Memorandum dated 7 November 2019 and a Public Meeting held on 19 October 2019.

1.8 There was concern at the public meeting that the assessment had not specifically predicted ground vibration levels at Plumbland School. This is now detailed in Paragraph 9.12.

1.9 The EHO response asked that further information be provided to describe the likely frequency of blasting with additional references to BS 7385-2 which is the appropriate British Standard for assessing the human exposure to vibration in buildings from blast induced vibration.

1.10 There was also concern raised on the effects of blasting in relation to the former landfill site. Vibrock are aware that this matter has been addressed by Kevan Walton, the geotechnical consultant, but Vibrock has significant experience of blasting operations in relatively close proximity to landfill sites which is referred to in Paragraphs 9.15 to 9.16.

1.11 United Utilities have responded to the planning application with concerns in respect of blasting on two of their assets in the vicinity of the proposed quarry. Firstly a 3 inch watermain to the east of the proposed quarry and service reservoir to the north of the proposed quarry. An assessment has been made in respect of these two assets.

1.12 At the time the initial assessment was completed, Thomas Armstrong Limited owned High Close Farm located to the north-east of the application site.

1.13 Since then the Company has sold High Close Farm, together with some land to the north of the proposed development to a local person. The new owner intends to run an existing agricultural shed building company from the property and there will be storage of diggers with a small amount of fabrication, so the area immediately surrounding the farm house will have an industrial use.

1.14 The new owner was fully aware of the proposal to quarry and implement the dormant planning permission, but was keen to buy the property. The proposal has been in the public arena following the formal request to Cumbria County Council for a Scoping Opinion in April 2017.

1.15 As part of the sale and purchase agreement the new owner, being completely aware of the proposal, has formally and legally agreed that he will not object to the proposed application or to the ongoing operations. Also this covenant will apply to future owners.

1.16 The Land Registry Transfer Document TP1, Section 12.19 headed, Restrictive covenants by the transferee, states the following:

The Transferee covenants with the Transferor to observe and perform the restrictions specified below and it is agreed and declared that:

i) the benefit of the covenant and the restrictions are to be attached to and ensure for the benefit of each and every part of the Transferor's Retained Land and Minerals;

ii) the burden of this covenant and the restrictions is intended to bind and binds each and every part of the Property into whosoever hands it may come.

12.19.1 The particular restrictions are in clause "c" and "e" set out below:

(c) not to object to any planning applications and not make any objections, claims or comments of any description on any application for planning permission including applications made in relation to any variations, approvals or submissions or any other applications)made by the Transferor, their agents or subcontractors or made on their behalf in respect of any part of the Transferor's Retained Land /or Minerals on or under the Transferor's Retained Land in relation to any use of the Transferor's Retained Land and /or Minerals on or under the Transferor's Retained Land for quarrying and/or associated activities (including but not limited to restoration infill or waste disposal) (for the avoidance of doubt this shall include but not be limited to any applications made with respect to Planning Permission No. CA49 and any subsequent correspondence arising from it or any appeal or public enquiry arising from any such application).

(e) not to object to , or bring any claims processing demands or actions in nuisance or similar claim against the Transferor or any agents, subcontractors, tenant or licensee of the same in relation to, the development or use of the Transferor's Retained Land and or/ the Minerals on or under the Transferor's Retained Land for the purposes of quarrying or associated activities(including but not limited to restoration, infill or waste disposal) but nothing in this clause shall limit the liability of the Transferor for loss of damage recklessly, wilfully or internationally caused to the Property or the Transferee.

1.17 A revised assessment was carried out, taking into account that High Close Farm is now not in the ownership of the applicant. However the new owner is fully aware and accepting of the proposal as mentioned above.

1.18 In September 2020, a series of revised phasing plans were produced for the quarry development. This assessment takes into account the September 2020 revisions

1.19 Finally The Assessment has been revised accordingly in line with the Regulation 22 Schedule (Reg 22) of Further Information Required, request from Cumbria County Council, dated June 2020 in respect of blasting.

1.20 The Reg 22 document asked the following;

- Further information/clarification required, to include identification of frequency of blasting (see paragraphs 7.3 and 9.27); further assessment of nuisance/amenity impacts on residents/local receptors (to include those at the identified receptor points and High Close Farm); proposed blasting levels, potential impacts and associated perceptions. (all these have been done and addresses in Chapter 9)

- The further information submitted must address requirements specified in Scoping Opinion (June 2019 - Blasting and Ground Vibration and Health sections) [all this has been done].

- Further information required to assess the potential impacts of blasting upon the public highway (B5301) (see paragraphs 9.24 -9.25) and users of the highway (also any associated traffic impacts - to be included in updated Transport Assessment); and to assess the potential impacts of blasting upon the existing landfill site (see paragraphs 9.15 to 9.16, the gas pipeline crossing the site (see paragraphs 9.13, 9.14 and Appendix A) and utilities infrastructure (see paragraphs 9.17 to 9.23)

2.0 SITE DESCRIPTION

2.1 The proposed mineral extraction area lies to the western side of the site planning permission boundary, as detailed within Environmental Statement Figures 9 to 13.

2.2 The extraction of aggregate will be achieved by blasting the rock through the use of controlled explosive charges with anticipated maximum instantaneous charge (MIC) in the order of 96 kg.

2.3 The closest residential properties to the north of the site are within the village of Parsonby at distances of approximately 490 metres at closest approach. High Close Farm is approximately 200 metres from the closest of blasting operations.

2.4 The optimum blast design may vary from blast to blast and will necessarily be decided by the quarry operator with reference to the site specific conditions and in order to comply with the recommended vibration criteria.

3.0 EFFECTS OF BLASTING

3.1 When an explosive detonates within a borehole stress waves are generated causing very localised distortion and cracking. Outside of this immediate vicinity, however, permanent deformation does not occur. Instead, the rapidly decaying stress waves cause the ground to exhibit elastic properties whereby the rock particles are returned to their original position following the passage of the stress waves. Such vibration is always generated even by the most well designed and executed of blasts and will radiate away from the blast site attenuating as distance increases.

3.2 With experience and knowledge of the factors which influence ground vibration, such as blast type and design, site geology and receiving structure, the magnitude and significance of these waves can be accurately predicted at any location.

3.3 Vibration is also generated within the atmosphere where the term air overpressure is used to encompass both its audible and sub-audible frequency components. Again, experience and knowledge of blast type and design enables prediction of levels and an assessment of their significance. In this instance, predictions can be made less certain by the fact that air overpressure levels may be significantly influenced by atmospheric conditions. Hence the most effective method of control is its minimisation at source.

3.4 It is important to realise that for any given blast it is very much in the operator's interest to always reduce vibration, both ground and airborne to the minimum possible in that this substantially increases the efficiency and hence economy of blasting operations.

4.0 BLAST VIBRATION TERMINOLOGY

4.1 Ground Vibration

4.1.1 Vibration can be generated within the ground by a dynamic source of sufficient energy. It will be composed of various wave types of differing characteristics and significance collectively known as seismic waves.

4.1.2 These seismic waves will spread radially from the vibration source decaying rapidly as distance increases.

4.1.3 There are four interrelated parameters that may be used in order to define ground vibration magnitude at any location. These are:-

Displacement	-	the distance that a particle moves before returning to its original position, measured in millimetres (mm).
Velocity	-	the rate at which particle displacement changes, measured in millimetres per second (mms^{-1}).
Acceleration	-	the rate at which the particle velocity changes, measured in millimetres per second squared (mms^{-2}) or in terms of the acceleration due to the earth's gravity (g).
Frequency	-	the number of oscillations per second that a particle undergoes measured in Hertz (Hz).

4.1.4 Much investigation has been undertaken, both practical and theoretical, into the damage potential of blast induced ground vibration. Among the most eminent of such research authorities are the former United States Bureau of Mines (USBM), Langefors and Kihlström, and Edwards and Northwood. All have concluded that the vibration parameter best suited as a damage index is particle velocity.

4.1.5 Studies by the USBM have clearly shown the importance of adopting a monitoring approach that also includes frequency.

4.1.6 Thus the parameters most commonly used in assessing the significance of an impulsive vibration are those of particle velocity and frequency which are related for sinusoidal motion as follows:-

$$PV = 2 \pi f a$$

	PV	=	$2 \pi f a$
where	PV	=	particle velocity
	π	=	pi
	f	=	frequency
	a	=	amplitude

4.1.7 It is the maximum value of particle velocity in a vibration event, termed the peak particle velocity, that is of most significance and this will usually be measured in three independent, mutually perpendicular directions at any one location in order to ensure that the true peak value is captured. These directions are longitudinal (or radial), vertical and transverse.

4.1.8 Such maximum of any one plane of measurement is the accepted standard worldwide and as recommended by the British Standards Institution and the International Standards Institute amongst others. It is also the basis for all the recognised investigations into satisfactory vibration levels with respect to damage of structures and human perception.

4.1.9 British Standard 7385 states that there is little probability of fatigue damage occurring in residential building structures due to blasting. The increase of the component stress levels due to imposed vibration is relatively nominal and the number of cycles applied at a repeated high level of vibration is relatively low. Non-structural components (such as plaster) should incur dynamic stresses which are typically well below, i.e. only 5% of, component yield and ultimate strengths.

4.1.10 All research and previous work undertaken has indicated that any vibration induced damage will occur immediately if the damage threshold has been exceeded and that there is no evidence of long term effects.

4.2 Airborne Vibration

4.2.1 Whenever an explosive is detonated transient airborne pressure waves are generated.

4.2.2 As these waves pass a given position, the pressure of the air rises very rapidly to a value above the atmospheric or ambient pressure. It then falls more slowly to a value below atmospheric before returning to the ambient value after a series of oscillations. The maximum pressure above atmospheric is known as the peak air overpressure.

4.2.3 These pressure waves will comprise of energy over a wide frequency range. Energy above 20 Hz is perceptible to the human ear as sound, whilst that below 20 Hz is inaudible, however, it can be sensed in the form of concussion. The sound and concussion together is known as air overpressure which is measured in terms of decibels (dB) or pounds per square inch (p.s.i.) over the required frequency range.

4.2.4 The decibel scale expresses the logarithm of the ratio of a level (greater or less) relative to a given base value. In acoustics, this reference value is taken as 20 x 10^{-6} Pascals, which is accepted as the threshold of human hearing.

4.2.5 Air overpressure (AOP) is therefore defined as:-

$$\text{AOP, dB} = 20 \text{ Log} \quad \frac{\text{(Measured pressure)}}{\text{(Reference pressure)}}$$

4.2.6 Since both high and low frequencies are of importance no frequency weighting network is applied, unlike in the case of noise measurement when an A - weighted filter is employed.

4.2.7 All frequency components, both audible and inaudible, can cause a structure to vibrate in a way which can be confused with the effects of ground vibrations.

4.2.8 The lower, inaudible, frequencies are much less attenuated by distance, buildings and natural barriers. Consequently, air overpressure effects at these frequencies can be significant over greater distances, and more readily excite a response within structures.

4.2.9 Should there be perceptible effects they are commonly due to the air overpressure inducing vibrations of a higher, audible frequency within a property and it is these secondary rattles of windows or crockery that can give rise to comment.

4.2.10 In a blast, airborne pressure waves are produced from five main sources:-

(i) Rock displacement from the face
(ii) Ground induced airborne vibration
(iii) Release of gases through natural fissures
(iv) Release of gases through stemming
(v) Insufficiently confined explosive charges

4.2.11 Meteorological factors over which an operator has no control can influence the intensity of air overpressure levels at any given location. Thus, wind speed and direction, temperature and humidity at various altitudes can have an effect upon air overpressure.

5.0 VIBRATION CRITERIA

5.1 Introduction

5.1.1 When defining damage to residential type structures the following classifications are used:-

Cosmetic or threshold	-	the formation of hairline cracks or the growth of existing cracks in plaster, drywall surfaces or mortar joints.
Minor	-	the formation of large cracks or loosening and falling of plaster on drywall surfaces, or cracks through bricks/concrete blocks.
Major or structural	-	damage to structural elements of a building.

5.1.2 Published damage criteria will not necessarily differentiate between these damage types but rather give levels to preclude cosmetic damage and therefore automatically prevent any more severe damage.

5.2 United States Bureau of Mines

5.2.1 The comprehensive research programme undertaken by the United States Bureau of Mines (USBM) (R.I. 8507, 1980) determined that vibration values well in excess of 50 mms^{-1} are necessary to produce structural damage to residential type structures. The onset of cosmetic damage can be associated with lower vibration levels, especially at very low vibration frequencies, and a limit of 12.7 mms^{-1} is therefore recommended for such relatively unusual vibration. For the type of vibration associated with open pit blasting in this country, the safe vibration levels are seen to be from 19 - 50 mms^{-1}.

5.2.2 A further USBM publication (Bureau of Mines Technology Transfer Seminar, 1987) states that these safe vibration levels are "….for the worst case of structure conditions….", and that they are "….independent of the number of blasting events and their durations", and that no damage has occurred in any of the published data at vibration levels less than 12.7 mms^{-1}.

5.2.3 Any doubt that such low levels of vibration are perfectly safe should be dispelled by considering the strain induced within a residential type property from daily environmental changes and domestic activities. This is confirmed within the 1987 USBM publication which quotes that daily changes in humidity and temperature can readily induce strain of the order that is equivalent to blast induced vibration of from 30 - 75 mms^{-1}. Typical domestic activities will produce strain levels corresponding to vibration of up to 20 mms^{-1} and greater.

5.2.4 It is for this reason that many domestic properties will exhibit cracks that may be wrongly attributed to blasting activities. There are many additional reasons why properties will develop cracks, for example:-

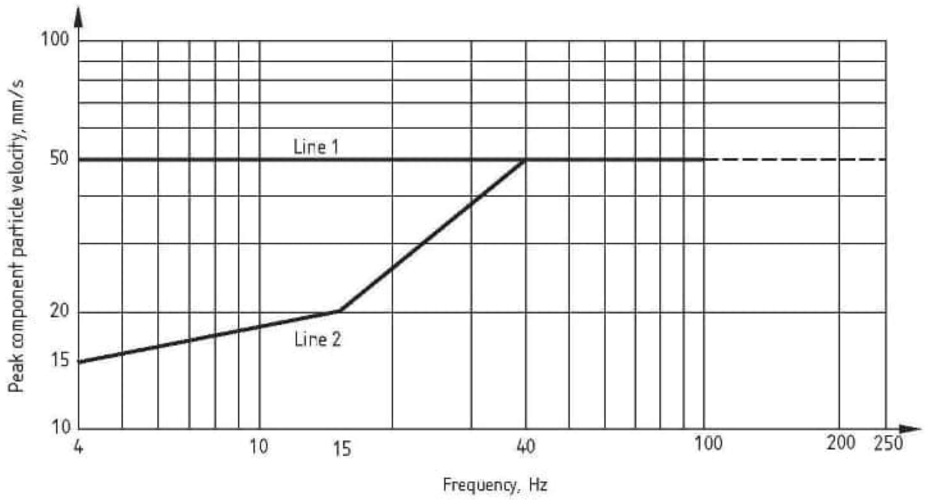
a) Fatigue and ageing of wall coverings;
b) Drying out of plaster finishes;
c) Shrinkage and swelling of wood;
d) Chemical changes in mortar, bricks, plaster and stucco;
e) Structural overloading;
f) Differential foundation settlement - particularly after times of prolonged dry spells.

5.3 British Standard 7385-2: 1993 - Evaluation and Measurement for Vibration in Buildings: Guide to Damage Levels from Groundborne Vibration

5.3.1 The British Standards Institution's structural damage committee have investigated impulsive vibration with respect to its damage potential. They contacted some 224 organisations, mainly British, and found no evidence of any damage at levels less than those recommended by the USBM. The investigation culminated in British Standard 7385: Part 2: 1993.

5.3.2 British Standard 7385 gives guide values to prevent cosmetic damage to property. Between 4 Hz and 15 Hz, a guide value of 15 - 20 mms^{-1} is recommended, whilst above 40 Hz the guide value is 50 mms^{-1}. These vibration criteria reconfirm those of the USBM:

Line	Type of Building	Peak component particle velocity in frequency range of predominant pulse	
		4 Hz to 15 Hz	15 Hz and above
1	Reinforced or framed structures	50 mms^{-1} at 4 Hz and above	50 mms^{-1} at 4 Hz and above
	Industrial and heavy commercial buildings		
2	Unreinforced or light framed structures	15 mms^{-1} at 4 Hz increasing to 20 mms^{-1} at 15 Hz	20 mms^{-1} at 15 Hz increasing to 50 mms^{-1} at 40 Hz and above
	Residential or light commercial buildings		
Note 1 – values referred to are at the base of the building Note 2 – for line 2, at frequencies below 4 Hz, a maximum displacement of 0.6 mm (zero to peak) is not to be exceeded			



Transient vibration guide values for cosmetic damage (BS 7385-2: 1993, pg 6)

5.3.3 All research and previous work undertaken has indicated that any vibration induced damage will occur immediately if the damage threshold has been exceeded and that there is no evidence of long term effects.

5.3.4 Whilst cosmetic damage levels range from 15 to 50 mms^{-1}, according to BS 7385: Part 2, “Minor damage is possible at vibration magnitudes which are greater than twice those given for cosmetic damage, and major damage to a building structure may occur at values greater than four times the tabulated values”. Hence vibration levels necessary for structural damage within property are accepted to be around 200 mms^{-1} and above.

5.4 BS 5228-2: 2009 + A1: 2014, Code of practice for noise and vibration control on construction and open sites – Part 2: Vibration

5.4.1 Damage threshold criteria for transient vibration within British Standard 5228-2: 2009 + A1: 2014 is guided by the tabulated levels contained within BS 7385-2: 1993.

5.5 Planning Practice Guidance to the National Planning Policy Framework (2014)

5.5.1 In March 2014 the Planning Practice Guidance was issued by the Government as a framework for assessing the environmental impacts of mineral extraction in England.

5.5.2 The guidance document states that the environmental impact of blasting operations should be assessed but does not provide an assessment framework or guidance on relevant planning conditions. The British Standards and other documents detailed within this report however provide relevant guidance which is in line with the vibration criteria detailed within the former Mineral Planning Guidance notes MPG 9 and 14, archived in March 2014.

5.5.3 The former MPG 9 and 14 stated that planning conditions should provide for limits on the timing of blasts and on ground vibrations received at sensitive properties, for monitoring to ensure that the limits are not exceeded and for methods to be employed minimising air overpressure.

5.5.4 Acceptable ground vibration criteria within the former MPG 9 and 14 suggested a range of between 6 to 10 mms^{-1} at a 95% confidence level measured at sensitive property, with no individual blast to exceed 12 mms^{-1}.

5.6 The Environmental Effects of Production Blasting from Surface Mineral Workings, DETR (Vibrock Limited)

5.6.1 These same criteria are also recommended within the 1998 Department of the Environment Transport and The Regions research publication, The Environmental Effects of Production Blasting from Surface Mineral Workings.

5.6.2 This same DETR publication also notes that "It would appear that over the years conditions have become progressively more stringent. No doubt this is as a result of MPAs seeking to reduce the number of complaints and by operators seeking to resolve issues more quickly. However, a reduction in complaints will not necessarily follow".

5.6.3 Indeed, one of the principal findings of the study which led to this publication is "Once the threshold of perception had been crossed the magnitude of vibration seemed to bear little relation to the level of resulting complaint".

5.6.4 An explanation of the necessity to use explosives and the likely effects as perceived by a site's neighbours can allay the concern of a significant proportion of those inhabitants of neighbouring property. It is invariably the case that an operator will consider the perception threshold level prior to the design of each and every blast at a particular site.

5.7 Air Overpressure

5.7.1 Comprehensive investigations into the nature and effects of air overpressure with particular reference to its damage potential have been undertaken by the United States Bureau of Mines (R.I. 8485, 1980).

5.7.2 The weakest parts of most structures that are exposed to air overpressure are windows. Poorly mounted, and hence pre-stressed windows might crack at around 150 dB (0.1 p.s.i.) with most cracking at 170 dB (1.0 p.s.i.). Structural damage can be expected at 180 dB (3.0 p.s.i.).

5.7.3 The recommendations by the United States Bureau of Mines are as follows:-

Instrument Response	Maximum Recommended Level (dB)
0.1 Hz high pass	134
2.0 Hz high pass	133
5.0 or 6.0 Hz high pass	129
C- Slow	105 dB (C)

5.7.4 This set of criteria is based on minimal probability of the most superficial type of damage in residential-type structures, the single best descriptor being recommended as the 2 Hz high pass system (R.I. 8485, 1980).

5.7.5 Satisfactory air overpressure levels are contained within BS 6472-2: 2008, which states the previously discussed research by USBM. According to BS 6472-2: 2008, “air overpressure levels measured at properties near quarries in the United Kingdom are generally around 120 dB(lin), which is 30 dB(lin) below, or only 3% of, the limit for cracking pre-stressed poorly mounted windows”. The British Standard further suggests that due to the variable effects of the weather conditions at the time of any blast, the aim should always be to minimise air overpressure at source by giving careful consideration to blast design and implementation.

5.7.6 Guidance contained within the previously mentioned 1998 DETR publication and the former MPG 9 and 14 does not recommend an air overpressure limit, rather the operator should submit methods to minimise air overpressure to the Mineral Planning Authority.

5.7.7 With a sensible ground vibration limitation the economics of safe and efficient blasting will automatically ensure that air overpressures are kept to reasonable levels.

5.8 Perception Levels

5.8.1 The fact that the human body is very sensitive to vibration can result in subjective concern being expressed at energy levels well below the threshold of damage.

5.8.2 A person will generally become aware of blast induced vibration at levels of around 1.5 mms^{-1}, although under some circumstances this can be as low as 0.5 mms^{-1}. Even though such vibration is routinely generated within any property and is also entirely safe, when it is induced by blasting activities it is not unusual for such a level to give rise to subjective concern. Such concern is also frequently the result of the recent discovery of cracked plaster or brickwork that in fact has either been present for some time or has occurred due to natural processes.

5.8.3 It is our experience that virtually all complaints regarding blasting arise because of the concern over the possibility of damage to owner-occupied properties. Such complaints are largely independent of the vibration level. In fact, once an individual's perception threshold is attained, complaints can result from 3% to 4% of the total number of blasts, irrespective of their magnitude.

5.9 British Standard 6472–2: 2008 - Guide to evaluation of human exposure to vibration in buildings: Part 2: Blast-induced vibration

5.9.1 This document discusses how and where to measure blast-induced vibration and gives maximum satisfactory magnitudes of vibration with respect to human response. Satisfactory magnitudes are given as 6 to 10 mms^{-1} at a 90% confidence level as measured outside of a building on a well-founded hard surface as close to the building as possible.

5.9.2 Maximum satisfactory magnitudes of vibration with respect to human response for up to three blast vibration events per day are detailed within Table 1 of BS 6472-2: 2008:

Place	Time	Satisfactory magnitude A) (ppv mms^{-1})
Residential	Day D)	6.0 to 10.0 C)
	Night D)	2.0
	Other times D)	4.5
Offices B)	Any time	14.0
Workshops B)	Any time	14.0

A) The satisfactory magnitudes are the same for the working day and the rest day unless otherwise stated;
B) Critical working areas where delicate tasks impose more stringent criteria than human comfort are outside the scope of this standard;
C) With residential properties people exhibit a wide variation of tolerance to vibration. Specific values are dependent upon social and cultural factors, psychological attitudes and the expected degree of intrusion. In practice the lower satisfactory magnitude should be used with the higher magnitude being justified on a case-by-case basis;
D) For the purpose of blasting, daytime is considered to be 08h00 to 18h00 Monday to Friday and 08h00 to 13h00 Saturday. Routine blasting would not normally be considered on Sundays or Public Holidays. Other times cover the period outside of the working day but exclude night-time, which is defined as 23h00 to 07h00.

6.0 PREDICTION AND CONTROL OF VIBRATION LEVELS

6.1 Ground Vibration

6.1.1 The accepted method of predicting peak particle velocity for any given situation is to use a scaling approach utilising separation distances and instantaneous charge weights. This method allows the derivation of the site specific relationship between ground vibration level and separation distance from a blast.

6.1.2 A scaled distance value for any location may be calculated as follows:-

Scaled Distance, SD = $DW^{-½}$ in $mkg^{-½}$

where	D	=	Separation distance (blast to receiver) in metres
	W	=	Maximum Instantaneous Charge (MIC) in kg i.e. maximum weight of explosive per delay interval in kg

6.1.3 For each measurement location the maximum peak particle velocity from either the longitudinal, vertical or transverse axis is plotted against its respective scaled distance value on logarithmic graph paper.

6.1.4 An empirical relationship derived by the USBM relates ground vibration level to scaled distance as follows:-

$$PV = a\,(SD)^{b}$$

where	PV	=	Maximum Peak Particle Velocity in mms^{-1}
	SD	=	Scaled Distance in $mkg^{-½}$
	a,b	=	Dimensionless Site Factors

6.1.5 The site factors a and b allow for the influence of local geology upon vibration attenuation as well as geometrical spreading. The values of a and b are derived for a specific site from least squares regression analysis of the logarithmic plot of peak particle velocity against scaled distance which results in the mathematical best fit straight line where

a is the peak particle velocity intercept at unity scaled distance
and b is the slope of the regression line

6.1.6 In almost all cases, a certain amount of data scatter will be evident, and as such statistical confidence levels are also calculated and plotted.

6.1.7 The statistical method adopted in assessing the vibration data is that used by Lucole and Dowding. The data is presented in the form of a graph showing the attenuation of ground vibration with scaled distance and results from log - normal modelling of the velocity distribution at any given scaled distance. The best fit or mean (50%) line as well as the upper 95% confidence level are plotted.

6.1.8 The process for calculating the best fit line is the least squares analysis method. The upper 95% confidence level is found by multiplying the mean line value by 1.645 times 10 raised to the power of the standard deviation of the data above the mean line. A log - normal distribution of vibration data will mean that the peak particle velocity at any scaled distance tends to group at lower values.

6.1.9 From the logarithmic plot of peak particle velocity against scaled distance, for any required vibration level it is possible to relate the maximum instantaneous charge and separation distance as follows:-

Maximum Instantaneous Charge (MIC) = $(D/SD)^2$

Where D	=	Separation distance (blast to receiver) in metres
SD	=	Scaled Distance in $mkg^{-½}$ corresponding to the vibration level required

6.1.10 The scaled distance approach assumes that blast design remains similar between those shots used to determine the scaling relationship between vibration level and separation distance and those for which prediction is required. For prediction purposes, the scaling relationship will be most accurate when calculations are derived from similar charge weight and distance values.

6.1.11 The main factors in blast design that can affect the scaling relationship are the maximum instantaneous charge weight, blast ratio, free face reflection, delay interval, initiation direction and blast geometry associated with burden, spacing, stemming and subdrill.

6.1.12 Although the instantaneous explosive charge weight has perhaps the greatest effect upon vibration level, it cannot be considered alone, and is connected to most aspects of blast design through the parameter blast ratio.

6.1.13 The blast ratio is a measure of the amount of work expected per unit of explosive, measured for example in tonnes of rock per kilogramme of explosive detonated (tonnes/kg), and results from virtually all aspects of a blast design i.e. hole diameter, depth, burden, spacing, loading density and initiation technique.

6.1.14 The scaled distance approach is also strictly valid only for the specific geology in the direction monitored. This is evident when considering the main mechanisms which contribute to ground motion dissipation:-

(i) Damping of ground vibrations, causing lower ground vibration frequencies with increasing distance.
(ii) Discontinuities causing reflection, refraction and diffraction.
(iii) Internal friction causing frequency dependent attenuation, which is greater for coarser grained rocks.
(iv) Geometrical spreading.

6.1.15 In practice similar rates of vibration attenuation may occur in different directions, however, where necessary these factors should be routinely checked by monitoring, especially on sites where geology is known to alter.

6.1.16 Where it is predicted that the received levels of vibration will exceed the relevant criteria, the operator will have to reduce the maximum instantaneous explosive charge weight. One method of achieving such a reduction is to deck the explosives within the borehole. This technique splits the column of explosives in two, separated by inert material. If blasting is required at closer distances than that where double decking would be a successful strategy, other charge reduction methods would have to be employed. These could be more complex decking strategies or changes to the blast geometry and / or the use of smaller diameter boreholes.

6.2 Airborne Vibration

6.2.1 Airborne vibration waves can be considered as sound waves of a higher intensity and will, therefore, be transmitted through the atmosphere in a similar manner. Thus meteorological conditions such as wind speed, wind direction, temperature, humidity and cloud cover and how these vary with altitude, can affect the level of the air overpressure value experienced at a distance from any blast.

6.2.2 If a blast is fired in a motionless atmosphere in which the temperature remains constant with altitude then the air overpressure intensity will decrease purely as a function of distance. In fact, each time the distance doubles the air overpressure level will decrease by 6dB. However, such conditions are very rare and it is more likely that a combination of the factors mentioned above will increase the expected intensity in some areas and decrease it in others.

6.2.3 Given sufficient meteorological data it is possible to predict these increases or decreases. However, to be of use this data must be both site specific and of relevance to the proposed blasting time. In practice this is not possible because the data is obtained from meteorological stations at some distance from the blast site and necessarily at some time before the blast is to be detonated. The ever changing British weather therefore causes such data to be rather limited in value and its use clearly counter productive if it is not relevant to the blast site at the detonation time. In addition, it would not normally be safe practice to leave charged holes standing for an unknown period of time.

6.2.4 It is because of the variability of British weather that it is standard good practice to control air overpressure at source and hence minimise its magnitude at distance, even under relatively unfavourable conditions.

6.2.5 Such control is achieved in a well designed and executed blast in which all explosive material is adequately confined. Thus particular attention must be given to accurate face profiling and the subsequent drilling and correct placement of explosive within any borehole, having due regard to any localised weaknesses in the strata including overbreak from a previous shot, clay joints and fissured ground.

6.2.6 Stemming material should be of sufficient quantity and quality to adequately confine the explosives, and care should be taken in deciding upon the optimum detonation technique for the specific site circumstances.

6.2.7 Although there will always be a significant variation in observed air overpressure levels at a particular site it is possible to predict a range of likely values given sufficient background information and/or experience. In this respect, past recordings may be analysed according to the cube root scaled distance approach to provide a useful indication of future levels.

7.0 OPERATIONAL DETAILS

7.1 A face height of 12 metres has been used for the purpose of this assessment. A loading density of 12kg per metre and 4 metres of stemming have been assumed, giving rise to a maximum instantaneous explosive charge weight of 96 kg.

7.2 The optimum blast design may vary from blast to blast and will necessarily be decided by the quarry operator with reference to the site specific conditions and in order to comply with the recommended vibration criteria.

7.3 It is anticipated that blasting would take place on average once a week.

8.0 VIBRATION DATA

8.1 Blast vibration data monitored at quarries working similar strata as that at High Close Quarry has been accessed from the Vibrock database.

8.2 The data has been used together with the USBM formula to predict vibration levels calls for the maximum peak particle velocity (PPV) to be plotted against scaled distance (SD) in a logarithmic manner. The latter is defined as:-

$$\text{Scaled Distance } (\text{mkg}^{-½}) = \frac{\text{blast/receiver separation distance (m)}}{(\text{MIC})^{0.5}}$$

where MIC is the maximum instantaneous charge weight in kg.

9.0 DISCUSSION

9.1 Table 1.1 gives the allowable maximum instantaneous explosive charge weights in order to comply with the recommended site vibration criterion for inhabited residential properties of 6 mms^{-1} at the given separation distances. A maximum instantaneous charge weight of 96 kg could be used approximately 225 metres from property whilst complying with the site vibration criterion.

9.2 Table 2 details the predicted vibration levels when blasting within the quarry and employing an instantaneous explosive charge weight of 96 kg, again at the nearest possible distance of approach to the locations given.

9.3 The predicted maximum vibration levels given will only occur when using an instantaneous charge weight of 96 kg at the nearest possible distance of approach to the respective locations.

9.4 As such, the vast majority of blasting events within the extraction area will be significantly below the levels given.

Parsonby Farm

9.5 Parsonby Farm is located to the north of the mineral extraction area. The maximum likely vibration levels during the closest of blasting operations are predicted to generate a most likely (50% confidence level) 1.1 mms^{-1} and a maximum likely (95% confidence level) 2.2 mms^{-1}. Vibration of such magnitude is well within the recommended vibration criterion of 6 mms^{-1} at a 95% confidence level.

The Muslins

9.6 The residential receptors on The Muslins are located to the north east of the quarry. The maximum likely vibration level (95% confidence level) at the closest residential receptor is predicted to be 1.8 mms^{-1}. The worst case predicted vibration level is well within the recommended site vibration criterion of 6 mms^{-1} at 95% confidence level.

Adam's Ghyll

9.7 The residential receptor of Adam's Ghyll is located to the north east of the quarry void as displayed on Figure 1.

9.8 The closest approach of blasting operations is predicted to generate a most likely vibration level of 0.9 mms^{-1} and 1.8 mms^{-1} at a 95% confidence level. Vibration of such magnitude is well within the proposed site vibration criterion of 6 mms^{-1} at 95% confidence level.

Eweclose

9.9 The receptor of Eweclose is located to the west of the quarry development. Blasting operations at the closest approach to this receptor are predicted to generate vibration levels of a 0.6 mms^{-1} at a 50% confidence level and 1.2 mms^{-1} at a 95% confidence level.

High Close Farm

9.10 The receptor of High Close Farm has recently been purchased and the new owner is fully aware of the proposals.

9.11 Blasting operations at closest approach to the property when utilising a maximum instantaneous explosive charge weight of 96 kg would generate a most likely 3.5 mms^{-1} maximum likely vibration level of 6.9 mms^{-1}. Thus when blasting at the closest approach to property, a slight reduction of the maximum instantaneous charge weight to 76 kg would be required, in line with Table 1.1, to attain the recommended vibration criterion at this receptor.

Plumbland C of E School

9.12 The Plumbland C of E School is located to the north of the mineral extraction area. At the closest approach of blasting operations to the School, when utilising a maximum instantaneous explosive charge weight of 96 kg, would generate a most likely 0.7 mms^{-1}, maximum likely vibration level of 1.4 mms^{-1}. The majority of blasts within the mineral extraction area would therefore be significantly below the levels given.

Northern Gas Networks Pipeline

9.13 The Derwent Park to Bothel 350 mm Gas Pipeline crosses the quarry mineral extraction area. It is understood that at an appropriate stage in the development of the quarry, Northern Gas Networks will be obliged to move the pipeline so that it does not sterilise development in order that there will be no potential adverse effect on the pipeline from blasting.

9.14 Appendix A details the e-mail correspondence with Northern Gas Networks (NGN) relating to blast vibration and the gas pipeline. The outcome of the correspondence is that NGN are satisfied with the proposal of a 54m stand-off to the gas pipeline, subject to monitoring.

Adjacent Landfill Site

9.15 Vibrock Limited has significant experience of blasting operations in relatively close proximity to landfill sites. It is not unusual, for example, for quarries to be used as landfill sites whilst blasting operations are on-going or for blasting operations to be required adjacent to former landfill sites.

9.16 Such experience includes Llanddulas Quarry in Conwy, Judkins Quarry in Warwickshire, Groby Quarry in Leicestershire, Dunbar Quarry in East Lothian and the Drumshangie Site in North Lanarkshire. At none of these sites have we been aware of any problems whatsoever in respect of adjacent blasting operations. In respect of fissures opening within the landfill site, typically rock fracturing will only occur within the immediate vicinity of the shot holes. Outside of this immediate vicinity permanent deformation does not occur.

United Utilities Assets in the Vicinity

9.17 United Utilities (UU) have two assets in the vicinity of the proposed development, a 3 inch watermain to the east of the proposed quarry and an underground service reservoir site to the north of the proposed quarry.

9.18 UU responded to Cumbria County Council on the 31 October 2019, reference DC/19/4556, on the security of their watermain asset, particularly regarding blasting from the proposed quarry. Vibrock have assessed the watermain in relation to blasting. The United Utilities water asset is located to the east of the quarry some 450m from the closest of proposed blasting operations. As detailed within this blast vibration report, based on the vibration decay characteristics for this rock type, which will be verified via an initial test blast at the site, the predicted vibration level on the ground surface above the asset at a 50% confidence level is 1.3 mms^{-1} and 4.5 mms^{-1} at an upper 99.9% confidence level based on an anticipated maximum instantaneous explosive charge weight of 96 kg.

9.19 In terms of relevant guidance, National Grid Gas within their document "The protection of Steel Pipelines operating at pressures above 7 bar" T/SP/GM/4 dated October 2015 suggest that a peak particle velocity of 75 mms^{-1} shall apply at pipelines. Guidance from the Institute of Gas Engineers and Managers suggest that for Welded steel or PE plant, the peak particle velocity at the plant should be limited to 75 mms^{-1}. On a ductile or cast iron pipeline, the peak particle velocity should not exceed 25 mms^{-1}.

9.20 In conclusion, the worst case predicted vibration level of 4.5 mms^{-1} therefore complies with the most conservative criterion from the above and is considered safe for the integrity of the United Utilities watermain asset.

9.21 Further consultation correspondence from UU in March 2020 revealed that there was a further asset comprising an underground service reservoir, which is located some 470m from the proposed north eastern quarry void. Vibrock have also assessed the potential effects on this asset from blasting.

9.22 A worst case assessment of ground vibration levels utilising a maximum instantaneous explosive charge weight of 96 kg would result in a vibration level of 1.2 mms^{-1} at a 50% confidence level and 4.2 mms^{-1} at an upper 99.9% confidence level.

9.23 Ground vibration of such magnitude is within the criteria recommended for reinforced or framed structures, industrial and heavy commercial buildings for the prevention of cosmetic type damage from BS 7385-2:1993. The predicted levels of ground vibration are therefore considered safe for the integrity of a heavily engineered structure such as the Service Reservoir.

Blasting and the B5301

9.24 The B5031 runs to the west of the quarry. Highways England have produced a document "Manual of Contract Documents for Highway Works". Within this document it is specified that structures or earthworks, existing or under construction should not exceed a peak particle velocity of 50 mms^{-1} from blast operations.

9.25 Based on the blast regression data for this study, which will be confirmed via a site specific regression line to be developed from a test blast, charge reduction techniques of the assessed 96kg would have to be adopted within 67 metres of the road in order to attain the recommended vibration criterion. The allowable maximum instantaneous explosive charge sizes for the recommended vibration criterion are detailed within Table 1.2.

Monitoring and Control of the Environmental Affects of Blasting

9.26 A Blast Monitoring Scheme will be prepared by the operator as a condition of the planning permission. The Scheme will detail the monitoring procedure to be adopted by the quarry operator to demonstrate compliance with the recommended vibration criteria at the closest residential receptors and at the gas pipeline.

9.27 The blasting frequency at the site is likely to be infrequent (in the order of one blast per week) and would take place during the hours of 09:00 to 17:00 Monday to Friday. Monitoring of ground vibration and air overpressure will be undertaken, with the blast design modified as required in order to comply with the recommended vibration criteria.

9.28 As detailed within Section 5.9 British Standard 6472–2: 2008 - Guide to evaluation of human exposure to vibration in buildings: Part 2: Blast-induced vibration, has been written to specifically address the human exposure to blast induced vibration. The standard states that "For blast vibration occurring up to three times per day, the generally accepted maximum satisfactory magnitude for residential premises is a ppv of 6 mms^{-1}. However, when 6.0 mms^{-1} is considered to be too restrictive a value of between 6.0 mms^{-1} and 10 mms^{-1} could be used. All predicted vibration levels at the assessed receptors fall within this range and therefore comply with the Standard.

10.0 CONCLUSIONS

10.1 A criterion for restricting vibration levels from production blasting has been recommended in order to address the need to minimise annoyance to nearby residents. Accordingly, Vibrock recommends a vibration criterion of 6 mms^{-1} for 95% of events with a maximum vibration limit of 12 mms^{-1} as a satisfactory magnitude for vibration from blasting at High Close Quarry.

10.2 All blasts at High Close Quarry shall be designed in order to comply to a vibration criteria of 6 mms^{-1} peak particle velocity at a 95% confidence level as measured in any of the three planes of measurement.

10.3 All vibration will be of a low order of magnitude and would be entirely safe with respect to the possibility of the most cosmetic of plaster cracks as detailed within British Standard 7385-2: 1993.

10.4 Vibration will also be within those levels recommended for blast induced vibration and human perception as being satisfactory within the previously discussed British Standard Guide BS 6472-2: 2008.

10.5 With such low ground vibration levels accompanying air overpressure would also be of a very low and hence safe level, although possibly perceptible on occasions at the closest of properties.

10.6 Thomas Armstrong Limited will follow the recommendations given. There is no reason why blasting operations within the extraction area at High Close Quarry will give rise to adverse comment due to induced vibration at any of the dwellings or structures in the vicinity.

10.7 Appendix B details correspondence from Allerdale Borough Council's Environmental Health Officer which confirms his acceptance that the Vibrock blast vibration report adequately addresses concerns relating to the environmental impact of the scheme.

11.0 RECOMMENDATIONS

11.1 The following recommendations are presented in order to minimise the vibration impact of blasting operations from High Close Quarry to nearby residents.

Ground Vibration - Inhabited Property

11.2 We recommend that a ground vibration limit is chosen that not only is perfectly safe for the integrity of structures, but also takes into account the physiological effects on adjacent neighbours. As such we recommend a vibration limit of 6 mms^{-1} peak particle velocity with an upper limit of 12 mms^{-1}. The limit of 6 mms^{-1} is successful current practice at numerous similar open pit workings within the United Kingdom and also agrees with the relevant British Standards 6472-2: 2008 and BS 7385-2: 1993.

Air Overpressure

11.3 Our considerable past experience of air overpressure measurement and control leads us to the firm conclusion that it is totally impracticable to set a maximum air overpressure limit, with or without an appropriate percentile of exceedances being allowed, simply because of the significant and unpredictable effect of variable weather conditions. This point is recognised by the DETR Publication The Environmental Effects of Production Blasting from Surface Mineral Workings and British Standard 6472-2: 2008.

11.4 With a sensible ground vibration limitation the economics of safe and efficient blasting will automatically ensure that air overpressures are kept to reasonable levels.

11.5 We therefore recommend that in line with the current best accepted modern practice in the extraction industries, that safe and practical measures are adopted that ensure the minimisation of air overpressure generated by blasting at source, considering such factors as initiation technique. The mineral operator should submit methods to minimise air overpressure to the Mineral Planning Authority for approval.

Monitoring and Control

11.6 The mineral operator should design blasting operations taking into account the findings of this report. At the commencement of mineral extraction operations, the first blast shall be deemed a test blast from which a site specific regression line shall be derived, it is this site specific line which should be interpreted when designing blasting operations at the site. When blasts are designed at the site the separation distance to the closest vibration sensitive receptors should be established to ensure that the maximum instantaneous explosive charge weight utilised will comply with the relevant vibration criterion.

11.7 A programme of blast monitoring should be implemented. The results of such monitoring will indicate whether or not there is compliance with the vibration criteria and they can also be used to continually update the regression analysis and thus provide valuable input to the design of future blasts.

11.8 With the above control recommendations implemented and the exercise of reasonable engineering control over quarry blasting operations, it is envisaged that the quarry will work within the vibration criteria and without undue annoyance to local residents.

12.0 REFERENCES

1. BS ISO 4866: 2010. Mechanical vibration and shock – Vibration of fixed structures – Guidelines for the measurement of vibrations and evaluation of their effects on structures. British Standards Institution.

2. BS 6472-2: 2008. Guide to evaluation of human exposure to vibration in buildings, Part 2: Blast-induced vibration. British Standards Institution.

3. BS 7385: 1993 Evaluation and measurement for vibration in buildings: Part 2. Guide to damage levels from groundborne vibration. British Standards Institution.

4. BS 5228-2: 2009 + A1:2014, Code of practice for noise and vibration control on construction and open sites – Part 2: Vibration

5. Planning Practice Guidance to the National Planning Policy Framework, 2014, Department for Communities and Local Government.

6. Minerals Planning Guidance Note No. 9, 1992 Planning and Compensation Act 1991: Interim Development Order Permissions (IDOS) - Conditions. Department of the Environment, Welsh Office.

7. Minerals Planning Guidance Note No. 14, 1995 Environment Act 1995: Review of Mineral Planning Permissions. Department of the Environment, Welsh Office.

8. The Environmental Effects of Production Blasting from Surface Mineral Workings, Vibrock Report on behalf of the DETR, 1998.

TABLE 1.1

ALLOWABLE MAXIMUM INSTANTANEOUS EXPLOSIVE CHARGE WEIGHTS – INHABITED PROPERTY AT HIGH CLOSE QUARRY

From the regression line the corresponding scaled distance value for a vibration criterion of 6 mms^{-1} at a 95% confidence level is 22.93 $mkg^{-½}$.

This gives rise to the following allowable maximum instantaneous charge weights at the given blast/receiver separation distances:-

Blast/Receiver Separation Distance (metres)	**Allowable Maximum Instantaneous Charge Weight, kg to comply with 6 mms^{-1} at 95% confidence level**
200	76
250	118
300	171
350	232
400	304
450	385
500	475
550	575
600	684

TABLE 1.2

ALLOWABLE MAXIMUM INSTANTANEOUS EXPLOSIVE CHARGE WEIGHTS – B5301 AT HIGH CLOSE QUARRY

From the regression line the corresponding scaled distance value for a vibration criterion of 50 mms^{-1} at a 99.9% confidence level is 6.15 $mkg^{-½}$.

This gives rise to the following allowable maximum instantaneous charge weights at the given blast/receiver separation distances:-

Blast/Receiver Separation Distance (metres)	Allowable Maximum Instantaneous Charge Weight, kg to comply with 50 mms^{-1} at 99.9% confidence level
20	8
30	19
40	34
50	53
60	76
70	104
80	136

TABLE 2

PREDICTED VIBRATION LEVELS
MINERAL EXTRACTION AREA AT HIGH CLOSE QUARRY

Considering a maximum instantaneous charge weight of 96 kg utilised at the nearest distance of approach to the location considered, the predicted vibration levels are as follows:-

Location	Vibration Level Peak Particle Velocity (mms^{-1})	
	Mean (50%)	Maximum (95%)
1	1.1	2.2
2	0.9	1.8
3	0.9	1.8
4	0.6	1.2
5	3.0*	6.0*
6	0.7	1.4

* to be achieved through a reduction of the maximum instantaneous charge weight.

<u>Locations</u>

1. Parsonby Farm
2. The Muslins
3. Adam's Ghyll
4. Eweclose
5. High Close Farm
6. Plumbland C of E School

FIGURE 1

PREDICTION LOCATIONS

1. Parsonby Farm
2. The Muslins
3. Adam's Ghyll
4. Eweclose
5. High Close Farm
6. Plumbland C of E School

APPENDIX A – NORTHERN GAS NETWORKS RESPONSE

Peter

Hope you are all well

Blasting Stand - Off Distance Northern Gas Objection: Planning Application 2/19/9010 + 9011 High Close Quarry, High Close Farm, Plumbland, Aspatria, Wigton, CA7 2HF

We have now received the assessment we commissioned in relation to the blasting report you provided (your doc:- Vibrock: R18. 9449 / 2/ DW).

After deliberating on its contents, we are agreed that a stand off distance of **54 metres** is acceptable.

This is based on the results we have received and the premise that, given your proposed blasting parameters, at this distance, the vibration levels experienced by our pipeline should not be higher than 50 mm/s.
However as part of our agreement, we would like the quarry operators to collect blasting data at our pipeline, at an early stage in the works, in order that this supposition can be verified.
We would also like this vibration level to be monitored periodically as the workings approach the easement, for verification purposes.
(In general, our policy is that blasting vibration monitoring need only be carried out where the expected levels are in excess of 50mm /s at the pipe).

Hopefully you are amenable to the above and thus, please will you indicate your agreement or otherwise to this parameter.

Going forward, I now think that, if this item is agreed by yourselves, then we are in a position to withdraw our objection.

Hope this is acceptable and best wishes.

Donald Gilbank

Network Officer (Pipeline Protection)
Northern Gas Networks
Mobile: +44 (0) 7721 610278
www.northerngasnetworks.co.uk
facebook.com/northerngasnetworks
twitter.com/ngngas
dgilbank@northerngas.co.uk

APPENDIX B – ALLERDALE BOROUGH COUNCIL EHO RESPONSE

Our Ref: EPA1990 S79
Your Ref: High Close Quarry Planning Application
This matter is being dealt with by: Ben Crowther
Direct Line: 07817 108921
Email: environmental.health@allerdale.gov.uk

Allerdale borough council
www.allerdale.gov.uk

14th July 2020

Mr Peter Stephenson
Stephenson Halliday
32 Lowther Street
Kendal
LA9 4DH

Dear Mr Stephenson

High Close Quarry, Environmental Protection Act 1990, S79 Part 2A

Allerdale BC and associated consultants have reviewed the information supplied to date. This information comprises the following documents:

High Close Quarry Development; Landfill Quarry Hydrogeological Relationship; for Stephenson Halliday Consultants, Report Ref 2934-R01 by Terraconsult, April 2020.

Vibrock; Assessment of Environmental Impact of Blasting at High Close Quarry, Parsonby, Cumbria, THOMAS ARMSTRONG LIMITED R20.9449/6/DW Date of Report: 07 May 2020.

Vibrock; Air Quality Assessment of Proposed Mineral Extraction Operations at High Close Quarry, Parsonby, Cumbria; for Thomas Armstrong Limited; Ref R20.9448/5/DW Dated 28th May 2020.

Vibrock; Noise Assessment; Proposed Mineral Extraction Operations at High Close Quarry, Parsonby, Cumbria, For Thomas Armstrong Limited, Ref: R20.9447/6/AP Date of Report: 02 June 2020.

> Allerdale BC believe these documents satisfy the requirements of the comments in Richard Cain's Email of 1st November 2019: In that the site could cause a serious environmental incident. Allerdale BC believes the above reports adequately address the concerns voiced regarding mobilisation of material from the former dilute and disperse landfill cell.

In conclusion the Issues raised in the above email are valid, and conditions should be added to any planning application with modifications as detailed in the November email.

Appendix 4, 5 and 6 have been justified. Please add relevant conditions

Appendix 10 has been satisfied; please add relevant conditions.

Conditions: Appendix 11:

Namely contaminated land the Terraconsult report adequately satisfies the requirement for the part 1 of the contaminated land contamination condition. Further reports are required and so these need to be generated and approved. Parts 2, 3 and 4 should remain as conditions.

Please do not hesitate to contact me if you require further information or wish to discuss this matter further.

Yours sincerely

[redacted]

Ben Crowther
Environmental Health Officer
Governance and Regulatory Services

POSITIVE ABOUT DISABLED PEOPLE

INVESTOR IN PEOPLE

Allerdale - a great place to live, work and visit

Allerdale Borough Council
Allerdale House
Workington
Cumbria CA14 3YJ
Tel: 0303 123 1702

APPENDIX 7:
CULTURAL HERITAGE

Economy and Infrastructure
County Offices • Kendal • Cumbria • LA9 4RQ
Tel: 01539 713431

Cumbria County Council

Memorandum

To: Rachel Brophy

From: Jeremy Parsons

Reference: 2/19/9010 & 2/19/9011

Date: 13 September 2019

2/19/9010 - Application for the determination of new planning conditions under the Environment Act 1995 (as amended) for the dormant minerals planning permission reference CA49 incorporating an area for plant, stockpiling and storage
2/19/9011 - New vehicular access to quarry
High Close Quarry, High Close Farm, Plumbland, Aspatria, Wigton
Intradepartmental Consultation – Historic Environment

Thank you for consulting me on the above applications.

The scheme has been amended since the 2017 scoping opinion in that the area of impact of the proposed development no longer includes the buried remains of an Iron Age/Romano-British enclosure. Nevertheless, as I outlined in my response to you to the scoping opinion (dated 08 May 2017), there is also the potential for currently unknown assets of a similar date and significance to survive within the proposed development area, a point that is highlighted in the Environmental Statement. This is based on the occurrence, frequency, and close proximity of a number of important prehistoric remains to the site, including one site which is designated as a scheduled monument.

It is disappointing that the Environmental Statement does not include the results of a geophysical survey, as I requested in the scoping opinion. I consider that this survey is necessary to provide information on the presence /absence and significance of any archaeological assets surviving below ground and how their significance would be impacted upon by the proposed development. *I advise that the survey should be undertaken prior to the determination of the application* and should include those areas of the site that have not been subject to previous extraction. The information provided by a geophysical survey is proportionate to both the significance of the potential assets and to the scale of impact of the proposed development, in line with para 189 of the NPPF. An informed judgement can be made as to whether, in the event planning consent is granted, provisions will need to be included for the preservation of significant archaeological assets in situ and for the recording of assets of lower importance.

Please do not hesitate to contact me if you wish to discuss this matter further.

HCQA17

HIGH CLOSE QUARRY, ASPATRIA, CUMBRIA

Archaeological Desk-Based Assessment

for Stephenson Halliday, on behalf of Thomas Armstrong (Aggregates) Ltd

30 May 2017

revised and updated 28th January 2020 and October 2021

HEADLAND
ARCHAEOLOGY

HIGH CLOSE QUARRY, ASPATRIA, CUMBRIA

ARCHAEOLOGICAL DESK-BASED ASSESSMENT

for Stephenson Halliday, on behalf of Thomas Armstrong (Aggregates) Ltd

30 May 2017

Revised 28th January 2020 and October 2021

HA Job no.:	HCQA17
NGR:	420656,186543
Parish:	Plumbland
Council:	Cumbria

Project Manager:	Tom Janes & Chris Lowe
Author:	Linn Glancy & Sam Fox
Fieldwork:	Sam Fox
Graphics:	Linn Glancy & Sam Fox
Approved by:	Tom Janes & Chris Lowe

CONTENTS

LIST OF ILLUSTRATIONS

HIGH CLOSE QUARRY, ASPATRIA

ARCHAEOLOGICAL DESK-BASED ASSESSMENT

Proposals have been brought forward by Stephenson Halliday, on behalf of Thomas Armstrong (Aggregates) Ltd, to reopen a dormant quarry near High Close Farm, approximately 500m southwest of Plumbland in Cumbria.

There are three known heritage assets within the Inner Study Area (ISA), comprising a cropmark enclosure (HA1) of prehistoric or Romano-British date, a quarry and lime kilns (HA2) dating from the early 19th century or earlier, and areas of possible ridge and furrow cultivation (HA3).The ISA is assessed as an area of medium archaeological potential outwith those areas that have been previously quarried. Therefore, there is a risk of direct impacts upon previously unrecorded archaeological deposits.

Further site investigation will be required in order to determine the nature and extent of any potential deposits, and to assess the magnitude and significance of potential impacts upon them.

One scheduled monument (SM1007198) was identified within the Study Area and considered for potential setting impacts. The proposed development will have no significant impacts upon the setting of this monument.

This assessment was updated in January 2020 to recognise that the English Lake District was inscribed as a World Heritage Site on the 9th July 2017. Potential impacts on the Outstanding Universal Values from the proposed development were considered, no significant impacts are predicted.

1 INTRODUCTION

1.1 Planning Background

The site is located at High Close farm, approximately 500m to the south-southwest of the village of Plumbland in Cumbria. Stephenson Halliday, on behalf of Thomas Armstrong (Aggregates) Ltd, are preparing an application for the determination of conditions and a working and restoration scheme under the Environment Act 1995 to which the dormant minerals planning permission reference CA49 is to be subject. The whole permission area is shown on Figure 1. Within the dormant permission area, an area for the quarrying of limestone has been identified, plus areas that will be potentially disturbed as a result of plant and stock-piling (Figure 1).

The Lake District National Park Authority (LDNPA) responded to the 2019 application on the 18th October 2019, they stated that the original DBA did not refer to the World Heritage Site and that as a minimum the extent to which Attributes of Outstanding Universal Value could be impacted along with their setting should be identified and considered as part of this assessment.

At the time of originally writing this assessment the Lake District had not yet been listed as a World Heritage Site hence it not being included. This revised and updated DBA recognises this change and assesses the potential for impacts on the Outstanding Universal Value of the Lake District National Park Authority.

1.2 Consultation

No formal consultation with historic environment organisations has taken place to inform this DBA. However, the Cumbria County Council (CCC) Historic Environment Service was contacted in order to obtain a digital data extract from the Historic Environment Record (HER), and a visit was made in April 2017 to the HER in order to study aerial photographs (Table 7).

In his scoping response, dated 8 May 2017, the Council’s Historic Environment officer recommended that an archaeological desk-based assessment and a geophysical survey of areas outwith the area previously quarried would help clarify how the significance of any archaeological assets that may survive below ground would be impacted upon by the development. This would then inform whether provisions will be required to preserve significant archaeological assets *in situ* and for the recording of assets of lesser importance.

2 POLICY AND GUIDANCE

The assessment has been undertaken with reference to relevant legislation, policy and guidance relating to Cultural Heritage.

2.1 Legislation

Scheduled Monuments and Listed Buildings are protected by statute. Legislation regarding Scheduled Monuments is contained within The Ancient Monuments and Archaeological Areas Act 1979. Legislation regarding Listed Buildings is contained in The Planning (Listed Buildings and Conservation Areas) Act 1990. Under this legislation it is an offence to carry out works which affect the fabric of a Scheduled Monument or Listed Building without the prior written consent of the Secretary of State.

The 1979 Act makes no reference to the settings of Scheduled Monuments. However, with regard to Listed Buildings, Section 66 of the 1990 Act states (in part):

> *"In considering whether to grant planning permission for development which affects a listed building or its setting, the local planning authority or, as the case may be, the Secretary of State shall have special regard to the desirability of preserving the building or its setting".*

The 1990 Act also places a duty on planning authorities with regard to Conservation Areas, requiring that:

> *"Special attention shall be paid to the desirability of preserving or enhancing the character or appearance of that area".*

No other types of heritage asset are protected or controlled by statute.

2.2 Planning Policy

National Planning Policy in England is set out in the National Planning Policy Framework (NPPF) published in March 2012 and updated in July 2018 and again in February 2019. Policies affecting cultural heritage are set out in section 16 (paragraphs 184-202) of the NPPF. The policies in the NPPF are a material consideration that must be taken into account in development management decisions and in development of Local Plans, where relevant. Therefore, the development management policies in the NPPF can be applied directly by the decision-maker when determining whether development should proceed.

Heritage assets are defined in Paragraph 184 as assets that "*range from sites and buildings of local historic value to those of the highest significance, such as World Heritage Sites which are internationally recognised to be of Outstanding Universal Value. These assets are an irreplaceable resource, and should be conserved in a manner appropriate to their significance, so that they can be enjoyed for their contribution to the quality of life of existing and future generations."*

The NPPF supports a presumption in favour of sustainable development and sets out the definitions of sustainability including conserving and enhancing the historic environment. Paragraph 192 of the NPPF states that

> *"In determining planning applications, local planning authorities should take account of:*
>
> a. *The desirability of sustaining or enhancing the significance of heritage assets and putting them to viable uses consistent with their conservation*
>
> b. *The positive contribution that conservation of heritage assets can make to sustainable communities including their economic vitality; and*
>
> c. *The desirability of new development making a positive contribution to local character and distinctiveness"*

Paragraph 193 states that "*great weight*" should be given to the conservation of the significance of designated heritage assets and "*the more important the asset, the greater the weight should be*". It also states that the weight given to the conservation of a heritage asset is irrespective of the degree of any potential harm to its significance.

Paragraphs 194-197 set out the policy tests for different levels of harm to the significance of heritage assets of differing levels of importance. For designated heritage assets, paragraph 194 states that "*any harm to, or loss of"* significance requires *"clear and convincing justification*" and that "*substantial harm to or loss of:*

(a) grade II listed buildings or grade II registered parks or gardens should be exceptional;

(b) assets of the highest significance, notably scheduled monuments, protected wreck sites, battlefields, grade I and II listed buildings, grade I and II* registered parks and gardens, and World Heritage Sites, should be wholly exceptional*".

Paragraph 195 states that proposals leading to substantial harm to designated heritage assets should be refused consent unless it can be demonstrated that the harm or loss is necessary to achieve substantial public benefits that outweigh that harm or loss, or where all the following apply:

> *a) the nature of the heritage asset prevents all reasonable uses of the site; and*
> *b) no viable use of the heritage asset itself can be found in the medium term through appropriate marketing that will enable its conservation; and*
> *c) conservation by grant-funding or some form of not for profit, charitable or public ownership is demonstrably not possible; and*
> *d) the harm or loss is outweighed by the benefit of bringing the site back into use.*

Where a development proposal would lead to less than substantial harm to a designated heritage asset Paragraph 196 requires that "*this harm should be weighed against the public benefits of the proposal".* Similarly, Paragraph 197 states that "*In weighing applications that directly or indirectly affect non-designated heritage assets, a balanced judgement will be required having regard to the scale of any harm or loss and the significance of the heritage asset*".

2.3 Guidance

Planning Practice Guidance (PPG) is published by the Department for Communities and Local Government (DCLG) to help practitioners implement NPPF policies. The PPG relating to cultural heritage is included in Section 18a 'Conserving and enhancing the historic environment'.

Historic England publishes a series of Good Practice Advice documents, which includes 'Managing Significance in Decision-Taking in the Historic Environment' (GPA2) and 'The Setting of Heritage Assets' (GPA3).

Historic England Advice Notes provide further detailed advice on how to implement national planning policy and guidance. The following Advice Notes is relevant to this assessment: Mineral Extraction and Archaeology: A Practice Guide

Standards and Guidance published by the Chartered Institute for Archaeologists (CIfA) have been followed in preparing this assessment, in particular the 'Standard and guidance for commissioning work or providing consultancy advice on archaeology and the historic environment' (2014) and the 'Standard and guidance for historic environment desk-based assessment' (2014).

The LDNPA has produced a guidance document 'Heritage assessment and information requirements' for applications received on or after 1 January 2018. This guidance covers a guide to what are heritage assets and heritage information requirements. Included in these requirements is the World Heritage Site Checklist which should be completed and used to identify which attribute(s), if any, are relevant to the proposal and how these impacts would affect the significance of the World Heritage Site.

The assessment has been carried out according to the *Standard and guidance for historic environment desk-based assessment* published by the Chartered Institute for Archaeologists (CIfA 2014), and aims to:

- Collate all available written, graphic, photographic and electronic information relevant to the development site;
- Describe the nature, extent and significance of the historic environment within the area potentially affected by the development, identifying any uncertainties in existing knowledge;
- Determine the potential impact of the proposed development; and
- Identify any requirements for further investigation that may be necessary to understand the effects of the proposed development on the historic environment.

Potential impacts of the proposed development are most likely to relate to the disturbance of buried archaeology during excavation of the quarry. Potential impacts on the English Lake District World Heritage Site will also be considered.

3 METHODOLOGY

3.1 Study areas

The Inner Study Area (ISA) corresponds to the dormant planning permission boundary (ref. CA49) in order to include any known or unknown heritage assets at risk of direct and indirect impacts.

The Outer Study Area (OSA) extends 500m beyond the dormant planning permission boundary, so as to include any heritage assets that may continue into the site, or which may be affected by indirect impacts or impacts on assets' settings.

3.2 Data sources

The assessment has been based on a study of all readily available documentary sources, following the CIfA Standards and Guidance (CIfA 2014). The following sources of information were referred to:

- Designation data from the National Heritage List for England, downloaded from the Historic England website on 28th January 2020;
- Descriptions of designated heritage assets in the National Heritage List for England, viewed on the Historic England website;
- Archaeological and architectural records from the National Record of the Historic Environment, viewed through the Heritage Gateway website (www.heritagegateway.org.uk);
- Archaeological records and aerial photographs held by Cumbria County Council HER – digital HER extract received 7th April 2017 and update received on 16th January 2020;
- Historic Landscape Characterisation;
- Historic maps and plans held in the Cumbria Country Council Archives ;
- Environment Agency LiDAR data;
- Geological data available online from the British Geological Survey;
- Readily available published sources and unpublished archaeological reports.

3.3 Identification of heritage assets

The assessment aims to identify all known heritage assets potentially affected by the proposed development, and to estimate the potential for currently unknown heritage assets. A heritage asset is defined in the National Planning Policy Framework (NPPF) (Annex 2) as 'a building, monument, site, place, area or landscape identified as having a degree of significance meriting consideration in planning decisions, because of its heritage interest'. Both discrete features, and extensive landscapes defined by a specific historic event, process or theme, can be defined as heritage assets; and assets may overlap or be nested within one another. Some heritage assets are designated as Scheduled Monuments, Listed Buildings, World Heritage Sites, Conservation Areas, Registered Parks and Gardens, Registered Battlefields, or locally designated through policies in the Local Plan. Undesignated assets may be recorded in Historic Environment Records, while many other assets are currently unrecorded.

Heritage assets within the ISA are shown in Figure 1, with detailed descriptions compiled in a gazetteer (Appendix 1). Assets within the ISA have been assigned an Asset number (prefixed HA for Heritage Asset). A single asset number can refer to a group of related features, which may be recorded separately in the HER and other data sources.

3.4 Assessment of heritage significance and importance

Heritage assets are assessed in terms of their significance and importance, following the requirement in NPPF paragraph 189, and taking account of Historic England's guidance in *Managing Significance in Decision-Taking in the Historic Environment* (GPA2). Significance, in relation to heritage policy, is defined by the NPPF (Glossary, Annex 2) as

> *"the value of a heritage asset to this and future generations because of its heritage interest. That interest may be archaeological, architectural, artistic or historic. Significance derives not only from a heritage asset's physical presence, but also from its setting."*

Setting is defined in Annex 2 of the NPPF as:

> *“the surroundings in which an asset is experienced. All heritage assets have a setting, irrespective of the form in which they survive and whether they are designated or not. Elements of a setting may make a positive or negative contribution to the significance of an asset, may affect the ability to appreciate that significance, or may be neutral.”*

Where potential impacts on the settings of a heritage assets are identified, the assessment of significance includes ‘assessing whether, how and to what degree these settings make a contribution to the significance of the heritage asset(s)’, following Step 2 of the staged approach to setting recommended in Historic England’s guidance in The Setting of Heritage Assets (GPA3). Attributes of an asset’s setting which can contribute to its significance are listed on page 9 of GPA3.

The *importance* of a heritage asset is the overall value assigned to it based on its heritage significance, reflecting its statutory designation or, in the case of undesignated assets, the professional judgement of the assessor (Table 1). Historic England guidance also refers to an asset’s ‘level of significance’ (GPA2, paragraph 10), which in this usage has the same meaning as importance. Nationally and internationally designated assets are assigned to the highest two levels of importance. Grade II Listed Buildings and Grade II Registered Parks & Gardens are considered of medium importance, reflecting the lower level of policy protection provided by the NPPF. Conservation Areas are not assigned to either level of importance by the NPPF but their status as local designations and their omission from the National Heritage List justifies their classification here as assets of medium importance. Other non-designated assets which are considered of local importance only are assigned to a low level of importance. Following the NPPF (Annex 2), a historic feature which lacks ‘a degree of significance meriting consideration in planning decisions, because of its heritage interest’ is not considered to be a heritage asset; it may also be said to have negligible heritage importance.

Table 1: Criteria for Assessing the Importance of Heritage Assets

Importance of the asset	**Criteria**
Very high	World Heritage Sites and other assets of equal international importance
High	Grade I and II* Registered Parks and Gardens, Scheduled Monuments, Protected Wreck Sites, Registered Battlefields, Grade I and II* Listed Buildings, and undesignated heritage assets of equal importance
Medium	Conservation Areas, Grade II Registered Parks and Gardens, Grade II Listed Buildings, heritage assets on local lists and undesignated assets of equal importance
Low	Undesignated heritage assets of lesser importance

3.5 Potential for unknown heritage assets

Archaeological features are often impossible to identify through desk-based assessment. The likelihood that significant undiscovered heritage assets may be present within the ISA is referred to as *archaeological potential*. Overall levels of potential can be assigned to different landscape zones, following the criteria in Table 2, while recognising that the archaeological potential of any zone will relate to particular historical periods and types of evidence. The following factors are considered when assessing archaeological potential:

- The distribution and character of known archaeological remains in the vicinity, based principally on an appraisal of data in the HER;
- The history of archaeological fieldwork and research in the surrounding area, which may give an indication of the reliability and completeness of existing records;
- Environmental factors such as geology, topography and soil quality, which would have influenced land-use in the past and can therefore be used to predict the distribution of archaeological remains;
- Land-use factors affecting the survival of archaeological remains, such as ploughing or commercial forestry planting; and
- Factors affecting the visibility of archaeological remains, which may relate to both environment and land-use, such as soils and geology (which may be more or less conducive to formation of cropmarks), arable cultivation (which has potential to show cropmarks and create surface artefact scatters), vegetation, which can conceal upstanding features, and superficial deposits such as peat and alluvium which can mask archaeological features.

Table 2: Archaeological potential

Potential	Definition
High	Undiscovered heritage assets of high or medium importance are likely to be present.
Medium	Undiscovered heritage assets of low importance are likely to be present; and it is possible, though unlikely, that assets of high or medium importance may also be present.
Low	The study area may contain undiscovered heritage assets, but these are unlikely to be numerous and are highly unlikely to include assets of high or medium importance.
Negligible	The study area is highly unlikely to contain undiscovered heritage assets of any level of importance.
Nil	There is no possibility of undiscovered heritage assets existing within the study area.

4 RESULTS

4.1 Overview of the historic environment

Previous investigations

There are no records in the HER of any previous investigations within the ISA. For the surrounding Outer Study Area there is one record (HER Event 2/08/1901), relating to a 2008 building recording survey project at Adam's Gill, Plumbland. This investigation focused on the architectural interest of the buildings at Adams Gill, and is not relevant to our understanding of the known or potential archaeology for the current study area.

Both the Inner and Outer Study Areas have been covered in the National Mapping Programme (NMP) by Historic England (formerly English Heritage). This is a long-term project which aims to identify and map England’s historic landscape through aerial photography, remote sensing and other forms of aerial data collection. Two cropmark sites in the OSA have been identified through the NMP; a possible rectilinear enclosure near Threapland (SMR 44481) and a ditch (SMR 44482) located approximately 240m to the south (Figure 2).

Geology and geomorphology

The majority of the underlying geology of the ISA comprises limestone. A thin strip of sandstone, siltstone and mudstone bedrock runs from north to south through the ISA close to its western boundary. The bedrock was formed during the Paleozoic Era and suggests that the ISA was under water before sea level changes in the Mesozoic Era. The bedrock is overlain by superficial deposits of diamicton till which would have been deposited as glaciers scoured the landscape before the Holocene.

Prehistoric & Roman

One heritage asset (HA1) within the ISA dates to the prehistoric period. The monument survives as buried archaeological deposits which form a cropmark on aerial photographs (NY1437/A). The cropmark appears to show a large circular enclosure with an entrance on its western side. The enclosure is truncated on its northern side by an existing field boundary. The presence of the monument is confirmed by LiDAR data held by the Environment Agency, and is visible on Hillshade models as a low circular ditch measuring approximately 65m in diameter with a western entrance. The date of this monument cannot be determined with certainty but its form is similar to Late Bronze Age or Iron Age enclosures. It should be noted that other circular enclosed settlements present within the Outer Study Area, such as the Scheduled settlement east of Eweclose (List1007198), suggest it may also date to the Romano-British period. This monument comprises a Romano-British settlement enclosure situated on the northwest-facing slope of a low ridge, which runs from north to south roughly parallel with the B5301 road.

There are a number of additional cropmark sites present throughout the OSA (Figure 2) which have a similar form to Iron Age or Romano-British sites, including a rectilinear enclosure (SMR 44481) and linear ditch (SMR 44482) to the south of Threapland. The presence of Iron Age or Romano-British sites in the OSA suggests that deposits or features of this period may be present within the ISA.

Medieval

On the basis of documentary sources, the HER records the site of a medieval beacon (SMR 5321) in the vicinity of the scheduled Romano-British settlement east of Eweclose (List1007198). In addition, ridge and furrow cultivation remains (SMR 41104) to the west of the ISA are identified in the HER as examples of medieval cultivation.

Post-medieval & Modern

There are a number of sites within the Inner and Outer Study Areas which date to the post-medieval period. These primarily relate to industrial activities. The High Close Quarries and Lime Kilns (HA2) are recorded in the HER, and are within the northern section of the ISA (Figure 1). There are additional quarries and lime kilns just to the north of the ISA, located to the east (10795) and west (10799) of Parsonby, and two more quarries and lime kilns at Wardhall Common (10728 & 10793) are recorded on 19th-century mapping by the Ordnance Survey.

Historic satellite imagery on Google Earth (2011) suggests that two areas of medieval or post-medieval ridge and furrow cultivation (HA3) may be present within the south-east quadrant of the ISA. Its possible extent is indicated on Figure 1 but it does not survive as an upstanding feature.

The area is first mapped in detail on the Plumbland parish tithe map and award (Carlisle Archives: DRC/8/153). According to the award, the land within the ISA was then under the ownership of Sir Wilfred Lawson, tenanted by a Joseph Harris. The award map notes that the field within which the dormant quarry is located, forming the east side HA2 and immediately adjacent to High Close Farm, was in use for quarrying and lime kilns in 1850. The quarry is mapped in detail on the 1st and 2nd Edition Ordnance Survey Six-Inch maps.

4.2 Assessment of heritage significance

Known heritage assets within the Inner Study Area

HA1 is a cropmark enclosure of later prehistoric or Romano-British date and of medium importance, a surviving fragment of similarly-dated features in the wider landscape (eg. cropmark sites SMR 44481 & SMR 44482). The documented quarry and limekilns (HA2) and possible ridge and furrow cultivation remains (HA3) are both common features of the post-medieval landscape and are considered to be of low importance.

Table 3: Heritage assets within the Inner Study Area

Asset no.	Asset name	Period	Importance
HA1	Cropmark, circular enclosure	Prehistoric or Romano-British	Medium
HA2	High Close Quarries and lime kilns	Post-medieval	Low
HA3	Ridge and furrow cultivation remains	Post-medieval	Low

Archaeological potential of the Inner Study Area

The presence of known cropmarks of prehistoric or Romano-British date in and adjacent to the ISA (HA1 and sites SMR 44481 / SMR 44482 respectively) and upstanding remains of similar date (SM-1007198) in the vicinity indicate that the ISA, excluding areas of documented quarrying, is of medium archaeological potential.

HA2 is recorded as two areas (Figure 1) in the HER. Documentary and map evidence indicate that the eastern side of HA2 has been removed by quarrying and archaeological potential here will be nil. However, the extent to which the western side of HA2 within the ISA has been removed by quarrying is uncertain, and the archaeological potential here will vary from nil – where deposits have been completely removed by quarrying – to medium where the ground has not been quarried.

Heritage assets in the Outer Study area

Scheduled Monuments

There is one Scheduled Monument within the Study Area, a Romano-British settlement located east of Eweclose (List1007198). The site comprises hut circles within a circular enclosure, surrounded by clearance cairns.

Table 4: Scheduled Monuments included in the assessment

List Entry no.	Name	Grid reference
1007198	Settlement, 450m east of Eweclose	314072, 537996

Non-designated assets

Non-designated assets in the Outer Study Area are listed in Table 5 and depicted on Figure 2.

Table 5: Non-designated heritage assets included in the assessment

SMR no.	Name	East	North
SMR 851	Ewe Close Enclosure, Plumbland	314031	537960
SMR 5321	Ewe Close Beacon, Plumbland	314070	537989
SMR 10650	Plumbland Cottage	315100	537910
SMR 10728	Wardhall Quarries	313634	538224
SMR 10793	Wardhall Common Quarry and Lime Kiln	314628	537466
SMR 10795	Parsonby Farm Quarries and Lime Kiln	314589	538868
SMR 10799	Parsonby Quarry	313954	538726
SMR 10800	Parsonby Forge	314295	538909
SMR 41103	Wardhall Common Ridge and Furrow, Plumbland	313996	537413
SMR 41104	Wardhall Enclosures, Plumbland	314176	537985
SMR 42090	Adam's Gill, Plumbland	315007	538692
SMR 44481	Threapland Gill Rectilinear Enclosure	315618	537974
SMR 44482	Threapland Gill Ditch Cropmark	315682	537676

The above sites have been used to characterise the archaeology of the area and evaluate the archaeological potential of the Inner Study Area. No impacts on their setting are anticipated.

Assets Beyond the OSA with Potential for Impacts

The northern edge of the English Lake District World Heritage Site (WHS) is approximately 1.2km to the south of the ISA (Figure 2). As a WHS this is an area of very high importance. The Lake District was inscribed as a WHS by UNESCO in 2017, meeting three of the selection criteria for Outstanding Universal Value (OUV);

1. A landscape of exceptional beauty, shaped by persistent and distinctive agro-pastoral traditions which give it special character;
2. A landscape which has inspired artistic and literary movements and generated ideas about landscapes that have had global influence and left their physical mark;
3. A landscape which has been the catalyst for key developments in the national and international protection of landscapes. (LDNP, Heritage Assessment and information requirements)

5 PREDICTED EFFECTS OF THE DEVELOPMENT

Potential Impacts

Potential impacts arising from the proposed development include direct impacts involving disturbance or removal of heritage assets by quarrying and related groundworks and setting impacts arising from changes to the setting of assets and any key views from and towards such assets.

Predicted Direct Impacts

The later prehistoric or Romano-British cropmark site (HA1) and the nearby areas of ridge-and-furrow cultivation remains (HA3) will be wholly avoided by the proposed re-opening of the limestone quarry and the adjacent areas that may be disturbed as a result of plant or stock-piling. Both features will therefore be preserved *in situ*.

It is possible that part of the area of historic quarrying and lime-kilns (HA2) will be disturbed as a result of plant or stock-piling activities in the area to the west of the re-opened quarry.

With the exception of the documented quarry along the east side of HA2 – where the archaeological potential is nil – the ISA is assessed as an area of medium archaeological potential. Any archaeological deposits that may survive as buried remains within those parts of the ISA that may be potentially disturbed as a result of plant or stock-piling will also be at risk of removal as a result of the proposed development.

Predicted Setting Impacts

A 500m Outer Study Area has been defined for the assessment of potential impacts upon all heritage assets as a result of development within their settings. This is considered appropriate, as due to the nature of the proposed development it is unlikely that significant effects would occur beyond this distance.

Non-designated heritage assets identified in the OSA are presented in Table 5 and have been used to characterise the archaeology of the area. A stage 1 screening exercise, in accordance with *Managing Chane in the Historic Environment: Setting* (HES 016, updated 2020), has identified no non-designated heritage assets in the OSA whose setting contributes to their significance which includes the site. No impacts on their setting are anticipated.

There are no listed buildings in the Outer Study Area. One designated heritage asset (1007198) is recorded within the Outer Study Area. The scheduled monument is located on the north-western slope of the ridge, with principal views to the west and north-west; meanwhile views of the ISA from the archaeological site are restricted by the presence of an intervening forestry shelter belt. No impacts on the setting of the scheduled monument are anticipated as a result of the reopening of the quarry.

The proposed development has the potential to impact on the special qualities of the National Park and the Outstanding Universal Value of the WHS as the removal of a green field area has the potential to remove some of the scenic quality of the area which contributes to OUV Criteria 1. It appears unlikely that the quarry would affect any attributes of the OUV Criteria 2 & 3. Given the location of the proposed development 1.2km to the north west of the edge of the WHS and the history of quarrying in the wider area including the operational Moota Quarry to the south west of the ISA it is considered that any impact on the setting of the WHS is unlikely to be significant.

As no potential significant setting impacts upon heritage assets have been identified, there is no potential for cumulative effects.

6 CONCLUSIONS

Part of an area of historic quarrying and lime-kilns (HA2) would be potentially affected as a result of plant or stock-piling activities; there is also potential for direct impacts upon currently unrecorded archaeological features within those areas of the ISA which may be potentially disturbed as a result of plant or stock-piling.

The potential for impacts on the WHS OUV has been considered. It is considered unlikely that any significant effects on the OUV would occur from the building and operation of the proposed quarry.

Mitigation

Mitigation will be required to clarify the presence and extent of lime-kilns or associated features in HA2, as well as any previously unrecorded archaeological deposits within those areas of the development that may be disturbed as a result of plant or stock-piling activities.

As noted in the Council’s scoping response, an initial programme of geophysical survey would provide a rapid assessment of the archaeological potential of the relevant areas within the dormant planning permission boundary that may be affected by the proposed development and help define the scope of any programme of targeted trial trench evaluation of any geophysical anomalies identified.

7 REFERENCES

Bibliographic references

Brennand, M. 2006, The Archaeology of North West England: An Archaeological Research Framework for the North West Region, CBA North West

Chris Blandford Associates 2008, *Landscape Character Assessment and Guidelines,* Lake District National Park

Headland Archaeology Ltd., 1999, Bothel Quarry, Cumbria: Results of an Archaeological Evaluation Phase 1

Headland Archaeology Ltd., 2006, Archaeological Evaluation at Bothel Quarry, Cumbria: Phase 2

North Pennines Archaeology Ltd., 2008, Report on an Archaeological Building Recording Project at Adam's Gill, Plumbland

Historic maps

Plumbland Tithe Map and Award, 1850, held at Carlisle Archive Centre (shelfmark DRC/8/153)

Ordnance Survey Mapping:

1st Edition 6-Inch Series, 1867-8, *Cumberland XXXVI & XLVI*

2nd Edition 6-Inch Series, 1901, *Cumberland XXXVI.SW & XLVI.NW*

1:2500 Series, 1957, *NY13*

Aerial Data

Table 7: Prints held at the Cumbria Historic Environment Record

Library Ref.	Sortie	Date
NY1337/A	TG CCC 06E, 5	2006-05-05
NY1337/B	TG CCC 06E, 9	2006-05-05
NY1338/G	TG CCC 06F, 5	2006-05-05
NY1338/N	TG CCC 06F, 12	2006-05-05
NY1338/O	TG CCC 06F, 13	2006-05-05
NY1338/P	TG CCC 06F, 14	2006-05-05
NY1437/6.8.9	221	2006-05-05
NY1437/A	STJ ACE 63	2006-05-05
NY1437/AA	TG CCC 06E, 4	2006-05-05
NY1437/B	MU CS 83, 3	2006-05-05
NY1437/C	MU CS 83, 4	2006-05-05
NY1437/D	MU CS 108, 11	1976-01-01
NY1437/E	MU CS 108, 12	1976-01-01
NY1437/F	MU CS 108, 13	1976-01-01
NY1437/G	MU CS 108, 14	1976-01-01
NY1437/H	MU CS 108, 15	1976-01-01
NY1437/I	MU CS 108, 16	1976-01-01
NY1437/J	CCC 2169, 6	1981-02-01
NY1437/K	CCC 2169, 7	1981-02-01
NY1437/L	CCC 2169, 8	1981-02-01
NY1437/M	CCC 2169, 9	1981-02-01
NY1437/O	RB 72, 33	1982-02-11
NY1437/P	RB 72, 34	1982-02-11
NY1437/Q	RB 72, 35	1982-02-11
NY1437/R	RB 72, 36	1982-02-11
NY1437/S	RB 72, 37	1982-02-11
NY1437/T	RB 72, 38	1982-02-11

Library Ref.	Sortie	Date
NY1437/U	RB 76, 1	1982-04-28
NY1437/V	RB 76, 2	1982-04-28
NY1437/W	RB 76, 3	1982-04-28
NY1437/X	TG CCC 06E, 1	2006-05-05
NY1437/Y	TG CCC 06E, 2	2006-05-05
NY1437/Z	TG CCC 06E, 3	2006-05-05
NY1438/6.10.4	159	2006-05-05
NY1438/A	TG CCC 06F, 1	2006-05-05
NY1438/B	TG CCC 06F, 2	2006-05-05
NY1438/C	TG CCC 06F, 3	2006-05-05
NY1438/D	TG CCC 06F, 15	2006-05-05
NY1439/A	MU CS 108, 20	1976-01-01
NY1439/B	MU CS 108, 21	1976-01-01
NY1439/C	MU CS 108, 22	1976-01-01
NY1537/6.8.10	223	Unknown
NY1538/6.10.5	161	Unknown

Google Satellite Imagery (2011), centred at 54º43’44.70’’

Environmental Agency Open Lidar Data, plates NY1437, NY1438, NY1537 & NY1538, available online at <http://environment.data.gov.uk/ds/survey/index.jsp#/survey>

APPENDIX 1: CULTURAL HERITAGE ASSETS WITHIN THE INNER STUDY AREA

Asset no.	Description	NGR	HER Reference
HA1	A large circular enclosure measuring approximately 65m in diameter, visible as a cropmark on aerial photographs and as a low ditch on LiDAR data. There is an entrance visible on its western side, and its northern side is truncated by a field boundary.	314799 537749	3722
HA2	Quarry and kiln works, marked on historic maps and plans, dating to at least the mid-19th century. The extent of the known quarry and lime works are mapped on the Cumberland HER, and is based on historic mapping	314489 538217	10861
HA3	Ridge and furrow evidenced as cropmarks on aerial imagery.	314959 537855	N/A

HCQC19

HIGH CLOSE QUARRY, ASPATRIA,CUMBRIA

GEOPHYSICAL SURVEY REPORT

PLANNING REF. 2/19/9010 & 2/19/9011

commissioned by Stephenson Halliday
on behalf of Thomas Armstrong (Aggregates) Ltd

January 2020

HEADLAND ARCHAEOLOGY

REGISTERED CIfA ORGANISATION

HIGH CLOSE QUARRY, ASPATRIA,CUMBRIA

GEOPHYSICAL SURVEY REPORT

PLANNING REF. 2/19/9010 & 2/19/9011

commissioned by Stephenson Halliday
on behalf of Thomas Armstrong (Aggregates) Ltd

January 2020

PROJECT INFO:
HA Project Code **HCQC19** / NGR **NY 1472 3811** / Parish **Plumbland** / Local Authority **Cumbria County Council** / OASIS Ref. **headland5-380017**

PROJECT TEAM:
Project Manager **Sam Harrison** / Author **David Harrison** / Fieldwork **Glyn Sheldrick, Richard McGregor Edwards** / Graphics **Beata Wieczorek-Oleksy, Sam Harrison**

Approved by **Sam Harrison** [redacted]...............

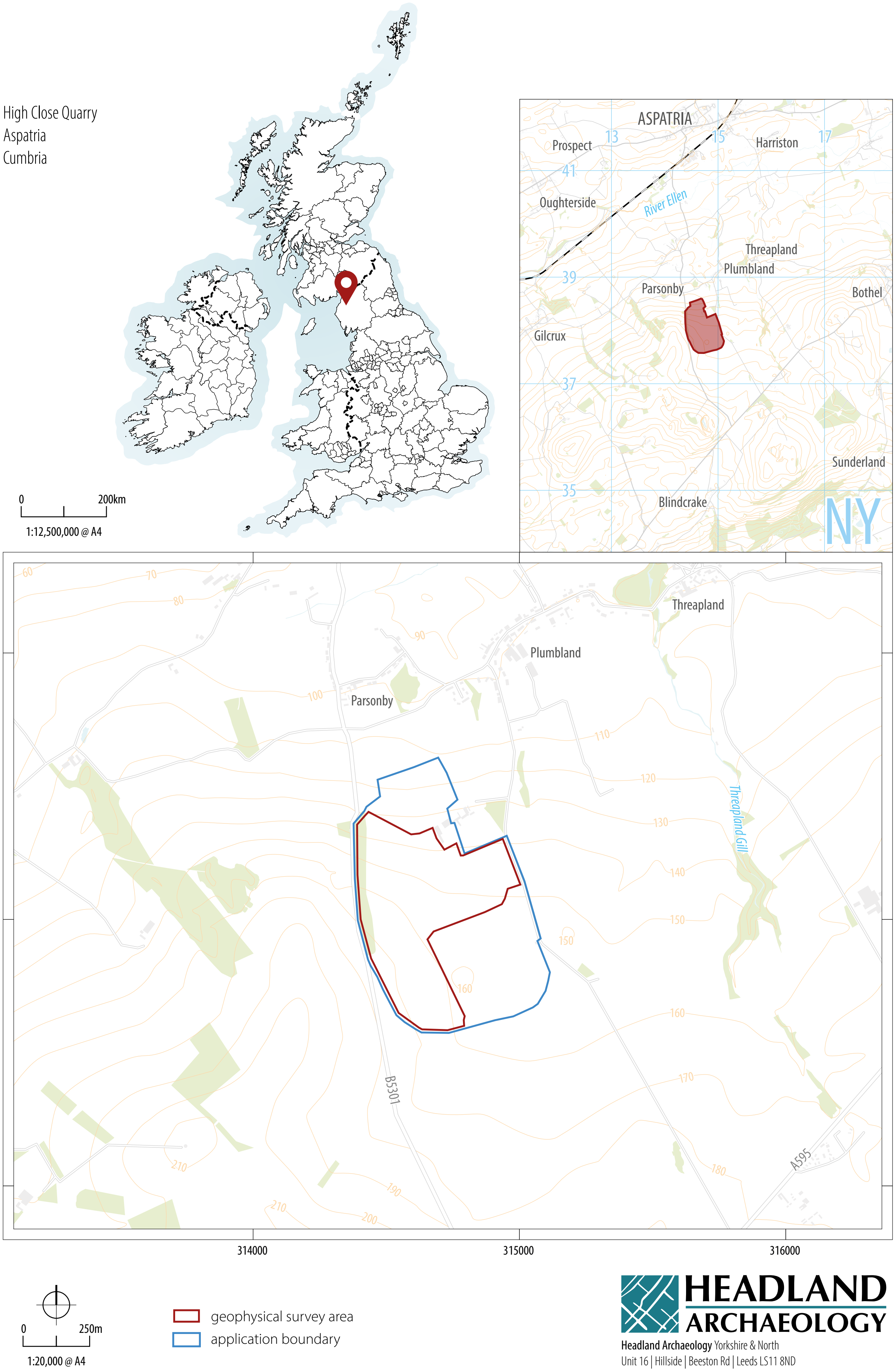
Headland Archaeology Yorkshire & North
Unit 16 | Hillside | Beeston Rd | Leeds LS11 8ND
t 0113 387 6430
e yorkshireandnorth@headlandarchaeology.com
w www.headlandarchaeology.com

PROJECT SUMMARY

Headland Archaeology (UK) Ltd undertook a geophysical (magnetometer) survey covering 25 hectares on land at High Close Farm, near Aspatria, Cumbria, to inform planning for the reopening of a dormant limestone quarry (Planning Application Ref 2/19/9010 & 2/19/9011). The survey has identified a clear area of archaeological potential in the south of the application area comprising a sub-oval enclosure. The enclosure is located close to a cropmark of prehistoric or Romano-British origin which is recorded on the Cumbria Historic Environment Record (CHER Ref 3722) and is assessed as of high archaeological potential. Isolated high magnitude anomalies in the vicinity of the enclosure may be due to pits and are assessed as of moderate archaeological potential, whilst two particularly broad and high magnitude anomalies may indicate burning, although a modern origin cannot be discounted. An extensive area of magnetic disturbance in the north of the site clearly locates the extents of the former, infilled limestone quarry which is also recorded on the HER (Ref 10861). Elsewhere, anomalies have been identified which reflect the post medieval agricultural landscape in the form of ploughing and field drains. Therefore, on the basis of the geophysical survey, the majority of the application area is assessed as of low archaeological potential and locally high in the vicinity of the enclosure.

CONTENTS

LIST OF ILLUSTRATIONS



HEADLAND ARCHAEOLOGY
Headland Archaeology Yorkshire & North
Unit 16 | Hillside | Beeston Rd | Leeds LS11 8ND
t 0113 387 6430
e yorkshireandnorth@headlandarchaeology.com
w www.headlandarchaeology.com

ILLUS 1 Site location

HIGH CLOSE QUARRY, ASPATRIA,CUMBRIA

GEOPHYSICAL SURVEY REPORT

1 INTRODUCTION

Headland Archaeology (UK) Ltd was commissioned by Stephenson Halliday (the Agent), on behalf of Thomas Armstrong (Aggregates) Ltd (the Client) to undertake a geophysical survey on land at High Close Farm, near Aspatria, Cumbria, to inform planning for the reopening of a dormant limestone quarry (Planning Application Ref 2/19/9010 & 2/19/9011). The results of the survey will inform future archaeological strategy at the site.

The survey was undertaken in order to assess the impact of the proposed development on the historic environment and was undertaken in accordance with an Archaeological Written Scheme of Investigation (WSI) (Harrison 2019) which was submitted to, and approved by, Jeremy Parsons, Historic Environment Officer at Cumbria County Council, with guidance within the National Planning Policy Framework (MHCLG 2019) and in line with current best practice (Chartered Institute for Archaeologists 2014, Europae Archaeologia Consilium 2016).

1.1 SITE LOCATION, TOPOGRAPHY AND LAND-USE

The Application Area (AA) extends north and south of High Close Farm, 500m south-west of Plumbland, centred on NY 1471 3811 (Illus 1). It comprises an irregularly-shaped block of land over 42 hectares and is bound to the west by the B5301 (Parsonby Brow) and to the east by a minor road between Plumbland and the A595. The Geophysical Survey Area (GSA) covers only those fields (F1–F6) where extraction is proposed. Survey was restricted along the west of F1/F4 by a strip of trees and within F2 by overgrown vegetation (Illus 2).

Generally, the topography falls from the south and west being at 177m Above Ordnance Datum (AOD) in the south of F6 and at 130m AOD at High Close Farm. At the time of the survey the GSA was mostly under improved pasture.

The survey was carried out between the 10th and 13th December 2019.

1.2 GEOLOGY AND SOILS

The bedrock geology mostly comprises Fifth Limestone and includes a narrow band of sandstone running north/south through the east of the AA and a north/south band of Fourth Shale Member (sandstone, siltstone and mudstone) along the western site boundary (NERC 2019). Glacial till is recorded over the east of the AA with no superficial deposits recorded over F1, F2 or F4.

The soils are classified in the Soilscape 17 Association, characterised as slowly permeable, seasonally wet loams and clays (Cranfield University 2019).

2 ARCHAEOLOGICAL BACKGROUND

An Archaeological Desk-Based Assessment (Fox 2017) identified three heritage assets within the AA comprising a cropmark enclosure of prehistoric or Romano-British date (CHER 3722), a quarry and lime kilns dating from the early nineteenth century or earlier (CHER 10861), and areas of ridge and furrow cultivation (Illus 5).

ILLUS 2 F2, looking north

3 AIMS, METHODOLOGY AND PRESENTATION

The general aim of the geophysical survey was to provide enough information to establish the presence/absence, character and extent of any archaeological remains within the GSA. This will therefore enable an assessment to be made of the impact of the proposed development on any sub-surface archaeological remains, if present.

The specific archaeological objectives of the geophysical survey were:

- to provide information about the nature and possible interpretation of any magnetic anomalies identified;
- to therefore determine the likely presence/absence and extent of any buried archaeological features; and
- to produce a comprehensive site archive and report.

3.1 MAGNETOMETER SURVEY

Magnetic survey methods rely on the ability of a variety of instruments to measure very small magnetic fields associated with buried archaeological remains. A feature such as a ditch, pit or kiln can act like a small magnet, or series of magnets, that produce distortions (anomalies) in the earth's magnetic field. In mapping these slight variations, detailed plans of sites can be obtained as buried features often produce reasonably characteristic anomaly shapes and strengths (Gaffney & Gater 2003). Further information on soil magnetism and the interpretation of magnetic anomalies is provided in Appendix 1.

The survey was undertaken using four Bartington Grad601 sensors mounted at 1m intervals (1m traverse interval) onto a rigid carrying frame. The system was programmed to take readings at a frequency of 10Hz (allowing for a 10–15cm sample interval) on roaming traverses (swaths) 4m apart. These readings were stored on an external weatherproof laptop and later downloaded for processing and interpretation. The system was linked to a Trimble R8s Real Time Kinetic (RTK) differential Global Positioning System (dGPS) outputting in NMEA mode to ensure a high positional accuracy for each data point.

MLGrad601 and MultiGrad601 (Geomar Software Inc) software was used to collect and export the data. Terrasurveyor V3.0.35.1 (DWConsulting) software was used to process and present the data.

3.2 REPORTING

A general site location plan is shown in Illus 1 at a scale of 1:20,000. Illus 2–4 are site condition photographs. Illus 5 is a 1:4,000 survey location plan showing the direction of survey as GPS swaths. The data is presented in greyscale and XY trace formats, at a scale of 1:2,500, in Illus 6 and Illus 7. Illus 8 is an interpretation plot of the data also at a scale of 1:2,500.

Technical information on the equipment used, data processing and magnetic survey methodology is given in Appendix 1. Appendix 2 details the survey location information and Appendix 3 describes the composition and location of the site archive. Data processing details are presented in Appendix 4. A copy of the OASIS entry (Online Access to the Index of Archaeological Investigations) is reproduced in Appendix 5.

ILLUS 3 F3, looking west

The survey methodology, report and any recommendations comply with the Written Scheme of Investigation (Harrison 2019), guidelines outlined by Europae Archaeologia Consilium (EAC 2016) and by the Chartered Institute for Archaeologists (CIfA 2014). All illustrations from Ordnance Survey (OS) mapping are reproduced with the permission of the controller of Her Majesty's Stationery Office (© Crown copyright).

The illustrations in this report have been produced following analysis of the data in 'raw' and processed formats and over a range of different display levels. All illustrations are presented to most suitably display and interpret the data from this site based on the experience and knowledge of management and reporting staff.

4 RESULTS AND DISCUSSION

Ground conditions were good throughout the GSA and have contributed to a high standard of data throughout. A variable magnetic background has been detected across the survey area which is due to the magnetic susceptibility of the soils and the limestone bedrock from which they derive. Against this background several anomalies have been identified and cross-referenced to specific examples on the interpretation figure (Illus 8).

4.1 FERROUS ANOMALIES

Ferrous anomalies, characterised as individual 'spikes', are typically caused by ferrous (magnetic) material, either on the ground surface or in the plough-soil. Little importance is normally given to such anomalies, unless there is any supporting evidence for an archaeological interpretation, as modern ferrous debris is common on most sites, often being present as a result of manuring or tipping/infilling. There is no obvious clustering to these ferrous anomalies which might indicate an archaeological origin. Far more probable is that the 'spike' responses are likely caused by the random distribution of ferrous debris in the upper soil horizons.

Localised areas of magnetic disturbance in the south of F4 are caused by animal feeders/troughs.

Two high magnitude dipolar linear anomalies, SP1 and SP2, aligned north-west/south-east in the east of F3 locate buried service pipes. The larger dipolar linear anomaly, SP3, aligned north-east/south-west across the centre of the site locates a gas main.

Magnetic disturbance along the field edges is due to the presence of ferrous material within and adjacent to the field boundaries and is of no archaeological interest.

4.2 QUARRYING ANOMALIES

Magnetic disturbance dominates the survey data throughout F2. This is caused by the material used to infill the former limestone quarry.

4.3 AGRICULTURAL ANOMALIES

Series of faint parallel linear trends are identified throughout the GSA on various alignments. These are mostly aligned parallel with the existing field boundaries and are caused by post medieval and/or modern ploughing. Series of parallel trends throughout F3 are aligned oblique to the field boundaries and are indicative of modern land drainage.

A fragmented linear anomaly (FB1, Illus 8) can be seen north/south in F1 and F4 over 600m. The anomaly is aligned roughly parallel

ILLUS 4 F6, looking east

with Parsonby Brow which borders the AA to the west, and is thought to be due to a former field boundary pre-dating the first edition Ordnance Survey map (1866). The anomaly is caused by the soil-fill of a ditch.

4.4 GEOLOGICAL ANOMALIES

As previously mentioned, a variable magnetic background has been detected throughout the GSA. This manifests in the data as both frequent discrete areas of magnetic enhancement and as series of long, low magnitude sinuous trends. The latter are mostly aligned north/south in the western half of the GSA and follow the same alignment as the narrow bands of sandstone, siltstone and mudstone which are recorded by the British Geological Survey (NERC 2019).

4.5 ARCHAEOLOGICAL AND POSSIBLE ARCHAEOLOGICAL ANOMALIES

A clear sub-oval enclosure, E1, has been identified in the east of F6 close to a cropmark of prehistoric or Romano-British origin which is recorded on the CHER (Ref 3722). The enclosure (centred on NY 1471 3772) measures 110m north/south and 43m east/west and is assessed as of high archaeological potential. Several discrete anomalies are identified in the interior of the enclosure which may be archaeological in origin. However, against the variable magnetic background it is difficult to confidently discriminate between discrete anomalies which may be due to archaeological activity, such as pits, and those that are probably due to localised geological variation. For this reason, most of the anomalies within E1 are ascribed a possible archaeological origin and those outside, except where the responses are particularly broad or high in magnitude (eg P1–P3), interpreted as of non-archaeological origin.

West of E1, isolated anomalies of particularly high magnitude (BU1 and BU2) may be caused by burning activity, perhaps kilns. However, no coherent pattern is discernible from the data and the anomalies could be caused by modern industrial activity. These anomalies are assessed as of moderate archaeological potential.

In the centre of F4 a clear rectilinear anomaly (D1) does not conform to the prevailing pattern of agricultural anomalies and therefore an archaeological cause should be considered. The anomaly is due to a soil-filled ditch and may be archaeological in origin.

5 CONCLUSION

The survey has successfully evaluated the geophysical survey area and has identified a clear area of archaeological potential in the south of the site comprising a sub-oval enclosure. The enclosure is located close to a cropmark of prehistoric or Romano-British origin which is recorded on the Cumbria Historic Environment Record (CHER Ref 3722) and is assessed as of high archaeological potential. Isolated high magnitude anomalies in the vicinity of the enclosure may be due to pits and are assessed as of moderate archaeological potential, whilst two particularly broad and high magnitude anomalies may indicate burning, although a modern origin cannot be discounted. An extensive area of magnetic disturbance in the north of the site clearly locates the extents of the former, infilled limestone quarry which is also recorded on the HER (Ref 10861). Elsewhere, anomalies have been identified which reflect the post medieval agricultural landscape in the form of ploughing and field drains. Therefore, on the basis of the geophysical survey, the majority of the application area is assessed as of low archaeological potential and locally high in the vicinity of the enclosure.

6 REFERENCES

Chartered Institute for Archaeologists (CIfA) 2014 ***Standard and guidance for archaeological geophysical survey*** (Reading) http://www.archaeologists.net/sites/default/files/CIfAS%26GGeophysics_2.pdf accessed 18 December 2019

Cranfield University 2019 ***Cranfield Soil and Agrifood Institute Soilscapes*** http:// www.landis.org.uk/soilscapes/ accessed 18 December 2019

Europae Archaeologia Consillium (EAC) 2016 ***EAC Guidelines for the Use of Geophysics in Archaeology: Question to Ask and Points to Consider*** (Namur, Belgium) http://www.old.european-archaeological-council.org/files/eac_guidelines_2_final.pdf accessed 18 December 2019

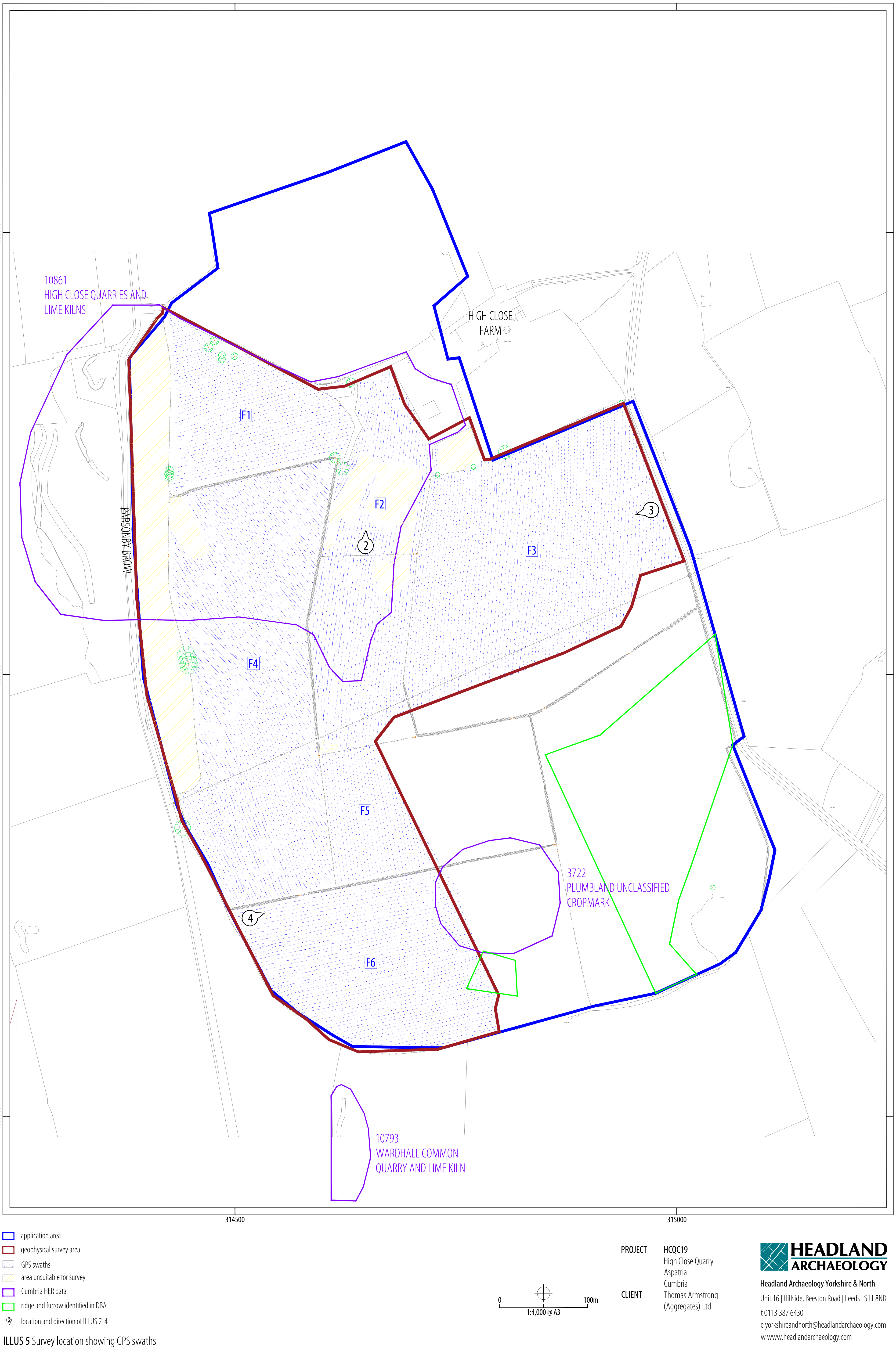
Fox S 2017 ***High Close Quarry, Aspatria, Cumbria; Archaeological Desk-Based Assessment*** [unpublished client report] Headland Archaeology Ref HCQA17

Gaffney C & Gater J 2003 ***Revealing the Buried Past: Geophysics for Archaeologists*** Stroud

Ministry of Housing, Communities and Local Government MHCLG) 2019 ***National Planning Policy Framework*** https://assers.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/81017/NPPF_Feb_2019_revised.pdf accessed 18 December 2019

Harrison D 2019 ***High Close Quarry, Aspatria, Cumbria; Written Scheme of Investigation for Geophysical Survey*** [unpublished client report] Headland Archaeology Ref HCQC19

Natural Environment Research Council (NERC) 2019 ***British Geological Survey*** http://www.bgs.ac.uk/ accessed 18 December 2019



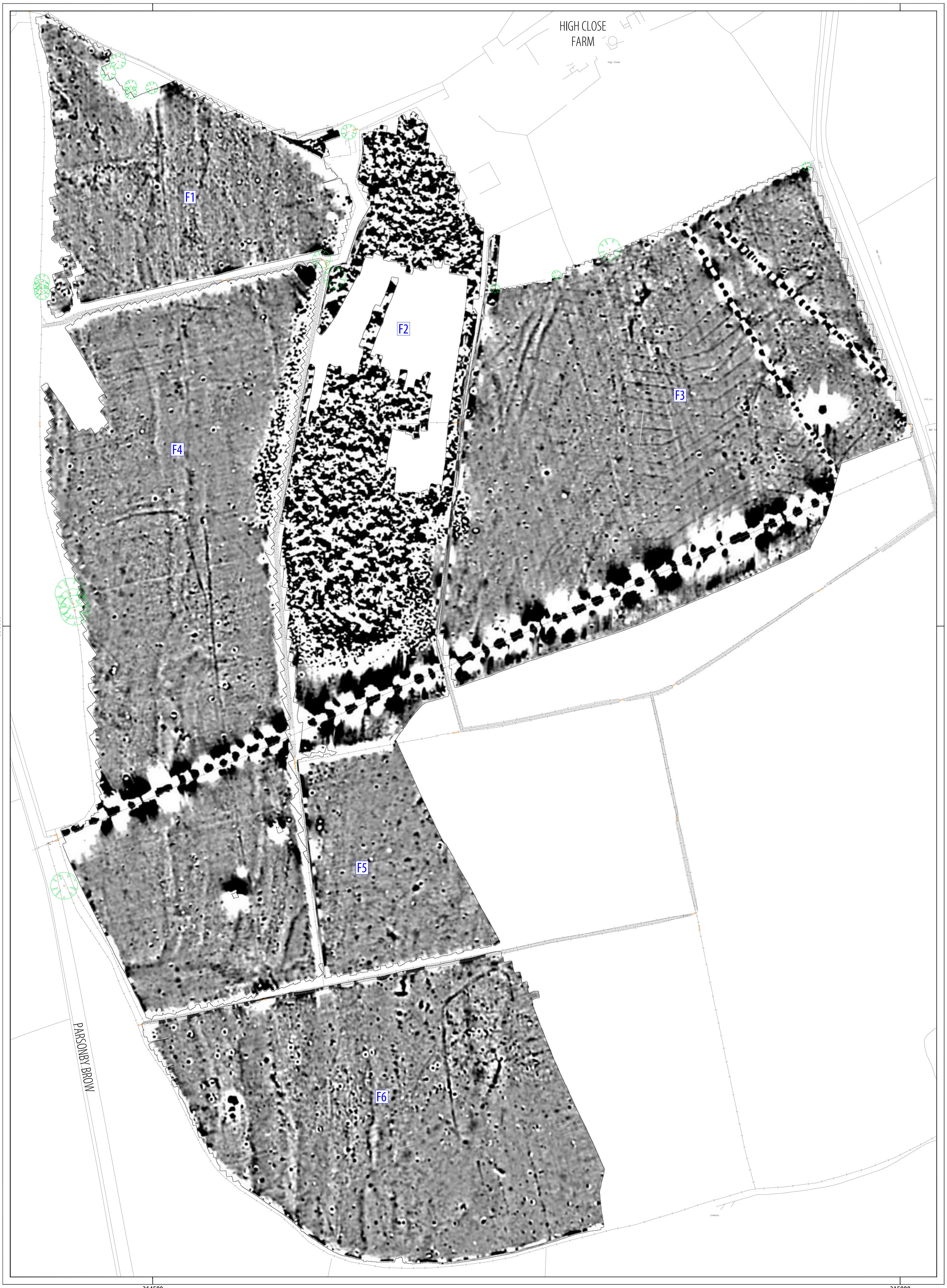
ILLUS 5 Survey location showing GPS swaths

PROJECT HCQC19
High Close Quarry
Aspatria
Cumbria

CLIENT Thomas Armstrong
(Aggregates) Ltd

HEADLAND ARCHAEOLOGY

Headland Archaeology Yorkshire & North
Unit 16 | Hillside, Beeston Road | Leeds LS11 8ND
t 0113 387 6430
e yorkshireandnorth@headlandarchaeology.com
w www.headlandarchaeology.com



nT
-2.0 3.0

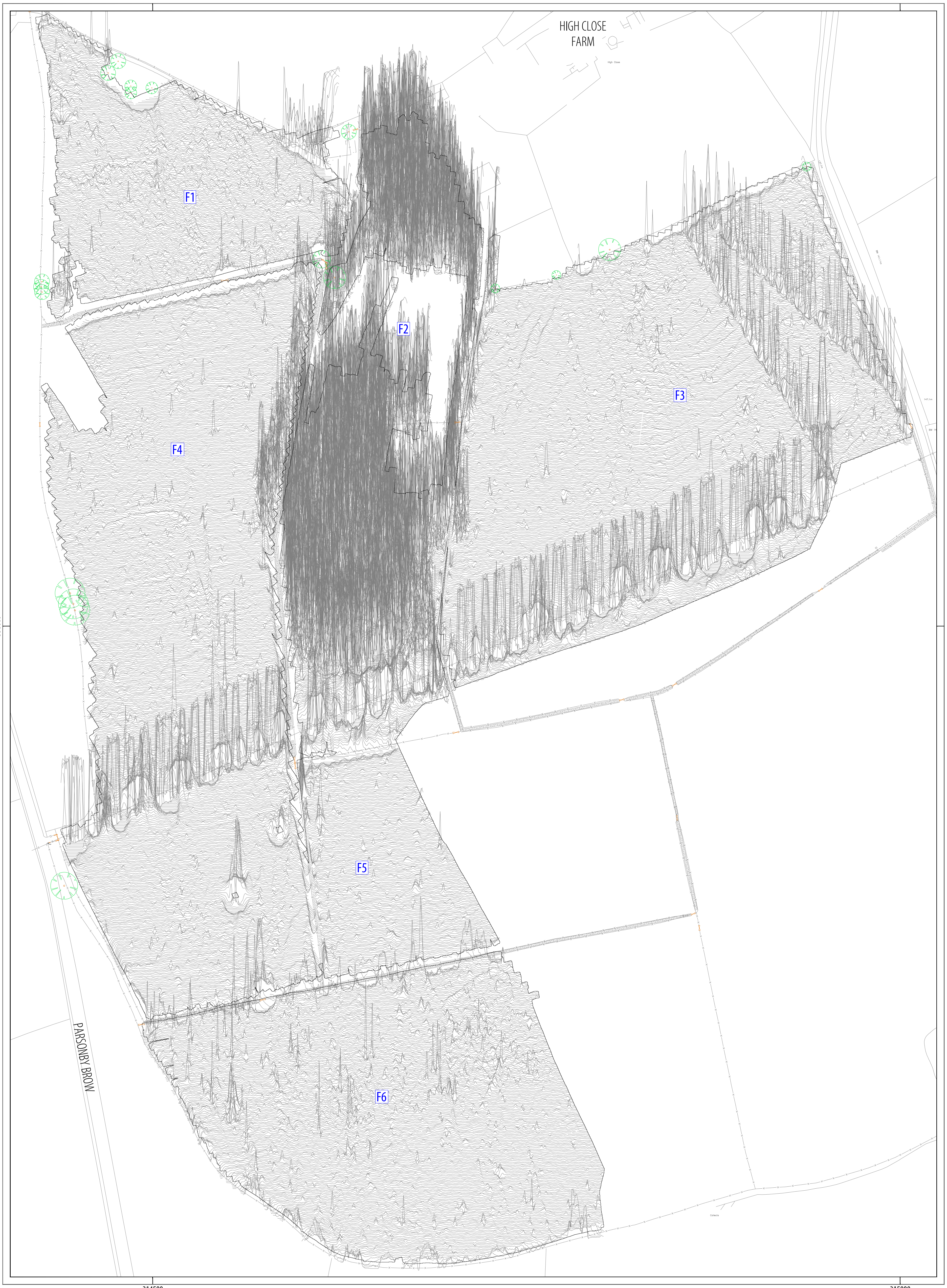
0 50m
1:2,500 @ A3

PROJECT HCQC19
High Close Quarry
Aspatria
Cumbria

CLIENT Thomas Armstrong (Aggregates) Ltd

HEADLAND ARCHAEOLOGY
Headland Archaeology Yorkshire & North
Unit 16 | Hillside, Beeston Road | Leeds LS11 8ND
t 0113 387 6430
e yorkshireandnorth@headlandarchaeology.com
w www.headlandarchaeology.com

ILLUS 6 Processed greyscale magnetometer data

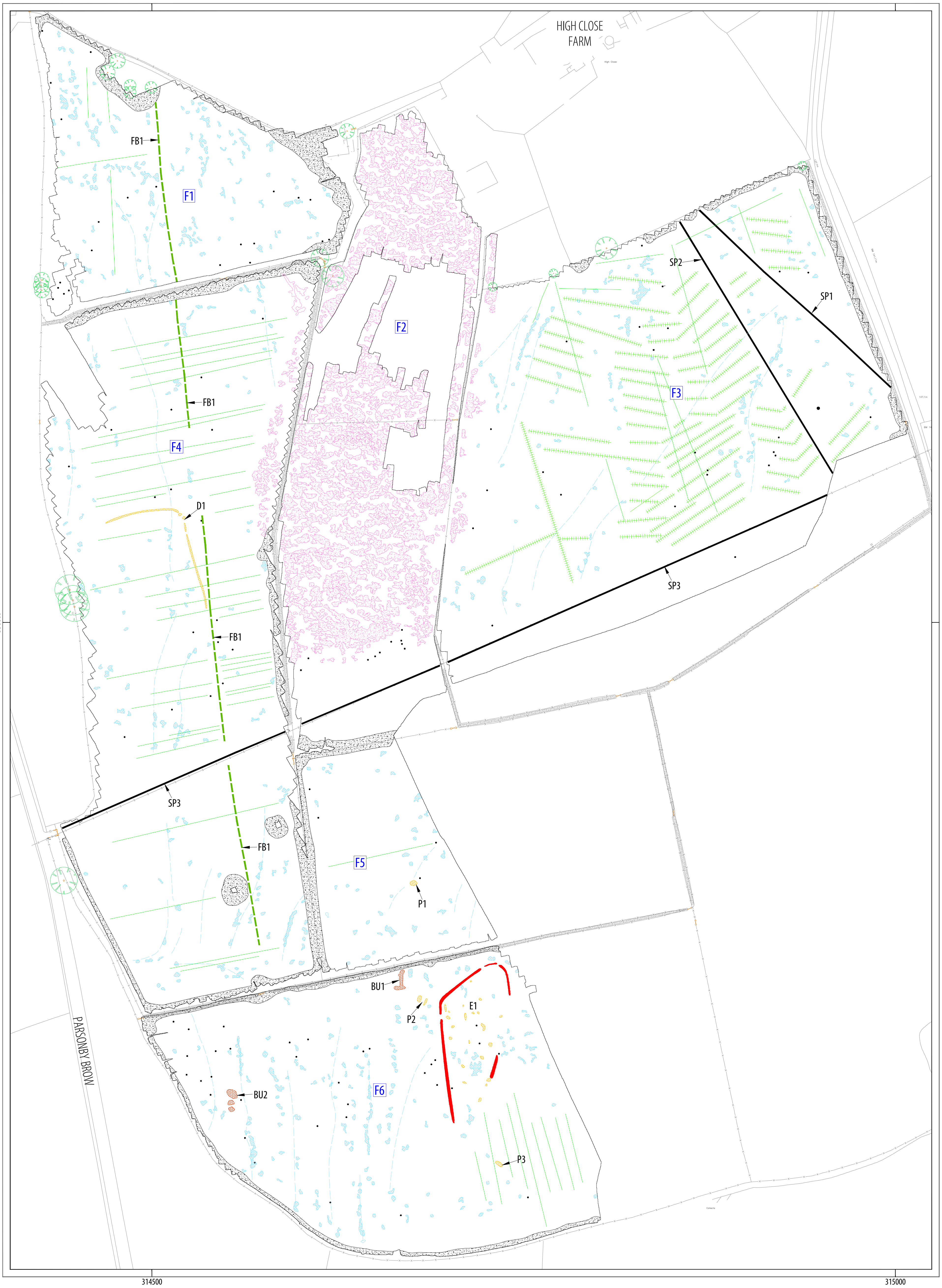


PROJECT HCQC19
High Close Quarry
Aspatria
Cumbria

CLIENT Thomas Armstrong
(Aggregates) Ltd

HEADLAND ARCHAEOLOGY
Headland Archaeology Yorkshire & North
Unit 16 | Hillside, Beeston Road | Leeds LS11 8ND
t 0113 387 6430
e yorkshireandnorth@headlandarchaeology.com
w www.headlandarchaeology.com

ILLUS 7 XY trace plot of minimally processed magnetometer data



TYPE OF ANOMALY	INTERPRETATION
dipolar isolated	ferrous material
magnetic disturbance	ferrous material
dipolar linear	service pipe
magnetic disturbance	quarrying
linear trend	agricultural
linear trend	field drain

TYPE OF ANOMALY	INTERPRETATION
linear	former field boundary?
linear trend	geological variation
magnetic enhancement	geology
magnetic enhancement	archaeology?
magnetic enhancement	kiln/burning
magnetic enhancement	archaeology

ABBREVIATIONS

BU	burning?
D	ditch
E	enclosure
FB	former boundary
P	pit
SP	service pipe

0 50m
1:2,500 @ A3

PROJECT HCQC19
High Close Quarry
Aspatria
Cumbria

CLIENT Thomas Armstrong
(Aggregates) Ltd

HEADLAND ARCHAEOLOGY
Headland Archaeology Yorkshire & North
Unit 16 | Hillside, Beeston Road | Leeds LS11 8ND
t 0113 387 6430
e yorkshireandnorth@headlandarchaeology.com
w www.headlandarchaeology.com

ILLUS 8 Interpretation of magnetometer data

7 APPENDICES

APPENDIX 1 MAGNETOMETER SURVEY

Magnetic susceptibility and soil magnetism

Iron makes up about 6% of the earth's crust and is mostly present in soils and rocks as minerals such as maghaemite and haematite. These minerals have a weak, measurable magnetic property termed magnetic susceptibility. Human activities can redistribute these minerals and change (enhance) others into more magnetic forms so that by measuring the magnetic susceptibility of the topsoil, areas where human occupation or settlement has occurred can be identified by virtue of the attendant increase (enhancement) in magnetic susceptibility. If the enhanced material subsequently comes to fill features, such as ditches or pits, localised isolated and linear magnetic anomalies can result whose presence can be detected by a magnetometer (fluxgate gradiometer).

In general, it is the contrast between the magnetic susceptibility of deposits filling cut features, such as ditches or pits, and the magnetic susceptibility of topsoils, subsoils and rocks into which these features have been cut, which causes the most recognisable responses. This is primarily because there is a tendency for magnetic ferrous compounds to become concentrated in the topsoil, thereby making it more magnetic than the subsoil or the bedrock. Linear features cut into the subsoil or geology, such as ditches, that have been silted up or have been backfilled with topsoil will therefore usually produce a positive magnetic response relative to the background soil levels. Discrete feature, such as pits, can also be detected.

The magnetic susceptibility of a soil can also be enhanced by the application of heat. This effect can lead to the detection of features such as hearths, kilns or areas of burning.

Types of magnetic anomaly

In the majority of instances anomalies are termed 'positive'. This means that they have a positive magnetic value relative to the magnetic background on any given site. However, some features can manifest themselves as 'negative' anomalies that, conversely, means that the response is negative relative to the mean magnetic background.

Where it is not possible to give a probable cause of an observed anomaly a '?' is appended.

It should be noted that anomalies interpreted as modern in origin might be caused by features that are present in the topsoil or upper layers of the subsoil. Removal of soil to an archaeological or natural layer can therefore remove the feature causing the anomaly.

The types of response mentioned above can be divided into five main categories that are used in the graphical interpretation of the magnetic data:

Isolated dipolar anomalies (iron spikes) These responses are typically caused by ferrous material either on the surface or in the topsoil. They cause a rapid variation in the magnetic response giving a characteristic 'spiky' trace. Although ferrous archaeological artefacts could produce this type of response, unless there is supporting evidence for an archaeological interpretation, little emphasis is normally given to such anomalies, as modern ferrous objects are common on rural sites, often being present as a consequence of manuring.

Areas of magnetic disturbance These responses can have several causes often being associated with burnt material, such as slag waste or brick rubble or other strongly magnetised/fired material. Ferrous structures such as pylons, mesh or barbed wire fencing and buried pipes can also cause the same disturbed response. A modern origin is usually assumed unless there is other supporting information.

Lightning-induced remnant magnetisation (LIRM) LIRM anomalies are thought to be caused in the near surface soil horizons by the flow of an electrical currents associated with lightning strikes. These observed anomalies have a strong bipolar signal which decreases with distance from the spike point and often appear as linear or radial in shape.

Linear trend This is usually a weak or broad linear anomaly of unknown cause or date. These anomalies are often caused by agricultural activity, either ploughing or land drains being a common cause.

Areas of magnetic enhancement/positive isolated anomalies Areas of enhanced response are characterised by a general increase in the magnetic background over a localised area whilst discrete anomalies are manifest by an increased response (sometimes only visible on an XY trace plot) on two or three successive traverses. In neither instance is there the intense dipolar response characteristic exhibited by an area of magnetic disturbance or of an 'iron spike' anomaly (see above). These anomalies can be caused by infilled discrete archaeological features such as pits or post-holes or by kilns. They can also be caused by pedological variations or by natural infilled features on certain geologies. Ferrous material in the subsoil can also give a similar response. It can often therefore be very difficult to establish an anthropogenic origin without intrusive investigation or other supporting information.

Linear and curvilinear anomalies Such anomalies have a variety of origins. They may be caused by agricultural practice (recent ploughing trends, earlier ridge and furrow regimes or land drains), natural geomorphological features such as palaeochannels or by infilled archaeological ditches.

APPENDIX 2 SURVEY LOCATION INFORMATION

An initial survey base station was established using a Trimble VRS differential Global Positioning System (dGPS). The magnetometer data was georeferenced using a Trimble RTK differential Global Positioning System (Trimble R8s model).

Temporary sight markers were laid out using a Trimble VRS differential Global Positioning System (Trimble R8s model) to guide the operator and ensure full coverage. The accuracy of this dGPS equipment is better than 0.01m.

The survey data were then super-imposed onto a base map provided by the client to produce the displayed block locations. However, it should be noted that Ordnance Survey positional accuracy for digital map data has an error of 0.5m for urban and floodplain areas, 1.0m for rural areas and 2.5m for mountain and moorland areas. This potential error must be considered if coordinates are measured off hard copies of the mapping rather than using the digital coordinates.

Headland Archaeology cannot accept responsibility for errors of fact or opinion resulting from data supplied by a third party.

APPENDIX 3 GEOPHYSICAL SURVEY ARCHIVE

The geophysical archive comprises an archive disk containing the raw data in XYZ format, a raster image of each greyscale plot with associate world file, and a PDF of the report.

The project will be archived in-house in accordance with recent good practice guidelines (http://guides.archaeologydataservice.ac.uk/g2gp/Geophysics_3). The data will be stored in an indexed archive and migrated to new formats when necessary.

APPENDIX 4 DATA PROCESSING

The gradiometer data has been presented in this report in processed greyscale and minimally processed XY trace plot format.

Data collected using RTK GPS-based methods cannot be produced without minimal processing of the data. The minimally processed data has been interpolated to project the data onto a regular grid and de-striped to correct for slight variations in instrument calibration drift and any other artificial data.

A high pass filter has been applied to the greyscale plots to remove low frequency anomalies (relating to survey tracks and modern agricultural features) in order to maximise the clarity and interpretability of the archaeological anomalies.

The data has also been clipped to remove extreme values and to improve data contrast.

APPENDIX 5 OASIS DATA COLLECTION FORM: ENGLAND

OASIS ID: headland5-380017

PROJECT DETAILS	
Project name	High Close Quarry, Aspatria
Short description of the project	Headland Archaeology (UK) Ltd undertook a geophysical (magnetometer) survey covering 25 hectares on land at High Close Farm, near Aspatria, Cumbria, to inform planning for the reopening of a dormant limestone quarry (Planning Application Ref 2/19/9010 and 2/19/9011). The survey has identified a clear area of archaeological potential in the south of the application area comprising a sub-oval enclosure. The enclosure is located close to a cropmark of prehistoric or Romano-British origin which is recorded on the Cumbria Historic Environment Record (CHER Ref 3722) and is assessed as of high archaeological potential. Isolated high magnitude anomalies in the vicinity of the enclosure may be due to pits and are assessed as of moderate archaeological potential, whilst two particularly broad and high magnitude anomalies may indicate burning, although a modern origin cannot be discounted. An extensive area of magnetic disturbance in the north of the site clearly locates the extents of the former, infilled limestone quarry which is also recorded on the HER (Ref 10861). Elsewhere, anomalies have been identified which reflect the post medieval agricultural landscape in the form of ploughing and field drains. Therefore, on the basis of the geophysical survey, the majority of the application area is assessed as of low archaeological potential and locally high in the vicinity of the enclosure.
Project dates	Start: 10-12-2019 End: 13-12-2019
Previous/future work	Not known / Not known
Any associated project reference codes	HCQC19 - Sitecode
Type of project	Field evaluation
Site status	None
Current Land use	Grassland Heathland 5 - Character undetermined
Monument type	None
Monument type	None
Significant Finds	None
Significant Finds	None
Methods & techniques	''Geophysical Survey''
Development type	Mineral extraction (eg sand, gravel, stone, coal, ore, etc)
Prompt	National Planning Policy Framework - NPPF
Position in the planning process	Pre-application
Solid geology (other)	Fifth Limestone and includes a narrow band of sandstone running north/south through the east of the AA and a north/south band of Fourth Shale Member (sandstone, siltstone and mudstone) along the western site boundary
Drift geology	Glacial sand and gravel
Techniques	Magnetometry

PROJECT LOCATION	
Country	England
Site location	Cumbria allerdale plumbland High Close Quarry, Aspatria, Cumbria
Study area	25 Hectares
Site coordinates	NY 1472 3811 54.730621377481 -3.324465526267 54 43 50 N 003 19 28 W Polygon

PROJECT CREATORS	
Name of Organisation	Headland Archaeology
Project brief originator	Headland Archaeology

Project design originator	Headland Archaeology
Project director/manager	Harrison, S
Project supervisor	McGregor Edwards, R.
Type of sponsor/funding body	Developer

PROJECT ARCHIVES	
Physical Archive Exists?	No
Digital Archive recipient	In house
Digital Contents	'other'
Digital Media available	'Geophysics','Images raster / digital photography','Images vector'
Paper Archive Exists?	No

PROJECT BIBLIOGRAPHY 1	
Publication type	Grey literature (unpublished document/manuscript)
Title	High Close Quarry, Aspatria, Cumbria
Author(s)/Editor(s)	Harrison, D.
Other bibliographic details	HCQC19
Date	2020
Issuer or publisher	Headland Archaeology
Place of issue or publication	Edinburgh
Description	A4 Glue bound report and PDF/A

Entered by	Sam Harrison (sam.harrison@headlandarchaeology.com)
Entered on	9 January 2020

Headland Archaeology Scotland
13 Jane Street
Edinburgh EH6 5HE
t 0131 467 7705
e scotland@headlandarchaeology.com

Headland Archaeology Yorkshire & North
Unit 16 | Hillside | Beeston Rd
Leeds LS11 8ND
t 0113 387 6430
e yorkshireandnorth@headlandarchaeology.com

Headland Archaeology South & East
Building 68C | Wrest Park | Silsoe
Bedfordshire MK45 4HS
t 01525 861 578
e southandeast@headlandarchaeology.com

Headland Archaeology Midlands & West
Unit 1 | Clearview Court | Twyford Rd
Hereford HR2 6JR
t 01432 364 901
e midlandsandwest@headlandarchaeology.com

Headland Archaeology North West
Fourways House | 57 Hilton Street
Manchester M1 2EJ
t 0161 236 2757
e northwest@headlandarchaeology.com

www.headlandarchaeology.com

APPENDIX 8: TRANSPORT

Transport Assessment

High Close Quarry

Dormant Quarry Application

Plumbland, Cumbria

Creative Minds, *Intelligent Thinking*

CONTENTS

DOCUMENT QUALITY CONTROL	DOCUMENT REF: 665-TS		
	Revision	14	Digitally signed
	Originated	SW	
	Reviewed	RAH	
	Authorised	AW	
	18 January 2021		

CONTACT *Dr Amer Halabi PhD MBA FCIHT FAPM MIoD FFB BEng(Hons)*

☎0845 47 48 851 itransportplanning@outlook.com www.iprtgroup.com

i. iPRT© Transport Planning has been commissioned by the Applicant to provide a Transport Assessment (TA) for the proposed application for the determination of conditions under the Environment Act 1995 to which the dormant minerals planning permission ref CA49 is to be subject [with an expiry date of 22nd Feb 2042]. The proposal will also include an area for plant, stockpiling and storage which all relate to the quarrying of limestone. It also includes a planning application for new site access.

ii. The Application site lies on the land to the east of the B5301 Parsonby Brow, google maps links http://bit.ly/2QVy9kF and http://bit.ly/2XADTTk

iii. A site meeting was held on the 29th November with Cumbria County Council Highways where the access location, visibility splays and mitigation proposals were agreed. It was further agreed that **all HGV movements related to High Close Quarry would be travelling south along the B5301 towards the A595 (unless any temporary road closures) and similarly, existing Thomas Armstrong HGVs carrying limestone aggregates travelling through Parsonby will cease doing so**. The reason being that these are existing vehicle movements from other quarries which supply mineral to Thomas Armstrong Ltd, which High Close would replace.

iv. The development proposals are in line with the relevant national, regional and local transport policies.

v. There are no known committed development or highway network proposals that may have an impact on the findings of this TA.

vi. Whilst all personal injury incidents (PIIs) are regrettable, the overall level of accidents observed does not give undue cause for concern nor does there appear to be any discernible patterns to accidents at any of the junctions or carriageways in the immediate vicinity of the proposed development.

vii. Detailed junction capacity assessment regarding the B5301 and A595 junction and the analysis undertaken has demonstrated that:

   a. The highway network is adequate to support the vehicle movements for the proposed development, so would not be detrimental to highway safety of road users;

   b. With no HGVs travelling on the B5301 through Parsonby (ref: iii above) the proposals will result in substantial highway network and community benefits;

   c. No mitigation measures are required; and

   d. The development does not result in an unacceptable impact on highway safety or a residual cumulative impact on the road network that is severe and thus should not be refused on transport grounds, as set out in paragraph 109 of the Revised NPPF.

viii. It is concluded that the proposed development meets all safety and Planning Policy requirements and will have no material impact onto the highway network and as such, there are no transport / highways reasons for refusal of planning permission.

Chapter 1
- Introduction
- Development Proposals
- Site Location

Chapter 2
- Scoping Study (if undertaken)
- Guidance & Methodology

Chapter 3
- Existing Highway Conditions
- Non-Motorised Accessibility
- Committed Developments & Highway Network Changes
- Personal Injury Incidents (if undertaken)

Chapter 4
- Development Proposals
- Movement & Accessibility Strategy
- Access Arrangements & Visibility Splays
- Parking Provision & Servicing Arrangements
- Trip Generation & Multi-Modal analysis

Chapter 5
- Multi-Modal Development Impact
- Preliminary Mitigation Proposals (if applicable)
- Travel Plan / Welcome Pack recommendations
- Residual Impact

Chapter 6
- Summary & Conclusions

1.1 iPRT© Transport Planning has been commissioned by the Applicant to provide a TA for the proposed application for the determination of conditions under the Environment Act 1995 to which the dormant minerals planning permission ref CA49 is to be subject [with an expiry date of 22nd Feb 2042]. The proposal will also include an area for plant, stockpiling and storage which all relate to the quarrying of limestone. It also includes a planning application for new site access. Please refer to the Planning Statement for Concept plan.

1.2 Site meetings were held with Cumbria County Council Highways (the latest being 29th Nov 2019) where the access location, visibility splays and mitigation proposals were agreed as demonstrated in Figure 1.1 below and Appendix 2.

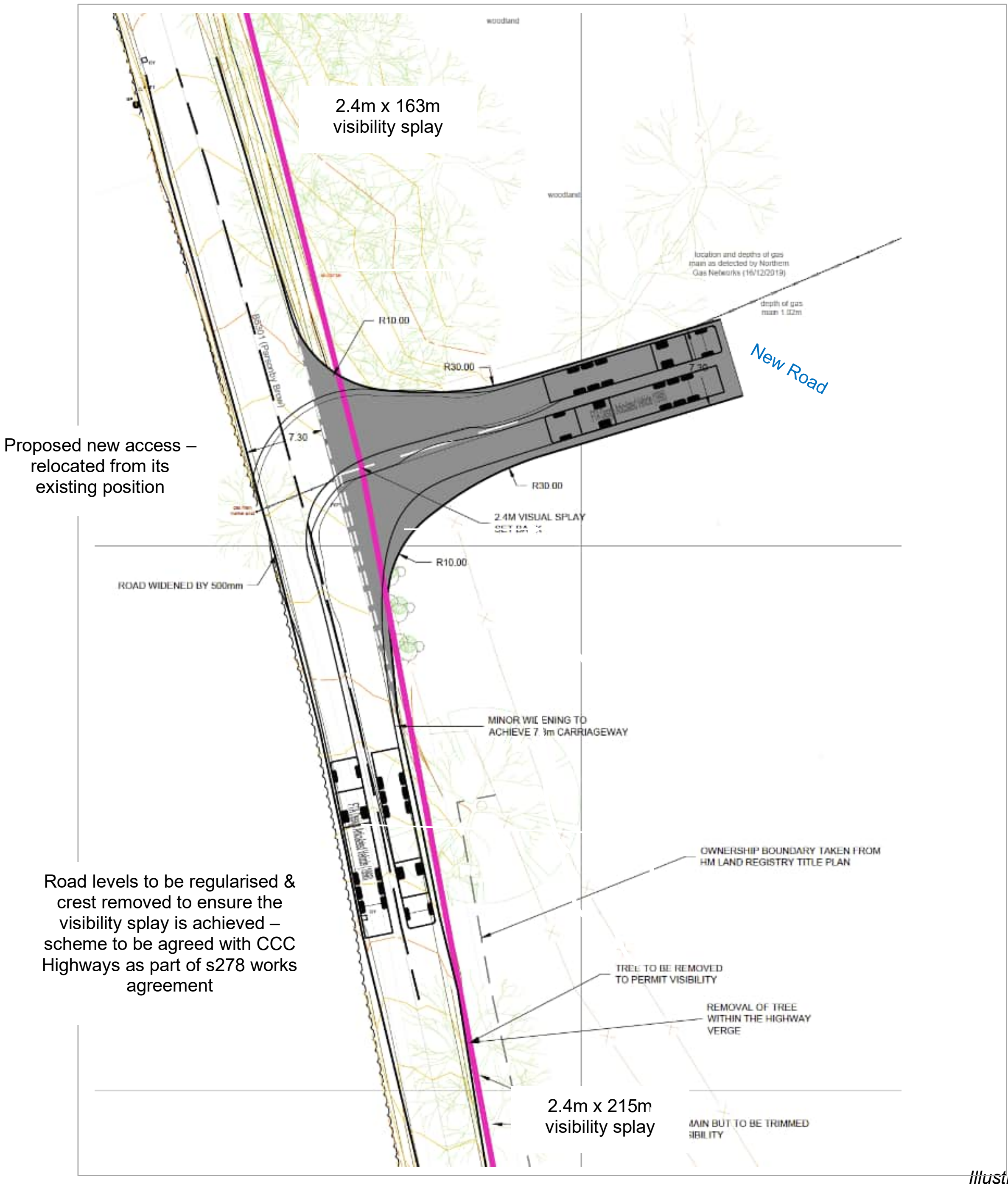


Figure 1.1
Illustrative proposals

1.3 The Application site lies on the land to the east of the B5301 Parsonby Brow, google maps links http://bit.ly/2QVy9kF and http://bit.ly/2XADTTk

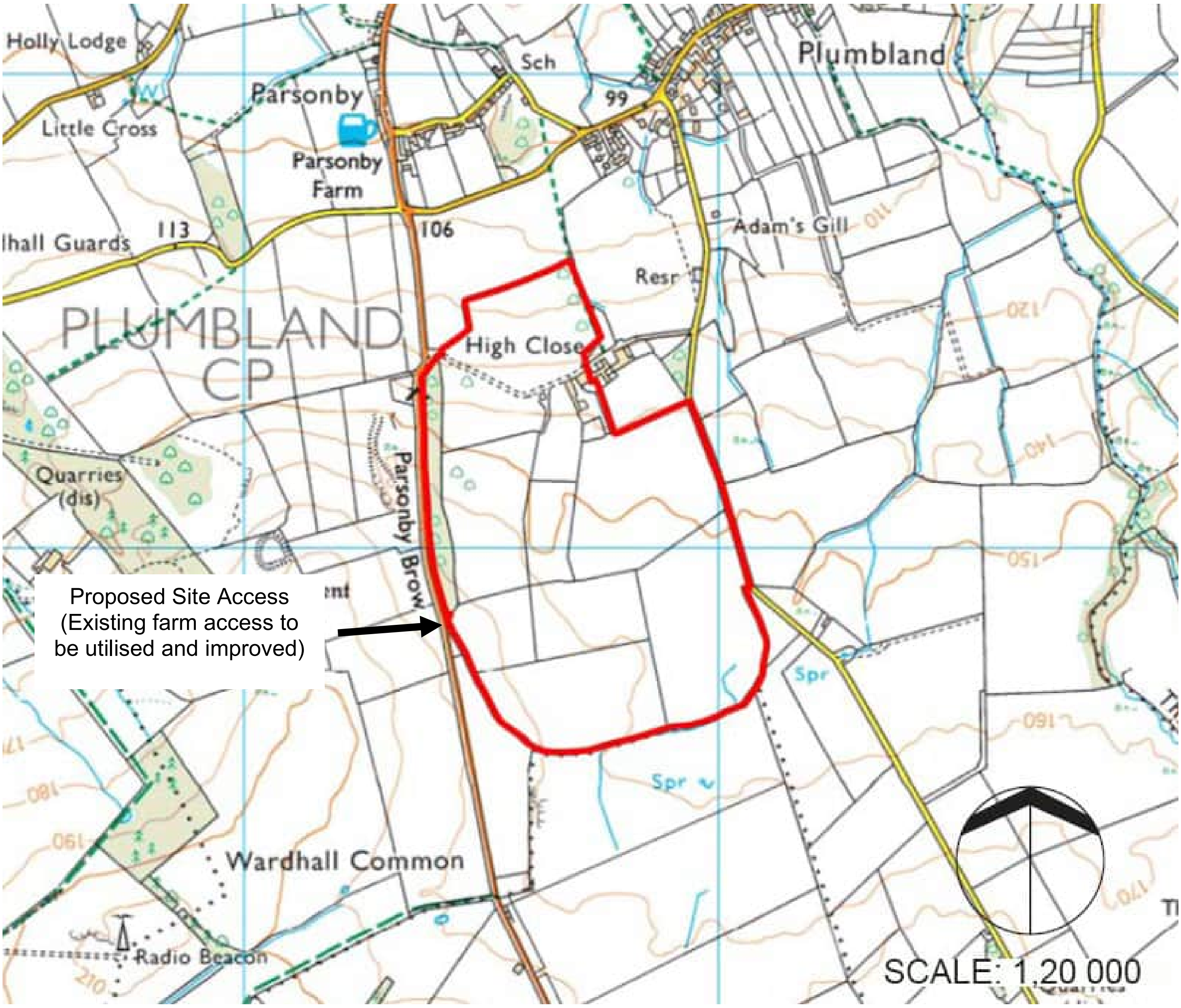


Figure 1.2
Illustrative Location

2.0 Scoping Discussions & Methodology

2.1 On 18th March and 29th Nov 2019, site meetings were held with Cumbria County Council Highways where the development proposals, access, visibility splay and mitigation proposals where considered.

2.2 In summary:

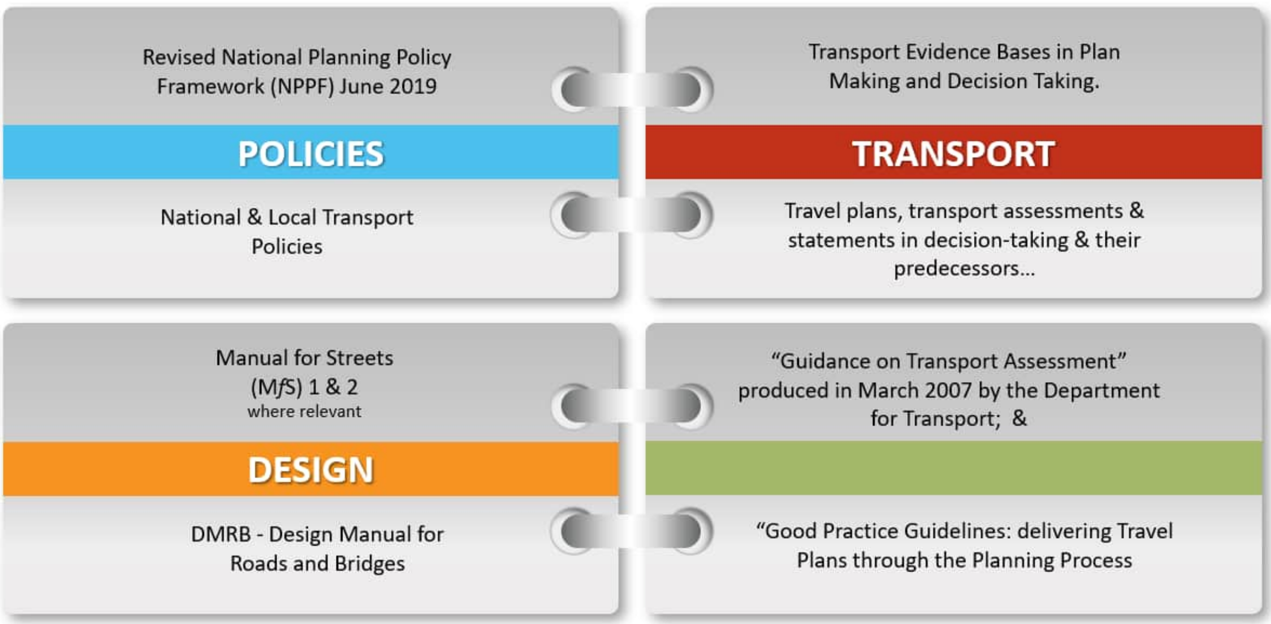
- The proposed site access location is acceptable (subject to junction design – Appendix 2);
- Repeat the speed survey to confirm the suitability of the proposed visibility splay'
- A section of the B5301 Parsonby Brow would need to be levelled to ensure safe visibility is achieved; and
- Any land that the visibility splay intercepts will need to be included within the red line boundary or a covenant agreed to allow unobstructed visibility.

2.3 The following is included as part of the TA:

- A high-level review of the existing highway conditions;
- Development proposals, site connectivity and sustainability;
- Site access proposals;
- A595/B5301 Junction Capacity;
- The Speed Survey results;
- Impact on the highway network; and
- Consideration of any committed developments and associated highway network changes in the immediate vicinity of the site that may have an impact on the findings of this Report.

References & Guidelines

2.4 Where relevant, the TA will be in line with Cumbria CC LTP3, Minerals Planning Policy – please refer to submitted Environmental Statement and Policy Statement and



EXISTING HIGHWAYS CONDITIONS

Note: *All dimensions, descriptions and speeds are approximate and may not apply to the entire length of the carriageway. All images are for illustration purposes only*

3.1 The site is located in open countryside some 800 – 1000m to the south of the villages of Parsonby and Plumbland (Figure 1.2).

B5301

Figure 3.1
B5301 – Key features

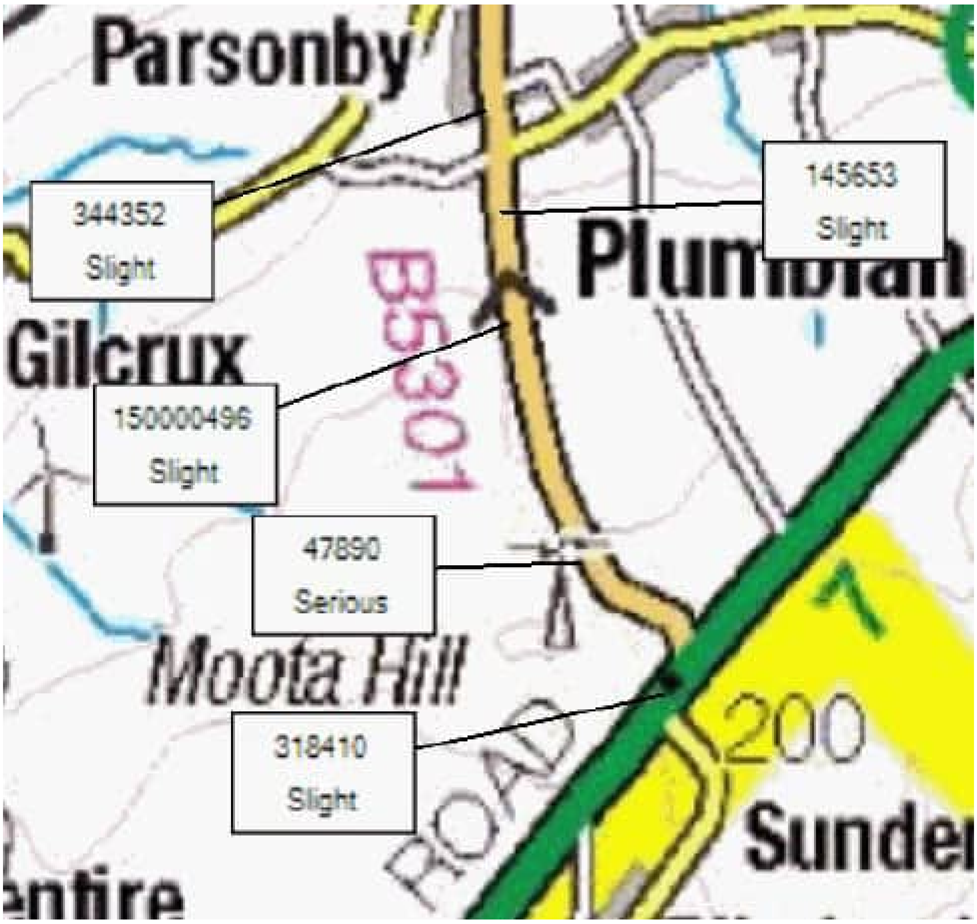
Accessibility By Sustainable Modes of Travel

3.2 By their nature, quarries are located in remote locations and accessibility by public transport is rare. However, bus service 600 is 2.75km from the application site [along the A595 in the vicinity of Moota Garden Centre] which may provide opportunities for car sharing. The service services the route between Carlisle, Wigton, Cockermouth and Whitehaven at a general frequency of 2hrs in each direction.

3.3 However, the site is within 5km cycling distance from local villages including Bothel, Threapland, Parsonby, Plumbland, Blindcrake and Gilcrux to name a few hence, there are realistic opportunities for those locally employed to travel to work by cycle.

Personal Injury Incidents [PII]

3.4 The most recent 5 years incidents history was obtained from Cumbria County Council which indicated that there have been 5 incidents between the A595 and Parsonby one of which was serious:



3.5 The incidents were analysed and the findings are as follows:

- *Incident Ref 318410* Slight, 8th August 2018, frost, fine, daylight conditions. V001 and V002 have been travelling Northbound along A595 - V001 has attempted to overtake V002 - V001 has then realised that there is on-coming traffic and pulled back into the nearside lane - colliding with V002.

  That stretch of the A595 is straight with clear forward visibility. The causation factor (based on Ref: 1 in Volume 3 of this submission) would be Careless / thoughtless / reckless behaviour, poor turn or manoeuvre, loss of control and failure to look.

- *Incident Ref 47890* Serious, 14th Jan 2016, dry, fine, daylight conditions. V1 travelling in a westerly direction on the B5301 from the A595 to Aspatria when it skidded at a corner and crashed into a field.

  The causation factors identified would be excessive speed for the conditions and slippery road.

- *Incident Ref 00496* Slight, 26th Feb 2015, raining, wet/damp daylight conditions. V1 hit standing water and park on the side of the road, on a bend and not in clear sight of other vehicles and was struck by V2 which also hit the same standing water.

  The causation factors identified were slippery road, road layout, vegetation and possibly travelling too fast. Based on the Eastings and Northings, this location (to the immediate north of the proposed site access) will be cleared of all vegetation and will be improved as part of the site access proposals and the stretch of the B5301 identified by CCC Highways (Figure 1.1) which will be regularised and the crest levelled off improving road drainage hence, improving forward and intervisibility between drivers and results in a betterment to the entire local community and road users generally.

  The incident is regrettable and this location has not encountered a repeat of such occurrence.

- *Incident Ref 145653* Slight, 11th January 2017, snowing with high winds, wet/damp dark conditions with mud surface. Vehicle 1 travelling down the hill has lost control on a sharp corner, struck the verge causing a skid and collided with a tree causing the vehicle to come to a rest on its side.

  The causations factors identified were slippery road and loss of control.

- *Incident Ref 344352* Slight, 3rd Nov 2018, raining, wet/damp daylight conditions. V001 has been travelling downhill on S bends - has slipped on the wet road causing the vehicle to roll and crash.

  The causations factors identified were slippery road, road layout and or loss of control.

3.6 Further to the above, it is understood that a community member has emailed Cumbria County Council Highways Network manager stating that two HGV incidents took place on 26th Nov and 15th Dec 2019; it was stated that the first incident was due to the HGV brake system catching fire and the second due to a milk tanker coming off the road. Neither of these two incidents was reported on the official County Council database which is not unusual as typically the database is 4 or so weeks behind hence, the causation factors are yet to be determined. However, taking into consideration that a**ll HGV movements related to High Close Quarry will be travelling south along the B5301 towards the A595 and similarly, existing Thomas**

Armstrong HGVs carrying limestone aggregates travelling through Parsonby will cease doing so, the causation factors of the incidents offered by the community member are irrelevant to this application.

3.7 In conclusion, all PIIs are regrettable. Having analysed the data, and taken into account the built environment in which they occurred, it can be reasonably concluded that collisions are not attributable to any particular design or other common occurrences. The prevailing cause for the incidents appears to be road user error and there is no apparent collisions issue in the area that would affect, or be affected by, the Proposal.

3.8 Having said that, as part of the proposed site access and road surface improvements (discussed under incident ref: 00496), the development proposals will bring forward betterment to the local community and road users generally.

COMMITTED DEVELOPMENTS & HIGHWAY NETWORK CHANGES

3.9 The TA junction capacity assessment has considered the existing operational Moota Quarry vehicular movements.

3.10 It is understood that Moota Quarry employs 14 members of staff, 275 full operational days per annum between 06.00 to 19.00 Mondays to Fridays and 06.00 to 12.30 on Saturdays. The average in terms of vehicle movements per day are:

<u>Quarry Operations</u>

- 3No arrivals per hour & 3No leaving per hour.
- **Total 6 vehicles per hour**

<u>Asphalt Operations</u>

- 1 – 2 No arrivals per hour and 1 – 2 No leaving per hour.
- **Total 4 vehicles per hour**

Total up to 10 vehicles / two-way trips per hour.

3.11 In addition, Clints Quarry is a dormant quarry, owned by D A Harrison, located immediately south of the A595 near the B5301 junction which has the potential to reopen in the future and a Scoping Opinion has been issued by the Lake District National Park Authority. The Scoping information provided has indicated that, if permitted, Clints Quarry could employ 8 - 10 staff working on site and produce some 150,000 to 200,000 tonnes per annum.

3.12 Based on 275 full working days per year and 19 to 29 tonne payloads, would equate to 29 - 38 deliveries per full working day (approx. 2 - 3 per hour), amounting to 58 - 76 two-way HGV movements onto the A595. However, it is understood that a large proportion of the vehicles would be replacements of existing D A Harrison Ltd and their subsidiary company Atlas Concrete, limestone aggregated deliveries.

PROJECT DESCRIPTION

4.1 The Applicant undertook geological appraisal in 2011 and 2016/2017 to identify the area with the best potential to quarry limestone. There were two principal options to develop the quarry, from the south or the north and it was concluded that the better option would be to work in a north to south direction.

4.2 Concept Working Scheme is included in the Planning submission. The concept working plans also show the potential area which is envisaged for the processing plant, storage and stockpiling plus a readymix concrete plant.

4.3 On a corporate level, the Applicant seeks adequate supply of limestone aggregate due to the unavailability of limestone in the quantities required daily to support their operations and to guarantee the long term supply to the Applicant's group companies. The material will be used for the production of concrete blocks at Silloth and Penrith and will replace bought in material from Brampton, Carnforth, Bowes, Tendley and Bothel hence, it will help to reduce the Group's carbon footprint. It will also be used in the production of precast concrete products at the Workington plant and also by the Applicant's Construction company in the Building and Civil Engineering departments. In addition, the material will be used the production and supply of pre-packed products in trade packs and bulk bags to local builders' merchants. Finally, it is intended to supply current and future external customers.

Phasing

4.4 Restoration material from workings will be removed and stored in bunds within the site.

4.5 The proposed final restoration would utilise the non-yield minerals, overburden and soil making material to create an appropriate landscape profile.

Dormant Quarry Application

4.6 In Transport terms, the key issues which would affect the dormant quarry application are:

ITEM	DORMANT VS PROPOSED
Production rate	Would be as proposed for the of the dormant ROMP application
Delivery vehicle routing from the Quarry	All HGVs to exit and enter the site from the A595
Quarry access	Will continue to be directly off the B5301 however, relocated to the preferred location on Parsonby Brow agreed in liaison with Cumbria CC Highways.

Figure 4.1
Key Transport issues – existing vs proposed

Site Access

4.7 The main quarry access would remain off the B5301 however, discussions with Mr Andrew Harrison of Cumbria CC Highways (Appendix 3) concluded that the original access at the north end of the site (which was historically used for the former quarry and landfill site) would no longer be acceptable and following site meetings a new access point on Parsonby Brow has been confirmed as being acceptable.

4.8 The new access point is within the CA 49 planning permission boundary and in tandem with the dormant quarry application, a separate application for the access has been submitted.

4.9 The new access point to the B5301 is located at the top of Parsonby Brow and a preliminary junction design is attached in Appendix 2. The access road width enables two HGVs to pass each other on a bend.

Visibility Splay

4.10 3No. 7 days ATC speed survey was undertaken between 22nd – 28th January 2018, 8-14 Feb and 13-19 March 2020 in the vicinity of the proposed site access, where the road is generally level, straight and good intervisibility between drivers.

4.11 Speed survey analysis of all 3 surveys was undertaken and concluded that the 85th percentile was 58mph northbound and 56.9mph southbound hence, the required vis splays are 163m to the right and 215m will be provided to the left.:

Northbound	58	
Wet Road Speed	55.5	24.81721
Enter t	2	
Enter deceleration	0.25	
g	9.81	
a	0	
v2		615.8939
d		2.4525
2(d+0.1a)		4.905

Vis Splay	**175.2**
SSD	**177.7**

Southbound	56.9	
Wet Road Speed	54.4	24.32546
Enter t	2	
Enter deceleration	0.25	
g	9.81	
a	2	
v2		591.7282
d		2.4525
2(d+0.1a)		5.305

Vis Splay	**160.2**
SSD	**162.7**

Figure 4.2
Speed survey calculations to determine the visibility splays

4.12 Extrapolation of visibility splays based on actual measured speed surveys, particularly at higher speeds i.e. 50mph and above is supported by a number of Appeal decisions where the Inspector's decision concluded:

> **18. Whilst I note the HA's view in relation to the extrapolation of the SSDs between the figures set out in Table 3 of TD 9/93 I was not taken to any part of DMRB, or any other evidence, which indicates that this cannot be done and I see no reason why a common sense approach should not be taken. SSDs are calculated on the basis of speed of the vehicle, driver perception-reaction times and braking distance, which takes account of the rate of deceleration. These are longer at higher speeds. Thus, it stands to reason that drivers travelling above 85kph (almost 53mph) but less than 100kph (62mph) would be able to stop in distances between 160 metres and 215 metres (figures identified in Table 3, TD 9/93 as correlating to those speeds). The majority of vehicles surveyed were travelling at speeds below 62mph. Consequently, in practice and having regard to the measured 85th percentile speed on the road, there would be sufficient forward visibility available to enable the majority of eastbound vehicles to stop in time should it be necessary.**

WORKING HOURS

- No operations or development permitted shall take place within the proposed fixed processing plant area except between the following hours:-

  0700 - 1800 Monday to Friday
  0700 - 1300 Saturday

- No mineral extraction or associated removal or replacement of soil or overburden shall take place except between the following hours:-

  0700 - 1800 Monday to Friday
  0700 - 1300 Saturday

- Essential maintenance work only shall be permitted between the additional hours of 1300 - 1700 on Saturdays and 0800 - 1700 on Sundays.

STAFF NUMBERS

4.13 It is anticipated that the quarry would employ 10 members of staff who would travel by 8 vehicles to site split equally between Carlisle and Cockermouth.

HIGH CLOSE QUARRY TRIP GENERATION

4.14 The predicted minimum annual tonnage would be 150,000 tonnes per annum. The average annual tonnage would be 205,000 tonnes and the maximum annual tonnage would be 250,000 tonnes. To be robust, the forthcoming analysis is based on the maximum annual tonnage of 250,000 tonnes and 275 full working days per annum:

- 80% of vehicle movements 30-tonne payload;
- 20% of vehicle movements 20-tonne payload;
- 184 HGV loads per week (368 HGV movements / 2 ways);
- 3.5 - 4 vehicles per hour (7 - 8 HGV movements / 2 way trips);
- Approx. 37 HGV loads (74 HGV movements / 2 way trips) on full working days.

4.15 In reality, 33% of the above being replacements of existing Thomas Armstrong HGV aggregates vehicle movements, the below would the additional/new HGV movements as a result of the Proposal:

- 123 HGV loads per week (246 HGV movements / 2 ways). The difference is 61 vehicle movements less 1-way / 122 vehicle movements less 2-way;
- 2 - 3 vehicles per hour (4 - 6 HGV movements / 2-way trips). The difference is 1 - 1.5 vehicle movements less per hour 1 way / 2 - 3 vehicle movements less per hour 2 way;
- Approx. 24.5 - 25 HGV loads (49 - 50 HGV movements / 2-way trips) on full working days. The difference is 12 - 12.5 HGV loads less 1 way / 24 - 25 HGV loads less 2 way on full working days

4.16 Anticipated Direction of travel for Thomas Armstrong Ltd from High Close is 56% towards Cockermouth and 44% towards Carlisle.

EXTENT OF IMPACT

5.1 Since all HGV vehicular movements will be heading south from the quarry on the B5301, CCC Highways has requested that the junction of B5301 with the A595 be assessed for its operational capacity.

5.2 Turning counts were undertaken on 10th November 2019 and the raw data is attached in Appendix 4.

TEMPro

5.3 The A595 is a major distributor road linking Carlisle with Cockermouth hence, TEMPro was interrogated as to the growth factors between 2019 and 2029 using the following methodology:

- Software version 7.2
- Dataset version 7.2
- Trip ends by time period
- Area definition Highest factor of Cumbria, Allerdale, Barrow in Furness, Carlisle, Copeland, Eden and South Lakeland was used
- Transport Mode All Purpose
- Time period AM and PM Peaks
- Trip end type Origin / Destination
- Data type Growth factor
- Year of opening 2019
- Design Year 2029

5.4 The resultant data from para 5.3 above was then adjusted by NTM database:

AM Peak

Level	Area	Local Growth Figure
County	Cumbria	1.0901
Authority	Allerdale	1.0850
Authority	Barrow-in-Furness	1.0914
Authority	Carlisle	1.0981
Authority	Copeland	1.0941
Authority	Eden	1.0832
Authority	South Lakeland	1.0868

Figure 5.1a
TEMPro growth rates (AM Peak)

PM Peak

Level	Area	Local Growth Figure
County	Cumbria	1.0843
Authority	Allerdale	1.0788
Authority	Barrow-in-Furness	1.0828
Authority	Carlisle	1.0931
Authority	Copeland	1.0877
Authority	Eden	1.0796
Authority	South Lakeland	1.0815

Figure 5.1b
TEMPro growth rates (PM Peak)

5.5 To be robust and for simplicity, the base flows were adjusted by 10% upwards to account for future growth.

JUNCTION OPERATIONAL CAPACITY ASSESSMENT

5.6 In evaluating the performance of a junction, it is accepted that the Ratio of Flow to Capacity [RFC] or Degree of Saturation [DoS] are indicators of the likely performance of a junction and is calculated by means of an empirical formula contained within a computer programme and should be interpreted as follows:

- RFC 0.85 / DoS 90% or below: Junction operating within capacity and with significant spare capacity.
- RFC 0.85 to 0.99 / DoS 90% to 99%: Junction operating within but approaching its theoretical capacity and statistically the likelihood of queues forming is increased; and
- RFC 1.0 / DoS 100% or above: Demand for the junction exceeds its theoretical capacity and therefore queuing is likely.

5.7 Based on the above, iTransport Planning employ a traffic light system to gauge the following measures:

- RFC (Ratio of Flow to Capacity) worst-case approach value at the junction;
- Queue - number of vehicles on the worst-case approach to the junction; and
- Delay – typical number of seconds per vehicle on the worst-case approach to the junction.

JUNCTION OPERATIONS *[Typical Values]*			
RFC	<0.85	0.85 – 0.99	>10
Queue (Veh)	<10	10 - 40	>40
Delay (S)	<30	30 - 90	>90

Figure 5.2
'Traffic Light' Thresholds

5.8 The B5301 / A595 junction has been assessed using Junctions 9 (Picady) modelling software under the following scenarios:

- **Do Nothing**: This is the scenario with the base, base + committed traffic flows to 2029;
- **Do Development**: The 'Do Development' scenario includes the Development traffic in addition to the Do Nothing scenario.

5.9 Full junction modelling outputs are included in Appendix 6.

TRIPS DISTRIBUTION

Moota Quarry

5.10 As discussed in para 3.10, Moota Quarry is expected to generate 10 HGV movements (arrival + departure) per hour and to be robust, it will be assumed that all staff and HGVs will travel to the site to and from Carlisle hence, all will be passing the junction (i.e. anything travelling towards Cockermouth will result in less vehicles passing the junction)

5.11 Similarly, the Quarry employs 14 members of staff and it is assumed that 10 all arrive/leave by single-occupancy vehicle from / to Carlisle.

5.12 Flow Diagrams / trips distribution are attached in Appendix 5.

High Close Quarry

5.13 High Close quarry is anticipated to generate up to 8 HGV movements (arrival + departure) per hour which in line with para 4.13 will result in 4HGVs travelling to/from Cockermouth and 4 HGVs to/from Carlisle direction.

5.14 Similarly, the Quarry would employ10 members of staff and it is assumed that they would all arrive via 8 vehicles, 50:50 split between Carlisle and Cockermouth.

5.15 Flow Diagrams / trips distribution are attached in Appendix 5.

A595 / B5301 JUNCTION

	AM			PM		
	Queue (PCU)	Delay (s)	RFC	Queue (PCU)	Delay (s)	RFC
2019						
Stream B-C	0.1	8.09	0.06	0.0	8.49	0.02
Stream B-A	0.3	13.74	0.23	0.2	10.69	0.17
Stream C-AB	0.1	5.37	0.06	0.1	5.08	0.05
2029						
Stream B-C	0.1	8.48	0.07	0.0	8.76	0.02
Stream B-A	0.4	15.49	0.27	0.3	11.65	0.20
Stream C-AB	0.1	5.25	0.07	0.1	5.00	0.06
2019+Comm						
Stream B-C	0.1	8.16	0.06	0.0	8.60	0.02
Stream B-A	0.3	14.14	0.23	0.2	10.99	0.17
Stream C-AB	0.1	5.33	0.06	0.1	5.08	0.06
2029+Comm						
Stream B-C	0.1	8.56	0.07	0.0	8.88	0.02
Stream B-A	0.4	15.99	0.27	0.3	12.01	0.20
Stream C-AB	0.1	5.21	0.07	0.1	5.00	0.06
2029+Comm+Dev						
Stream B-C	0.1	8.87	0.08	0.1	9.20	0.04
Stream B-A	0.5	17.07	0.30	0.3	13.29	0.23
Stream C-AB	0.3	5.45	0.10	0.2	5.21	0.08

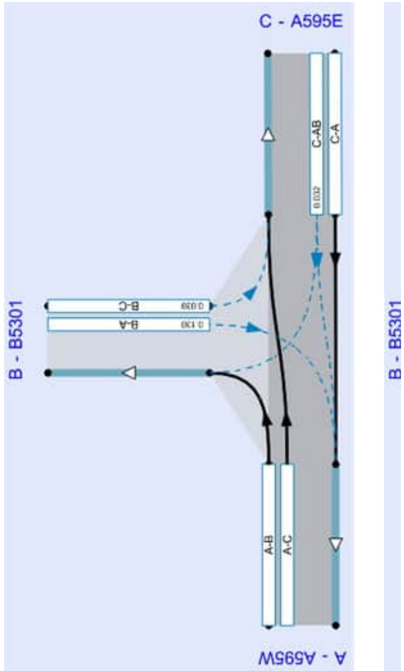


Figure 5.3
Summary Junction Output

5.16 The Picady junction modelling results shown in the above Figure indicate that:

- The Junction will operate well within operational capacity under the ‘Do Nothing’ and ‘Do Development’ assessment scenarios;
- Under the Do Development scenario, the maximum RFC is 0.30 in 2029 which is well within the junction’s operational capacity; there is virtually no increase in queue length and less than 2 seconds additional delay over the Do Nothing scenario; therefore
- In highway terms, the impact of the Development related trips is considered negligible.

Road Safety - Mitigation

5.17 As previously detailed, the Applicant is prepared to have a condition imposed, secured by a Section 106 Agreement whereby:

- All High Close Quarry HGVs will turn left out and right in ONLY, i.e. will NOT travel through Parsonby;
- All existing Thomas Armstrong HGVs carrying limestone aggregates travelling through Parsonby would cease to do so upon granting of this planning permission;

- Relocate the existing quarry access to a new location as detailed in Appendix 2 including improved geometry;
- Improve the road surface to the south of the proposed site access (Figure 1.1) to level the road surface and improve road safety to the local community and all road users;
- Thomas Armstrong drivers will be explicitly instructed to operate and maintain their vehicles with the utmost regard for the environment and road safety. Drivers are required to adopt a courteous driving policy within the site boundary, the surrounding villages and on the highway network; and
- All vehicles transporting mineral from the site shall be securely sheeted so that no material may be spilt on the public highway.

Residual Impact

5.18 Taking into account all the factors assessed in this report and the mitigation measures outlined above, a final analysis of the impacts resulting from the development proposals has been carried out and is summarised below:

- Junction Capacity — No Impact;
- Link Capacity — No Impact;
- Driver Delay — No Impact;
- Environmental Impact — No Impact;
- Road Safety — No Impact;
- Public Rights of Way — No Impact; and
- Overall — No Impact.

5.19 It is therefore considered that the quarry would have no material impact in respect of highways and transport.

6.1 This report described the development options and surrounding existing facilities such as public transport services and cycleways. These sections demonstrate that taking into consideration the nature of the development proposals, the quarry complies with the local and national guidelines and policies.

6.2 Additionally, the report tests the impact of the quarry on the highway network to establish the extent of any significant highway impacts and evaluates compliance with the NPPF transport planning 'test' which prevents refusal on transport grounds unless the impacts of development are 'severe'.

6.3 Assuming annual tonnage of the maximum 250,000 tonnes per year the entire quarry payload per day, the 74 daily HGV movements are equivalent to 8 movements per hour which is one every 7.5 minutes.

6.4 Detailed analysis and impact assessment concluded that:

a. The highway network is adequate to support the vehicle movements for the proposed quarry, so as not to be detrimental to highway safety of road users;

b. Mitigation proposals offered will improve road safety over existing conditions particularly as a result of reduced HGV movements through Parsonby; and

c. The development does not result in an unacceptable impact on highway safety or a residual cumulative impact on the road network that is severe and thus should not be refused on transport grounds, as set out in paragraph 109 of the Revised NPPF.

6.5 It is therefore concluded that the proposed development will meet all safety, capacity and Planning Policy requirements and will have no material impact onto the highway network, meeting the NPPF guidelines in which case, there should be no transport / highways reasons for refusal of planning permission.

TERM	DEFINITION
AADT	**Annual Average Daily Traffic**. Average of 24 hours flows, seven days a week, for all days within the year
AAWT	**Annual Average Weekday Traffic**. As AADT but for five days, (Monday to Friday) only.
Accessibility	Accessibility can be defined as 'ease of reaching'. The accessibility objective is concerned with increasing the ability with which people in different locations, and with differing availability of transport, can reach different types of facility.
AM Peak	Denoting the morning peak period
AST	**Appraisal Summary Table**. This records the impacts of the scheme according to the Government's five key objects for transport, as defined in DFT guidance contained on its Transport Analysis Guidance web pages, Web TAG
ATC	**Automatic Traffic Count**, a machine which measures traffic flow at a point in the road.
AWT	**Average Weekday Traffic**. Average of Monday to Friday 24 hour flows.
CRF	**Congestion Reference Flow**. AADT flow at which a road is likely to be congested in the peak periods of an average day.
DfT	**Department for Transport**
DMRB	**Design Manual for Roads and Bridges**
FTP	**Framework Travel Plan**
HGV	**Heavy Goods Vehicle**
Highways Agency	An Executive Agency of the Department for Transport, responsible for operating maintaining and improving the strategic road network in England
IP	**Inter Peak**. The time between the AM and PM peaks
Light vehicle	Not a HGV. For traffic flow data. It is a vehicle less than 5.2m in length
MfS	**Manual for Streets**
NRTF	**National Road Traffic Forecast**. This document defines the latest forecasts of the growth in the volume of motor traffic.
OGV1,OGV2	**Other Goods Vehicle**. OGV1=Goods Vehicles with 2 or 3 axies, OGV2=Goods vehicle.
PIC	**Personal Injury Collisions**
PM Peak	Evening peak period.
Severance	Community severance is the separation of adjacent areas by road or heavy traffic, causing negative impact on non-motorised users, particularly pedestrians.
SRN	Strategic Road Network
TA / TIA	**Transport Assessment / Traffic Impact Assessment**
TP	**Travel Plan**
TS	**Transport Statement**
TAG	Transport Analysis Guidance, as defined in Web TAG
TEMPRO	**Trip End Model Presentation Program**, DFT software which provides forecast data on trips for transport planning purposes.
VPD	**Vehicles Per Day**
Web TAG	DFT's website for guidance on transport studies at http://www.webtag.org.uk/

TRANSPORT POLICY CONTEXT

National Transport Policy

i. The Government's long term strategy for transport is set out in "The Future of Transport – a Network for 2030" (DfT White Paper, 2004). An underlying objective of the strategy set out in the White Paper is to deal with the pressures of increasing demand for travel by striking the right balance between environmental, economic and social objectives, now and into the future. In terms of the road network, this means:

- New capacity, where it is needed and justified, on environmental and social grounds;
- Locking in the benefits of new capacity through measures such as high occupancy vehicle lanes and tolling, where appropriate;
- The Government leading the debate on road pricing and the opportunity this gives to motorists to make better choices;
- Better management of the network; and
- Using new technology, so the travelling public can make smarter journey choices.

ii. In terms of enhancing local travel this means:

- Freer-flowing local roads delivered through measures such as congestion charging;
- More, and more reliable buses enjoying more road space;
- Demand-responsive bus services that provide accessibility in areas that cannot support conventional services;
- Looking at ways to make services more accessible, so that people have a real choice about how and when they travel;
- Tackling the environmental impacts of travel by encouraging more sustainable travel choices through promoting the use of construction travel plans, workplace travel plans and personalised journey planning, and encouraging people to consider alternatives to using their cars, and
- Creating a culture and improved quality of local environment, so that cycling and walking are seen as an alternative to car travel for short journeys, particularly for children.

iii. The Local Transport White Paper, 'Creating Growth, Cutting Carbon: Making Sustainable Local Transport Happen' (January 2011) reiterates the Government's vision for a sustainable local transport system that supports the economy and reduces carbon emissions. It explains how the Government is placing localism at the heart of the transport agenda, taking measures to empower local authorities when it comes to tackling these issues in their areas. The White Paper also underlines the Government's direct support to local authorities, including through the Local Sustainable Transport Fund.

iv. The five National Transport Goals are:

- Goal 1: To reduce transport's emissions of carbon dioxide and other greenhouse gases, with the desired outcome of tackling climate change;
- Goal 2: To support economic competitiveness and growth, by delivering reliable and efficient transport networks;

- Goal 3: To promote greater equality of opportunity for all citizens, with the desired outcome of achieving a fairer society;
- Goal 4: To contribute to better safety, security and health and longer life expectancy by reducing the risk of death, injury or illness arising from transport, and by promoting travel modes that are beneficial to health; and
- Goal 5: To improve quality of life for transport users and non-transport users, and to promote a healthy natural environment.

National Planning Policy Framework [NPPF] – *para numbering reflects that in the NPPF*

Promoting sustainable transport

102. Transport issues should be considered from the earliest stages of plan-making and development proposals, so that:

    a. the potential impacts of development on transport networks can be addressed;

    b. opportunities from existing or proposed transport infrastructure, and changing transport technology and usage, are realised – for example in relation to the scale, location or density of development that can be accommodated;

    c. opportunities to promote walking, cycling and public transport use are identified and pursued;

    d. the environmental impacts of traffic and transport infrastructure can be identified, assessed and taken into account – including appropriate opportunities for avoiding and mitigating any adverse effects, and for net environmental gains; and

    e. patterns of movement, streets, parking and other transport considerations are integral to the design of schemes, and contribute to making high quality places.

103. The planning system should actively manage patterns of growth in support of these objectives. Significant development should be focused on locations which are or can be made sustainable, through limiting the need to travel and offering a genuine choice of transport modes. This can help to reduce congestion and emissions, and improve air quality and public health. However, opportunities to maximise sustainable transport solutions will vary between urban and rural areas, and this should be taken into account in both plan-making and decision-making.

104. Planning policies should:

    a. support an appropriate mix of uses across an area, and within larger scale sites, to minimise the number and length of journeys needed for employment, shopping, leisure, education and other activities;

    b. be prepared with the active involvement of local highways authorities, other transport infrastructure providers and operators and neighbouring councils, so that strategies and investments for supporting sustainable transport and development patterns are aligned;

c. identify and protect, where there is robust evidence, sites and routes which could be critical in developing infrastructure to widen transport choice and realise opportunities for large scale development;

d. provide for high quality walking and cycling networks and supporting facilities such as cycle parking (drawing on Local Cycling and Walking Infrastructure Plans);

e. provide for any large scale transport facilities that need to be located in the area, and the infrastructure and wider development required to support their operation, expansion and contribution to the wider economy. In doing so they should take into account whether such development is likely to be a nationally significant infrastructure project and any relevant national policy statements; and

f. recognise the importance of maintaining a national network of general aviation airfields, and their need to adapt and change over time – taking into account their economic value in serving business, leisure, training and emergency service needs, and the Government's General Aviation Strategy.

105. If setting local parking standards for residential and non-residential development, policies should take into account:

a. the accessibility of the development;

b. the type, mix and use of development;

c. the availability of and opportunities for public transport;

d. local car ownership levels; and

e. the need to ensure an adequate provision of spaces for charging plug-in and other ultra-low emission vehicles.

106. Maximum parking standards for residential and non-residential development should only be set where there is a clear and compelling justification that they are necessary for managing the local road network, or for optimising the density of development in city and town centres and other locations that are well served by public transport (in accordance with chapter 11 of this Framework). In town centres, local authorities should seek to improve the quality of parking so that it is convenient, safe and secure, alongside measures to promote accessibility for pedestrians and cyclists.

107. Planning policies and decisions should recognise the importance of providing adequate overnight lorry parking facilities, taking into account any local shortages, to reduce the risk of parking in locations that lack proper facilities or could cause a nuisance. Proposals for new or expanded distribution centres should make provision for sufficient lorry parking to cater for their anticipated use.

Considering development proposals

108. In assessing sites that may be allocated for development in plans, or specific applications for development, it should be ensured that:

   a. appropriate opportunities to promote sustainable transport modes can be – or have been – taken up, given the type of development and its location;

   b. safe and suitable access to the site can be achieved for all users; and

   c. any significant impacts from the development on the transport network (in terms of capacity and congestion), or on highway safety, can be cost effectively mitigated to an acceptable degree.

109. Development should only be prevented or refused on highways grounds if there would be an unacceptable impact on highway safety, or the residual cumulative impacts on the road network would be severe.

110. Within this context, applications for development should:

   a. give priority first to pedestrian and cycle movements, both within the scheme and with neighbouring areas; and second – so far as possible – to facilitating access to high quality public transport, with layouts that maximise the catchment area for bus or other public transport services, and appropriate facilities that encourage public transport use;

   b. address the needs of people with disabilities and reduced mobility in relation to all modes of transport;

   c. create places that are safe, secure and attractive – which minimise the scope for conflicts between pedestrians, cyclists and vehicles, avoid unnecessary street clutter, and respond to local character and design standards;

   d. allow for the efficient delivery of goods, and access by service and emergency vehicles; and

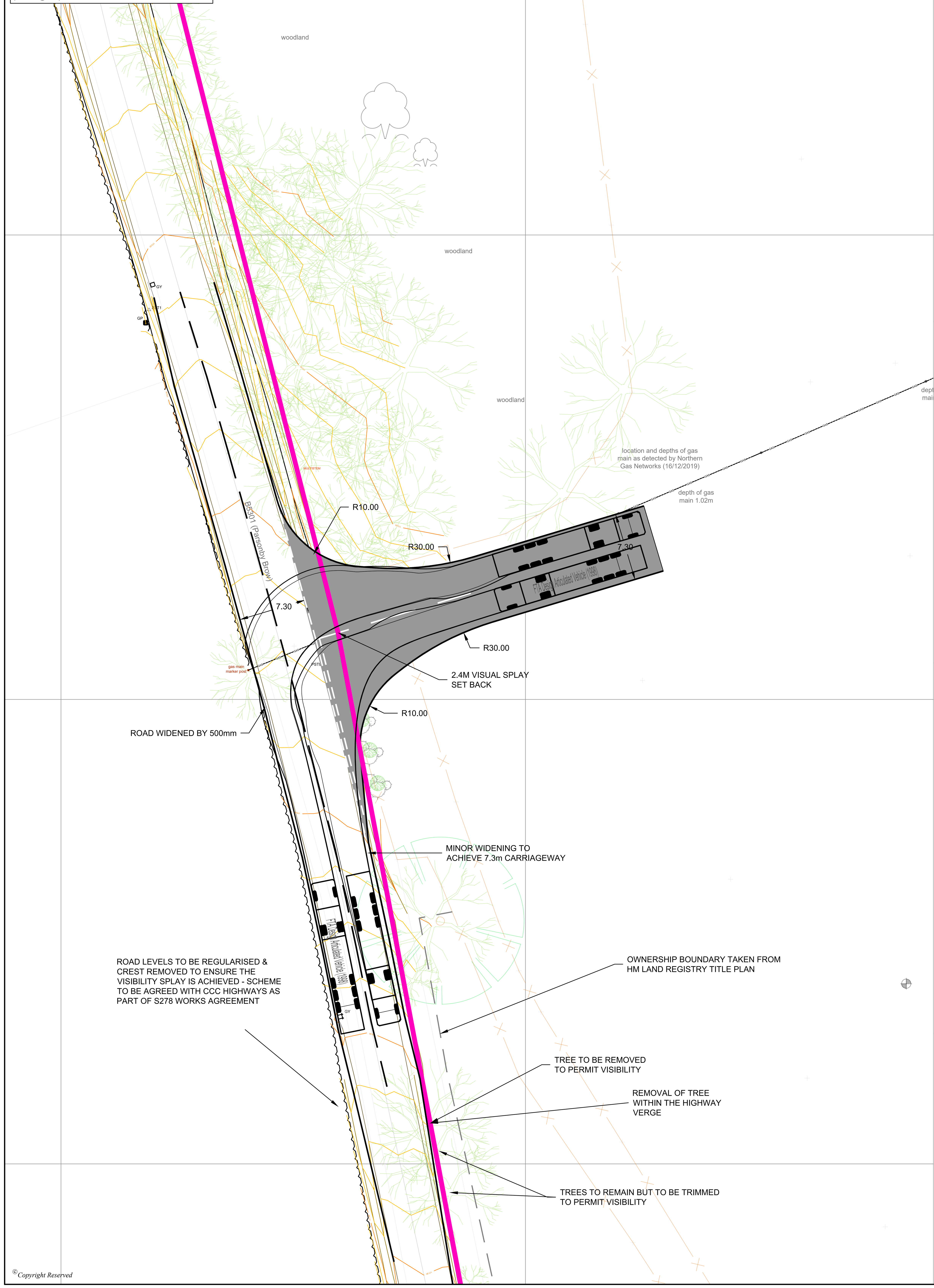
   e. be designed to enable charging of plug-in and other ultra-low emission vehicles in safe, accessible and convenient locations.

111. All developments that will generate significant amounts of movement should be required to provide a travel plan, and the application should be supported by a transport statement or transport assessment so that the likely impacts of the proposal can be assessed.

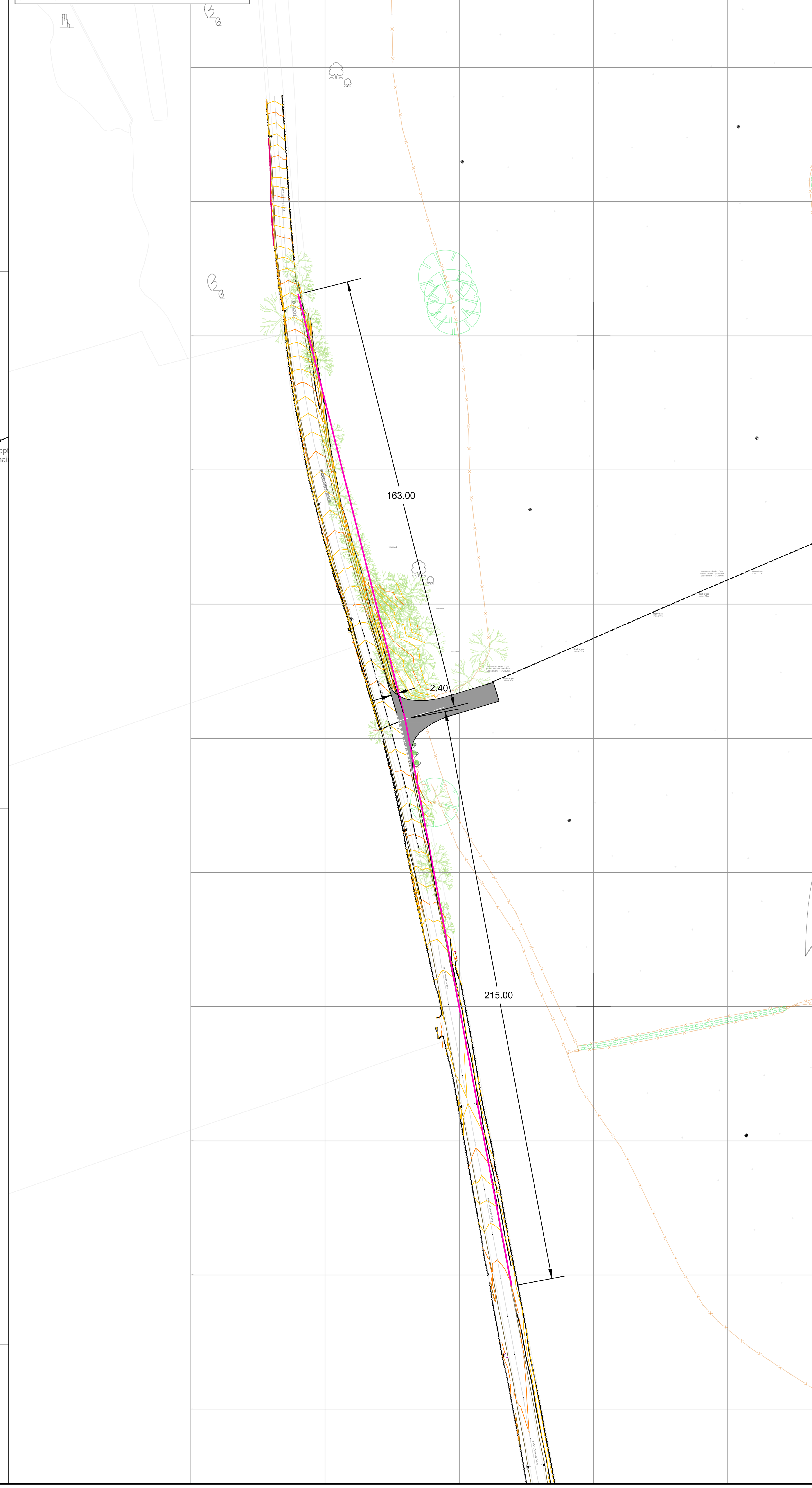
LOCAL POLICIES

v. Please refer to planning statement

PROPOSED ACCESS GENERAL ARRANGEMENT
(1:250 @ A1)



PROPOSED VISIBILITY SPLAY
(1:1000 @ A1)



DO NOT SCALE FROM THIS DRAWING

NOTES

1. ALL DESIGN IS PRELIMINARY AND SUBJECT TO DETAILED DESIGN

REVISION	DETAILS	DATE
A	UPDATED BASED ON TOPO	JAN 20

CLIENT
STEPHENSON HALLIDAY

PROJECT
HIGH CLOSE QUARRY

DRAWING TITLE
PROPOSED GENERAL ARRANGEMENT
OPTION 3

PRELIMINARY

DRG No.	REV
003	A

DRG SIZE	SCALE	DATE
A1	AS SHOWN	07/01/20

iprt Intelligent Transport Planning Solutions

Development Control - Planning Dept address

From:	Harrison, Andrew
Sent:	04 May 2017 10:19
To:	Development Control - Planning Dept address
Cc:	DM&LLFA West
Subject:	RE: Consultation on a Request for a Scoping Opinion - High Close Quarry, Plumbland, Aspatria, Cumbria
Follow Up Flag:	Follow up
Flag Status:	Flagged

Dear Rachel

Having met with the applicant on site it is refreshing to see that the original access has been scrapped in favour of the documented access that was proposed during site meetings. This is welcomed.

Other observations regarding the proposals would be the management of water on and from the site once excavation/construction works for the site begins and intensification on the highway network as a result of the proposals.

It is assumed that suitable conditions will be attached to the application to mitigate these impacts.

In summary I have no objections to the proposed works.

Kind regards

Andrew

Andrew Harrison
MCIHT
Development Management officer |
Environment | Cumbria County Council |
Parkhouse Building | Kingmoor Business Park | Carlisle | CA6 4SJ
[redacted]
Email: lfrm@cumbria.gov.uk

From: Development Control - Planning Dept address
Sent: 28 April 2017 15:29
Cc: Development Control - Planning Dept address
Subject: Consultation on a Request for a Scoping Opinion - High Close Quarry, Plumbland, Aspatria, Cumbria

Dear Sir/Madam,

Town & Country Planning (Environmental Impact Assessment) Regulations 2011

Location: **High Close Quarry, Plumbland, Aspatria, Cumbria**

Proposal: Proposed application for the determination of conditions under the Environment Act 1995 to which the dormant minerals planning permission reference CA49 (granted permission by the former Cumberland County Council on the 8th December 1954) is to be subject. The proposal will also include an area for plant, stockpiling and storage which all relate to the quarrying of limestone. Also including a planning application for an improved site access as the former access was not considered suitable by the Highway
Ref No: Scoping2017

Cumbria County Council have received a request to provide a scoping opinion in relation to the above project in accordance with the above regulations.

Please find attached a copy of the information submitted by the applicant to inform the opinion.

I should be grateful to receive any observations you may wish to make concerning the proposal so as to help inform the County Council's Scoping Opinion.

The County Planning Authority has a statutory duty to provide scoping opinions within 5 weeks of their receipt, and in order to do this it is essential that I receive prompt replies to this consultation. If you wish to comment will you therefore please do so **by 19 May 2016.** Please contact me if you require additional time to respond.

Please note that this communication is being issued via email only.

Should you have any queries as regards any of the above then please do not hesitate to contact me.

Kind Regards

Mrs Rachel Brophy BA(Hons) MA MRTPI
Planning Officer
Development Control

Automatic Classified Counts, Parsonby

LOCATION: B5301

Direction : NORTHBOUND

Friday 13/03/2020	VEHICLE CLASSIFICATION													TOTAL
Hr Ending	1	2	3	4	5	6	7	8	9	10	11	12	13	
1	3	0	0	0	0	0	0	0	0	0	0	0	0	3
2	2	0	0	0	0	0	0	0	0	0	0	0	0	2
3	2	0	0	0	1	0	0	0	0	0	0	0	0	3
4	1	0	0	0	0	0	0	0	0	0	0	0	0	1
5	1	0	0	0	0	0	1	0	0	0	1	0	0	3
6	19	1	0	0	0	0	0	0	0	0	0	0	0	20
7	12	1	0	0	0	0	0	0	1	0	0	0	0	14
8	23	4	0	0	1	0	0	0	0	0	1	1	0	30
9	44	6	1	0	1	0	0	0	0	0	1	0	0	53
10	24	9	0	0	2	0	0	0	2	0	1	1	0	39
11	38	12	0	0	1	0	1	0	0	0	1	0	0	53
12	42	15	1	1	0	0	0	1	1	0	1	1	0	63
13	34	8	0	0	0	0	0	0	2	0	1	0	0	45
14	55	4	0	0	1	0	0	1	1	0	1	0	0	63
15	56	9	0	0	0	0	0	0	0	0	0	0	0	65
16	66	12	0	0	0	0	0	0	0	0	1	0	0	79
17	66	22	0	0	0	0	0	0	0	0	0	0	0	88
18	64	6	0	0	0	0	0	0	0	0	0	2	0	72
19	29	5	0	0	0	0	0	1	0	0	0	0	0	35
20	33	4	0	0	1	0	0	0	0	0	0	0	0	38
21	15	3	0	0	0	0	0	0	0	0	0	0	0	18
22	15	1	0	0	0	0	0	0	0	0	0	0	0	16
23	15	0	0	0	0	0	0	0	0	0	0	0	0	15
24	11	0	0	0	0	0	0	0	0	0	0	0	0	11
7-19	541	112	2	1	6	0	1	3	6	0	8	5	0	685
6-22	616	121	2	1	7	0	1	3	7	0	8	5	0	771
6-24	642	121	2	1	7	0	1	3	7	0	8	5	0	797
0-24	670	122	2	1	8	0	2	3	7	0	9	5	0	829

Direction : SOUTHBOUND

Friday 13/03/2020	VEHICLE CLASSIFICATION													TOTAL
Hr Ending	1	2	3	4	5	6	7	8	9	10	11	12	13	
1	3	0	0	0	0	0	0	0	1	0	0	0	0	4
2	2	0	0	0	0	0	0	0	0	0	0	0	0	2
3	2	0	0	0	0	0	0	0	0	0	0	0	0	2
4	1	0	0	0	0	0	0	0	0	0	0	0	0	1
5	6	0	0	0	1	0	0	0	0	0	0	0	0	7
6	10	1	0	0	0	0	0	0	0	0	0	1	0	12
7	38	4	0	0	1	0	0	0	0	0	0	0	0	43
8	73	8	1	0	0	0	0	0	0	0	0	1	0	83
9	69	24	0	0	2	0	0	0	0	0	0	0	0	95
10	49	10	0	0	2	0	0	1	0	0	0	1	0	63
11	48	15	0	0	1	0	0	0	1	0	1	0	0	66
12	47	7	0	0	0	0	0	0	2	0	1	2	0	59
13	55	9	0	0	1	0	0	0	1	0	0	0	0	66
14	37	11	0	0	1	0	0	0	0	0	0	0	0	49
15	54	8	0	0	2	0	0	0	1	0	1	1	0	67
16	46	6	0	0	1	0	0	0	0	0	0	2	0	55
17	37	7	1	0	0	0	0	0	1	0	1	1	0	48
18	41	4	0	0	2	0	0	0	0	0	0	0	0	47
19	52	4	0	0	0	0	0	0	0	0	0	0	0	56
20	20	2	0	0	0	0	0	0	0	0	0	0	0	22
21	13	1	0	0	1	0	0	0	0	0	0	0	0	15
22	15	2	0	0	0	0	0	0	0	0	0	0	0	17
23	6	2	0	0	0	0	0	0	0	0	0	0	0	8
24	4	0	0	0	0	0	0	0	0	0	0	0	0	4
7-19	608	113	2	0	12	0	0	1	6	0	4	8	0	754
6-22	694	122	2	0	14	0	0	1	6	0	4	8	0	851
6-24	704	124	2	0	14	0	0	1	6	0	4	8	0	863
0-24	728	125	2	0	15	0	0	1	7	0	4	9	0	891

Automatic Classified Counts, Parsonby

LOCATION: B5301

Direction : NORTHBOUND

Saturday 14/03/2020	VEHICLE CLASSIFICATION													TOTAL
Hr Ending	1	2	3	4	5	6	7	8	9	10	11	12	13	
1	5	1	0	0	0	0	0	0	0	0	0	0	0	6
2	1	1	0	0	0	0	0	0	0	0	0	0	0	2
3	3	0	0	0	0	0	0	0	0	0	0	0	0	3
4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	1	0	0	0	0	0	0	0	0	0	0	0	0	1
6	5	0	0	0	0	0	0	0	0	0	0	0	0	5
7	8	0	0	0	0	0	0	0	0	0	0	0	0	8
8	3	3	0	0	0	0	0	0	0	0	0	0	0	6
9	18	5	2	0	1	0	0	0	1	0	0	0	0	27
10	18	1	0	0	0	0	0	0	0	0	0	0	0	19
11	36	7	0	0	0	0	1	0	0	0	0	1	0	45
12	29	8	0	0	0	0	0	0	0	0	0	0	0	37
13	39	4	0	0	0	0	0	0	1	0	0	0	0	44
14	43	5	0	0	0	0	0	0	0	0	0	0	0	48
15	74	10	0	0	0	0	0	0	1	0	1	0	0	86
16	45	3	0	0	0	0	0	0	0	0	0	0	0	48
17	41	8	0	0	0	0	0	0	0	0	0	0	0	49
18	40	9	0	0	0	0	0	0	0	0	0	1	0	50
19	22	4	0	0	0	0	0	0	0	0	0	0	0	26
20	21	4	0	0	0	0	0	0	0	0	0	2	0	27
21	13	3	0	0	0	0	0	0	1	0	0	0	0	17
22	10	1	0	0	0	0	0	0	0	0	0	0	0	11
23	10	0	0	0	0	0	0	0	0	0	0	0	0	10
24	8	0	0	0	0	0	0	0	0	0	0	0	0	8
7-19	408	67	2	0	1	0	1	0	3	0	1	2	0	485
6-22	460	75	2	0	1	0	1	0	4	0	1	4	0	548
6-24	478	75	2	0	1	0	1	0	4	0	1	4	0	566
0-24	493	77	2	0	1	0	1	0	4	0	1	4	0	583

Direction : SOUTHBOUND

Saturday 14/03/2020	VEHICLE CLASSIFICATION													TOTAL
Hr Ending	1	2	3	4	5	6	7	8	9	10	11	12	13	
1	2	0	0	0	0	0	0	0	0	0	0	0	0	2
2	3	0	0	0	0	0	0	0	0	0	0	0	0	3
3	1	0	0	0	0	0	0	0	0	0	0	0	0	1
4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	5	1	0	0	0	0	0	0	0	0	0	0	0	6
6	4	0	0	0	0	0	0	0	0	0	0	0	0	4
7	18	2	0	0	0	0	0	0	0	0	0	0	0	20
8	18	4	0	0	0	0	0	0	0	0	0	0	0	22
9	27	9	0	0	0	0	0	0	1	0	0	0	0	37
10	41	7	0	0	0	0	0	0	0	0	0	0	0	48
11	43	9	0	0	0	0	0	0	0	0	0	0	0	52
12	39	6	0	0	0	0	0	0	1	0	0	0	0	46
13	29	1	0	0	0	0	0	0	0	0	0	0	0	30
14	39	7	0	0	0	0	0	0	0	0	0	0	0	46
15	38	6	0	0	0	0	0	0	0	0	0	0	0	44
16	27	6	0	0	0	0	0	0	1	0	0	0	0	34
17	36	2	0	0	0	0	0	0	0	0	0	0	0	38
18	41	1	0	0	0	0	0	0	0	0	0	0	0	42
19	27	2	0	0	0	0	0	0	0	0	0	0	0	29
20	21	2	0	0	0	0	0	0	0	0	0	0	0	23
21	8	0	0	0	0	0	0	0	0	0	0	0	0	8
22	10	0	0	0	0	0	0	0	0	0	0	0	0	10
23	8	0	0	0	0	0	0	0	0	0	0	0	0	8
24	6	0	0	0	0	0	0	0	0	0	0	0	0	6
7-19	405	60	0	0	0	0	0	0	3	0	0	0	0	468
6-22	462	64	0	0	0	0	0	0	3	0	0	0	0	529
6-24	476	64	0	0	0	0	0	0	3	0	0	0	0	543
0-24	491	65	0	0	0	0	0	0	3	0	0	0	0	559

Automatic Classified Counts, Parsonby

LOCATION: B5301

Direction : NORTHBOUND

Sunday 15/03/2020	VEHICLE CLASSIFICATION													TOTAL
Hr Ending	1	2	3	4	5	6	7	8	9	10	11	12	13	
1	4	0	0	0	0	0	0	0	0	0	0	0	0	4
2	2	0	0	0	0	0	0	0	0	0	0	0	0	2
3	6	0	0	0	0	0	0	0	0	0	0	0	0	6
4	1	0	0	0	0	0	0	0	0	0	0	1	0	2
5	1	0	0	0	0	0	0	0	0	0	0	0	0	1
6	5	0	0	0	0	0	0	0	0	0	0	0	0	5
7	5	0	0	0	0	0	0	0	0	0	0	0	0	5
8	5	1	0	0	0	0	0	0	0	0	0	0	0	6
9	7	0	0	0	0	0	0	0	0	0	0	0	0	7
10	12	4	0	0	0	0	0	0	1	0	0	0	0	17
11	10	2	0	0	1	0	0	0	0	0	0	0	0	13
12	36	4	0	0	0	0	1	0	0	0	0	1	0	42
13	38	10	0	0	2	0	0	0	0	0	0	0	0	50
14	34	7	0	0	0	0	0	0	1	0	0	0	0	42
15	33	8	0	0	1	0	0	0	0	0	0	0	0	42
16	40	2	0	0	0	0	1	0	0	0	0	0	0	43
17	29	5	0	0	0	0	0	0	0	0	0	0	0	34
18	42	4	0	0	0	0	0	0	0	0	0	1	0	47
19	21	3	0	0	0	0	0	0	0	0	0	0	0	24
20	17	1	0	0	0	0	0	0	0	0	0	0	0	18
21	16	0	0	0	0	0	0	0	0	0	0	0	0	16
22	5	1	0	0	1	0	0	0	0	0	0	0	0	7
23	5	0	0	0	0	0	0	0	0	0	0	0	0	5
24	3	0	0	0	0	0	0	0	0	0	0	0	0	3
7-19	307	50	0	0	4	0	2	0	2	0	0	2	0	367
6-22	350	52	0	0	5	0	2	0	2	0	0	2	0	413
6-24	358	52	0	0	5	0	2	0	2	0	0	2	0	421
0-24	377	52	0	0	5	0	2	0	2	0	0	3	0	441

Direction : SOUTHBOUND

Sunday 15/03/2020	VEHICLE CLASSIFICATION													TOTAL
Hr Ending	1	2	3	4	5	6	7	8	9	10	11	12	13	
1	6	1	0	0	0	0	0	0	0	0	0	0	0	7
2	3	0	0	0	0	0	0	0	0	0	0	0	0	3
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	3	0	0	0	0	0	0	0	0	0	0	0	0	3
5	2	2	0	0	0	0	0	0	0	0	0	0	0	4
6	2	1	0	0	0	0	0	0	0	0	0	0	0	3
7	8	1	0	0	0	0	0	0	0	0	0	0	0	9
8	8	1	0	0	0	0	0	0	0	0	0	0	0	9
9	17	2	0	0	0	0	1	0	1	0	0	0	0	21
10	34	2	0	0	1	0	0	0	0	0	0	0	0	37
11	29	5	0	0	1	0	0	0	0	0	0	0	0	35
12	42	6	0	0	0	0	0	0	1	0	0	0	0	49
13	24	8	0	0	0	0	1	0	0	0	0	0	0	33
14	38	3	0	0	0	0	0	0	0	0	0	0	0	41
15	27	7	0	0	0	0	1	0	0	0	0	0	0	35
16	26	5	0	0	0	0	0	0	0	0	0	0	0	31
17	28	2	0	0	0	0	0	0	0	0	0	0	0	30
18	21	2	0	0	0	0	0	0	0	0	0	0	0	23
19	25	3	0	0	0	0	0	0	0	0	0	0	0	28
20	9	5	0	0	0	0	0	0	0	0	0	0	0	14
21	12	1	0	0	0	0	0	0	0	0	0	0	0	13
22	7	0	0	0	0	0	0	0	0	0	0	0	0	7
23	2	0	0	0	0	0	0	0	0	0	0	0	0	2
24	3	0	0	0	0	0	0	0	1	0	0	0	0	4
7-19	319	46	0	0	2	0	3	0	2	0	0	0	0	372
6-22	355	53	0	0	2	0	3	0	2	0	0	0	0	415
6-24	360	53	0	0	2	0	3	0	3	0	0	0	0	421
0-24	376	57	0	0	2	0	3	0	3	0	0	0	0	441

Automatic Classified Counts, Parsonby

LOCATION: B5301

Direction : NORTHBOUND

Monday 16/03/2020	VEHICLE CLASSIFICATION													TOTAL
Hr Ending	1	2	3	4	5	6	7	8	9	10	11	12	13	
1	1	0	0	0	0	0	0	0	0	0	0	0	0	1
2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0	1	0	0	0	0	0	0	0	0	0	0	0	1
6	8	3	0	0	0	0	0	0	0	0	0	0	0	11
7	11	1	0	0	1	0	0	0	0	0	0	0	0	13
8	38	6	0	1	0	0	0	1	0	0	0	1	0	47
9	38	11	3	0	0	0	1	1	1	0	0	1	0	56
10	24	4	0	0	1	0	0	1	0	0	0	0	0	30
11	19	10	2	0	1	0	0	0	1	0	1	0	0	34
12	38	9	0	0	0	0	1	0	0	0	0	1	0	49
13	39	7	1	0	1	0	0	0	1	0	0	1	0	50
14	27	2	1	0	0	0	1	0	1	0	0	0	0	32
15	42	7	0	0	1	0	0	0	0	0	1	0	0	51
16	45	8	0	0	0	0	1	0	2	0	0	0	0	56
17	61	19	0	0	0	0	1	0	1	0	0	0	0	82
18	69	12	0	0	0	0	1	0	0	0	0	1	0	83
19	25	10	0	0	0	0	0	0	1	0	0	0	0	36
20	14	2	0	0	0	0	0	0	0	0	0	0	0	16
21	12	2	0	0	0	0	0	0	0	0	0	0	0	14
22	5	3	0	0	0	0	0	0	0	0	0	0	0	8
23	2	1	0	0	0	0	0	0	0	0	0	0	0	3
24	1	1	0	0	0	0	0	0	0	0	0	0	0	2
7-19	465	105	7	1	4	0	6	3	8	0	2	5	0	606
6-22	507	113	7	1	5	0	6	3	8	0	2	5	0	657
6-24	510	115	7	1	5	0	6	3	8	0	2	5	0	662
0-24	519	119	7	1	5	0	6	3	8	0	2	5	0	675

Direction : SOUTHBOUND

Monday 16/03/2020	VEHICLE CLASSIFICATION													TOTAL
Hr Ending	1	2	3	4	5	6	7	8	9	10	11	12	13	
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	1	0	0	0	0	0	0	0	0	0	0	0	0	1
3	1	0	0	0	0	0	0	0	0	0	0	0	0	1
4	1	0	0	0	0	0	0	0	0	0	0	0	0	1
5	7	2	0	0	0	0	0	0	0	0	0	0	0	9
6	11	1	0	0	0	0	0	0	0	0	0	0	0	12
7	24	6	0	0	0	0	0	0	0	0	0	0	0	30
8	68	14	0	0	0	0	0	0	0	0	0	0	0	82
9	66	28	1	1	0	0	0	0	0	0	0	0	0	96
10	50	10	0	0	0	0	0	0	0	0	0	1	0	61
11	41	5	0	0	0	0	0	0	1	0	0	0	0	47
12	39	8	1	0	0	0	0	0	1	0	0	1	0	50
13	30	5	1	0	2	0	0	0	0	0	1	2	0	41
14	35	6	2	0	0	0	1	0	0	0	0	1	0	45
15	32	5	0	0	0	0	0	0	0	0	0	1	0	38
16	29	8	0	0	3	0	0	0	0	0	0	0	0	40
17	45	6	0	0	1	0	0	0	1	0	0	1	0	54
18	34	6	0	0	1	0	0	0	0	0	0	0	0	41
19	29	1	0	0	0	0	0	0	0	0	0	0	0	30
20	11	1	0	0	0	0	0	0	0	0	0	0	0	12
21	6	1	0	0	0	0	0	0	0	0	0	0	0	7
22	5	2	0	0	0	0	0	0	1	0	0	0	0	8
23	6	0	0	0	0	0	0	0	0	0	0	0	0	6
24	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7-19	498	102	5	1	7	0	1	0	3	0	1	7	0	625
6-22	544	112	5	1	7	0	1	0	4	0	1	7	0	682
6-24	550	112	5	1	7	0	1	0	4	0	1	7	0	688
0-24	571	115	5	1	7	0	1	0	4	0	1	7	0	712

Automatic Classified Counts, Parsonby

LOCATION: B5301

Direction : NORTHBOUND

Tuesday 17/03/2020	VEHICLE CLASSIFICATION													TOTAL
Hr Ending	1	2	3	4	5	6	7	8	9	10	11	12	13	
1	1	1	0	0	0	0	0	0	0	0	0	0	0	2
2	4	0	0	0	0	0	0	0	0	0	0	0	0	4
3	2	0	0	0	0	0	0	0	0	0	0	0	0	2
4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	9	1	0	0	0	0	0	0	0	0	0	0	0	10
7	16	4	0	0	0	0	0	0	0	0	1	0	0	21
8	30	4	0	0	1	0	0	0	0	0	1	1	0	37
9	36	7	0	0	0	0	0	0	1	0	1	0	0	45
10	25	18	1	0	0	0	0	0	1	0	0	0	0	45
11	25	11	1	0	2	0	0	0	1	0	1	0	0	41
12	21	4	0	0	0	0	0	0	1	0	0	0	0	26
13	29	6	0	0	1	0	0	0	0	0	1	0	0	37
14	30	2	0	0	0	0	0	0	0	0	0	0	0	32
15	54	10	0	0	1	0	0	0	0	0	2	0	0	67
16	46	9	0	0	1	0	0	0	1	0	3	0	0	60
17	53	14	1	0	2	0	0	0	0	0	1	2	0	73
18	59	15	0	0	3	0	1	0	0	0	0	1	0	79
19	35	6	0	0	0	0	0	0	0	0	0	0	0	41
20	13	1	0	0	0	0	0	0	0	0	0	0	0	14
21	8	1	0	0	0	0	0	0	0	0	0	0	0	9
22	9	2	0	0	0	0	0	0	0	0	0	0	0	11
23	4	0	0	0	0	0	0	0	1	0	0	0	0	5
24	2	0	0	0	0	0	0	0	0	0	0	0	0	2
7-19	443	106	3	0	11	0	1	0	5	0	10	4	0	583
6-22	489	114	3	0	11	0	1	0	5	0	11	4	0	638
6-24	495	114	3	0	11	0	1	0	6	0	11	4	0	645
0-24	511	116	3	0	11	0	1	0	6	0	11	4	0	663

Direction : SOUTHBOUND

Tuesday 17/03/2020	VEHICLE CLASSIFICATION													TOTAL
Hr Ending	1	2	3	4	5	6	7	8	9	10	11	12	13	
1	2	0	0	0	0	0	0	0	0	0	0	0	0	2
2	3	0	0	0	0	0	0	0	0	0	0	0	0	3
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	1	0	0	0	0	0	0	0	0	0	0	0	0	1
5	6	1	0	0	0	0	0	0	0	0	0	0	0	7
6	8	2	0	0	0	0	0	0	0	0	0	0	0	10
7	35	10	0	0	0	0	0	0	0	0	0	0	0	45
8	50	15	0	0	1	0	0	0	0	0	0	1	0	67
9	69	16	0	0	0	0	0	0	0	0	0	0	0	85
10	36	10	0	0	1	0	1	0	0	0	1	1	0	50
11	34	10	1	0	2	0	0	0	2	0	0	2	0	51
12	37	5	0	0	0	0	0	0	2	0	1	1	0	46
13	39	11	1	0	0	0	0	0	0	0	0	0	0	51
14	27	9	0	0	2	0	0	0	0	0	1	1	0	40
15	49	10	0	0	1	0	0	0	1	0	0	0	0	61
16	32	7	0	0	2	0	0	0	2	0	0	1	0	44
17	38	8	1	0	1	0	0	0	0	0	0	0	0	48
18	38	5	0	0	0	0	0	0	0	0	0	0	0	43
19	18	3	0	0	1	0	0	0	0	0	0	0	0	22
20	10	0	0	0	0	0	0	0	0	0	0	0	0	10
21	8	1	0	0	0	0	0	0	0	0	0	0	0	9
22	8	1	0	0	0	0	0	0	0	0	0	0	0	9
23	4	0	0	0	0	0	0	0	0	0	0	0	0	4
24	3	0	0	0	0	0	0	0	0	0	0	0	0	3
7-19	467	109	3	0	11	0	1	0	7	0	3	7	0	608
6-22	528	121	3	0	11	0	1	0	7	0	3	7	0	681
6-24	535	121	3	0	11	0	1	0	7	0	3	7	0	688
0-24	555	124	3	0	11	0	1	0	7	0	3	7	0	711

Automatic Classified Counts, Parsonby

LOCATION: B5301

Direction : NORTHBOUND

Wednesday 18/03/2020	VEHICLE CLASSIFICATION							
Hr Ending	1	2	3	4	5	6	7	8
1	2	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0
6	8	1	0	0	0	0	0	0
7	13	1	0	0	0	0	0	0
8	33	9	1	0	0	0	0	0
9	33	10	0	0	0	0	0	0
10	24	8	0	0	0	0	0	0
11	30	8	0	0	0	0	0	0
12	25	11	0	0	1	0	0	0
13	28	4	0	0	2	0	0	0
14	35	7	0	0	0	0	0	0
15	44	13	0	0	0	0	0	1
16	44	14	0	0	0	0	0	1
17	53	16	0	0	2	0	0	0
18	59	12	0	0	0	0	0	0
19	35	10	0	0	0	0	0	0
20	22	2	0	0	1	0	0	0
21	19	0	0	0	0	0	0	0
22	8	2	0	0	0	0	0	0
23	7	0	0	0	0	0	0	0
24	1	0	0	0	0	0	0	0
7-19	443	122	1	0	5	0	0	2
6-22	505	127	1	0	6	0	0	2
6-24	513	127	1	0	6	0	0	2
0-24	523	128	1	0	6	0	0	2

Direction : SOUTHBOUND

Wednesday 18/03/2020	VEHICLE CLASSIFICATION							
Hr Ending	1	2	3	4	5	6	7	8
1	1	1	0	0	0	0	0	0
2	1	0	0	0	0	0	0	0
3	1	0	0	0	0	0	0	0
4	2	0	0	0	0	0	0	0
5	5	0	0	0	0	0	0	0
6	8	0	0	0	0	0	0	0
7	36	7	0	0	0	0	0	0
8	54	16	0	0	2	0	0	0
9	69	16	0	0	0	0	0	0
10	42	7	0	0	0	0	0	0
11	38	7	0	0	0	0	0	0
12	38	15	0	0	1	0	0	0
13	22	6	0	0	1	0	0	1
14	45	4	0	0	0	0	0	0
15	34	11	0	0	1	0	0	0
16	32	7	0	0	0	0	0	0
17	49	8	0	1	0	0	0	0
18	31	5	0	0	0	0	0	0
19	26	2	0	0	0	0	0	0
20	9	1	0	0	0	0	0	0
21	9	0	0	0	0	0	0	0
22	6	0	0	0	0	0	0	0
23	2	1	0	0	0	0	0	0
24	2	0	0	0	0	0	0	0
7-19	480	104	0	1	5	0	0	1
6-22	540	112	0	1	5	0	0	1
6-24	544	113	0	1	5	0	0	1
0-24	562	114	0	1	5	0	0	1

Automatic Classified Counts, Parsonby

LOCATION: B5301

Direction : NORTHBOUND

Friday 13/03/2020	VEHICLE SPEED (MPH)												TOTAL
Hr Ending	0-10	11-20	21-30	31-35	36-40	41-45	46-50	51-55	56-60	61-70	71-80	81-120	
1	0	0	0	0	0	1	0	1	1	0	0	0	3
2	0	0	0	0	1	1	0	0	0	0	0	0	2
3	0	0	0	0	0	3	0	0	0	0	0	0	3
4	0	0	0	0	0	1	0	0	0	0	0	0	1
5	0	0	1	0	0	1	0	1	0	0	0	0	3
6	0	0	0	1	1	2	4	6	4	2	0	0	20
7	0	0	0	0	1	8	0	1	1	3	0	0	14
8	0	0	0	0	2	4	3	11	7	3	0	0	30
9	0	0	0	0	4	12	12	16	7	2	0	0	53
10	0	0	0	0	3	15	10	7	2	2	0	0	39
11	0	0	1	0	7	12	11	8	11	3	0	0	53
12	0	0	0	6	7	10	16	13	6	3	1	1	63
13	0	1	0	0	1	10	14	13	2	4	0	0	45
14	0	0	0	0	3	12	10	23	11	4	0	0	63
15	0	0	0	0	4	19	17	19	4	0	2	0	65
16	0	0	2	5	5	13	23	17	4	9	1	0	79
17	0	0	1	1	2	15	27	23	9	7	3	0	88
18	0	0	0	1	1	9	19	18	15	9	0	0	72
19	0	0	0	1	3	9	6	6	7	2	1	0	35
20	0	0	0	1	1	11	11	5	3	5	0	1	38
21	0	0	0	0	0	3	5	7	1	2	0	0	18
22	0	0	0	0	2	5	2	4	1	1	1	0	16
23	0	0	0	1	1	1	5	4	2	1	0	0	15
24	0	0	0	0	3	3	1	2	1	1	0	0	11
7-19	0	1	4	14	42	140	168	174	85	48	8	1	685
6-22	0	1	4	15	46	167	186	191	91	59	9	2	771
6-24	0	1	4	16	50	171	192	197	94	61	9	2	797
0-24	0	1	5	17	52	180	196	205	99	63	9	2	829

Direction : SOUTHBOUND

Friday 13/03/2020	VEHICLE SPEED (MPH)												TOTAL
Hr Ending	0-10	11-20	21-30	31-35	36-40	41-45	46-50	51-55	56-60	61-70	71-80	81-120	
1	0	0	0	1	0	1	1	0	1	0	0	0	4
2	0	0	0	0	0	1	1	0	0	0	0	0	2
3	0	0	0	0	0	1	1	0	0	0	0	0	2
4	0	0	0	0	0	0	0	0	1	0	0	0	1
5	0	0	0	0	0	2	1	3	0	0	0	1	7
6	0	0	0	1	2	2	1	3	0	2	1	0	12
7	0	0	0	0	5	9	9	11	6	3	0	0	43
8	0	0	2	5	5	24	15	17	9	3	3	0	83
9	0	0	0	4	7	23	37	13	4	6	1	0	95
10	0	0	3	14	6	9	11	12	7	1	0	0	63
11	0	0	4	5	15	20	13	6	2	1	0	0	66
12	0	0	5	0	8	13	17	9	7	0	0	0	59
13	0	0	4	1	8	11	19	19	3	1	0	0	66
14	0	0	1	4	5	8	10	13	6	2	0	0	49
15	0	0	6	2	4	17	21	12	2	2	1	0	67
16	0	0	1	4	10	12	13	9	6	0	0	0	55
17	0	0	3	1	8	13	7	7	7	2	0	0	48
18	0	0	1	1	6	5	12	14	4	4	0	0	47
19	0	0	0	0	11	18	11	10	4	2	0	0	56
20	0	0	0	0	2	4	7	2	4	2	1	0	22
21	0	0	0	0	0	8	3	4	0	0	0	0	15
22	0	0	0	0	2	5	2	1	5	2	0	0	17
23	0	0	0	0	1	1	2	1	1	2	0	0	8
24	0	0	0	0	1	2	1	0	0	0	0	0	4
7-19	0	0	30	41	93	173	186	141	61	24	5	0	754
6-22	0	0	30	41	102	199	207	159	76	31	6	0	851
6-24	0	0	30	41	104	202	210	160	77	33	6	0	863
0-24	0	0	30	43	106	209	215	166	79	35	7	1	891

Automatic Classified Counts, Parsonby

LOCATION: B5301

Direction : NORTHBOUND

Saturday 14/03/2020	VEHICLE SPEED (MPH)												TOTAL
Hr Ending	0-10	11-20	21-30	31-35	36-40	41-45	46-50	51-55	56-60	61-70	71-80	81-120	
1	0	0	0	0	0	0	2	3	1	0	0	0	6
2	0	0	0	0	0	0	1	0	0	1	0	0	2
3	0	0	0	0	0	1	1	1	0	0	0	0	3
4	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	1	0	0	1
6	0	0	0	0	0	1	0	2	0	1	0	1	5
7	0	0	0	0	0	0	2	0	3	0	2	1	8
8	0	0	0	0	0	1	2	1	1	1	0	0	6
9	0	0	0	1	2	4	7	7	3	3	0	0	27
10	0	0	0	1	1	3	5	4	3	1	1	0	19
11	0	0	0	6	1	10	13	11	1	2	1	0	45
12	0	0	0	0	1	11	9	5	7	3	1	0	37
13	0	0	0	0	1	5	14	14	5	5	0	0	44
14	0	0	1	0	3	9	11	7	10	7	0	0	48
15	0	0	2	3	3	13	13	29	15	8	0	0	86
16	0	0	0	0	1	8	14	10	10	5	0	0	48
17	0	0	0	2	0	7	11	18	5	6	0	0	49
18	0	0	0	0	1	9	10	15	10	5	0	0	50
19	0	0	0	0	3	11	2	3	5	2	0	0	26
20	0	0	1	2	3	7	6	7	1	0	0	0	27
21	0	0	0	1	1	5	3	4	2	1	0	0	17
22	0	0	0	1	2	4	3	0	0	1	0	0	11
23	0	0	0	1	1	5	1	1	1	0	0	0	10
24	0	0	0	2	1	2	1	1	0	1	0	0	8
7-19	0	0	3	13	17	91	111	124	75	48	3	0	485
6-22	0	0	4	17	23	107	125	135	81	50	5	1	548
6-24	0	0	4	20	25	114	127	137	82	51	5	1	566
0-24	0	0	4	20	25	116	131	143	83	54	5	2	583

Direction : SOUTHBOUND

Saturday 14/03/2020	VEHICLE SPEED (MPH)												TOTAL
Hr Ending	0-10	11-20	21-30	31-35	36-40	41-45	46-50	51-55	56-60	61-70	71-80	81-120	
1	0	0	0	0	0	0	1	1	0	0	0	0	2
2	0	0	0	0	0	1	0	1	0	1	0	0	3
3	0	0	0	0	0	0	0	0	0	1	0	0	1
4	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	1	0	0	1	2	1	1	0	6
6	0	0	0	0	0	2	0	0	0	2	0	0	4
7	0	0	0	0	1	2	3	12	2	0	0	0	20
8	0	0	0	0	0	6	9	2	3	0	2	0	22
9	0	3	0	1	0	8	7	14	2	1	1	0	37
10	0	1	0	2	4	11	15	6	4	2	3	0	48
11	0	2	0	2	6	15	13	8	4	2	0	0	52
12	0	0	0	1	1	20	13	9	2	0	0	0	46
13	0	0	0	1	3	8	8	7	0	2	0	1	30
14	0	0	2	0	4	12	18	5	4	0	1	0	46
15	0	0	0	0	5	14	13	7	4	0	0	1	44
16	0	1	1	1	3	12	5	6	4	0	1	0	34
17	0	0	0	0	3	16	13	3	3	0	0	0	38
18	0	0	0	0	2	17	10	7	5	0	1	0	42
19	0	0	0	0	4	11	5	7	2	0	0	0	29
20	0	0	1	2	7	6	3	2	1	1	0	0	23
21	0	0	0	0	0	5	2	0	0	1	0	0	8
22	0	0	0	0	0	3	4	2	0	1	0	0	10
23	0	0	0	3	1	0	2	2	0	0	0	0	8
24	0	0	0	0	0	2	0	3	1	0	0	0	6
7-19	0	7	3	8	35	150	129	81	37	7	9	2	468
6-22	0	7	4	10	43	166	141	97	40	10	9	2	529
6-24	0	7	4	13	44	168	143	102	41	10	9	2	543
0-24	0	7	4	13	45	171	144	105	43	15	10	2	559

Automatic Classified Counts, Parsonby

LOCATION: B5301

Direction : NORTHBOUND

Sunday 15/03/2020	VEHICLE SPEED (MPH)												TOTAL
Hr Ending	0-10	11-20	21-30	31-35	36-40	41-45	46-50	51-55	56-60	61-70	71-80	81-120	
1	0	0	0	0	0	1	1	2	0	0	0	0	4
2	0	0	0	0	0	0	0	2	0	0	0	0	2
3	0	0	0	0	1	5	0	0	0	0	0	0	6
4	0	0	0	0	0	0	0	0	1	1	0	0	2
5	0	0	0	0	0	0	0	1	0	0	0	0	1
6	0	0	0	0	1	2	0	2	0	0	0	0	5
7	0	0	0	0	0	1	1	2	0	1	0	0	5
8	0	0	0	0	0	0	2	3	1	0	0	0	6
9	0	0	0	0	0	1	1	1	0	2	2	0	7
10	0	0	0	0	1	5	7	2	1	1	0	0	17
11	0	0	0	0	1	3	1	5	1	2	0	0	13
12	0	0	0	0	7	8	7	6	9	5	0	0	42
13	0	0	0	0	3	14	11	13	6	2	0	1	50
14	0	0	0	1	3	7	13	8	6	4	0	0	42
15	0	0	0	1	2	9	12	12	4	2	0	0	42
16	0	0	2	0	1	5	11	15	6	3	0	0	43
17	0	0	0	1	3	12	5	6	2	4	0	1	34
18	0	1	2	1	5	4	13	13	4	2	2	0	47
19	0	0	0	0	2	4	3	5	4	4	2	0	24
20	0	0	0	0	1	2	7	4	2	2	0	0	18
21	0	0	0	0	2	0	2	7	2	3	0	0	16
22	0	0	0	0	1	3	1	0	1	0	1	0	7
23	0	0	0	0	0	0	0	1	4	0	0	0	5
24	0	0	0	0	1	1	0	0	1	0	0	0	3
7-19	0	1	4	4	28	72	86	89	44	31	6	2	367
6-22	0	1	4	4	32	78	97	102	49	37	7	2	413
6-24	0	1	4	4	33	79	97	103	54	37	7	2	421
0-24	0	1	4	4	35	87	98	110	55	38	7	2	441

Direction : SOUTHBOUND

Sunday 15/03/2020	VEHICLE SPEED (MPH)												TOTAL
Hr Ending	0-10	11-20	21-30	31-35	36-40	41-45	46-50	51-55	56-60	61-70	71-80	81-120	
1	0	0	0	0	1	3	1	2	0	0	0	0	7
2	0	0	0	0	0	1	1	1	0	0	0	0	3
3	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	2	0	0	0	1	0	0	3
5	0	0	0	0	1	0	2	0	1	0	0	0	4
6	0	0	0	0	0	0	1	2	0	0	0	0	3
7	0	0	0	0	0	3	2	2	1	1	0	0	9
8	0	0	0	0	0	1	3	3	0	2	0	0	9
9	0	1	0	0	4	5	6	3	1	0	1	0	21
10	0	0	0	2	3	9	6	9	3	5	0	0	37
11	0	0	0	2	6	5	8	10	2	1	1	0	35
12	0	0	0	2	5	13	12	9	6	1	1	0	49
13	0	0	0	1	2	12	7	6	3	2	0	0	33
14	0	1	0	1	7	10	14	5	2	1	0	0	41
15	0	0	0	0	4	8	8	11	1	3	0	0	35
16	0	0	0	1	1	6	12	6	4	1	0	0	31
17	0	0	0	3	4	6	6	5	3	3	0	0	30
18	1	0	0	0	1	4	7	7	3	0	0	0	23
19	0	0	0	0	2	6	4	7	7	1	0	1	28
20	0	0	0	1	2	3	2	3	1	2	0	0	14
21	0	0	0	0	2	3	4	3	0	0	1	0	13
22	0	0	0	0	0	5	0	1	0	1	0	0	7
23	0	0	0	0	0	0	0	0	1	1	0	0	2
24	0	0	0	0	1	1	1	0	1	0	0	0	4
7-19	1	2	0	12	39	85	93	81	35	20	3	1	372
6-22	1	2	0	13	43	99	101	90	37	24	4	1	415
6-24	1	2	0	13	44	100	102	90	39	25	4	1	421
0-24	1	2	0	13	46	106	107	95	40	26	4	1	441

Automatic Classified Counts, Parsonby

LOCATION: B5301

Direction : NORTHBOUND

Monday 16/03/2020	VEHICLE SPEED (MPH)												TOTAL
Hr Ending	0-10	11-20	21-30	31-35	36-40	41-45	46-50	51-55	56-60	61-70	71-80	81-120	
1	0	0	0	0	0	0	1	0	0	0	0	0	1
2	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	1	0	0	0	0	1
6	0	0	0	0	2	1	3	3	0	2	0	0	11
7	0	0	0	0	0	2	3	0	2	4	1	1	13
8	0	0	0	0	5	5	8	11	10	8	0	0	47
9	0	0	2	2	6	10	13	12	5	5	1	0	56
10	0	0	0	1	2	5	9	7	2	4	0	0	30
11	0	0	0	1	5	12	9	3	1	3	0	0	34
12	0	0	2	1	10	10	12	7	4	3	0	0	49
13	0	0	0	1	5	13	14	13	2	2	0	0	50
14	0	0	3	2	1	4	12	7	1	2	0	0	32
15	0	0	0	0	2	15	13	15	4	2	0	0	51
16	0	0	0	1	2	4	10	18	16	4	1	0	56
17	0	0	0	2	5	13	15	22	14	11	0	0	82
18	0	0	0	4	3	7	19	24	15	10	1	0	83
19	0	0	0	3	4	7	11	6	4	1	0	0	36
20	0	0	0	0	1	6	3	4	1	1	0	0	16
21	0	0	0	1	0	7	3	0	1	2	0	0	14
22	0	0	0	0	1	2	0	3	1	1	0	0	8
23	0	0	0	0	0	0	2	0	1	0	0	0	3
24	0	0	0	0	0	0	2	0	0	0	0	0	2
7-19	0	0	7	18	50	105	145	145	78	55	3	0	606
6-22	0	0	7	19	52	122	154	152	83	63	4	1	657
6-24	0	0	7	19	52	122	158	152	84	63	4	1	662
0-24	0	0	7	19	54	123	162	156	84	65	4	1	675

Direction : SOUTHBOUND

Monday 16/03/2020	VEHICLE SPEED (MPH)												TOTAL
Hr Ending	0-10	11-20	21-30	31-35	36-40	41-45	46-50	51-55	56-60	61-70	71-80	81-120	
1	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	1	0	0	0	0	0	0	0	1
3	0	0	0	0	0	0	0	0	0	1	0	0	1
4	0	0	0	0	0	0	0	0	0	0	1	0	1
5	0	0	0	0	0	1	3	1	2	2	0	0	9
6	0	0	0	0	1	2	4	3	0	1	1	0	12
7	0	0	1	0	2	7	2	8	6	4	0	0	30
8	0	0	3	2	9	12	19	22	6	7	2	0	82
9	0	0	7	7	5	19	32	15	8	3	0	0	96
10	0	0	1	1	5	14	21	12	2	4	1	0	61
11	0	0	0	1	9	10	14	8	1	4	0	0	47
12	0	0	5	4	11	14	7	8	0	1	0	0	50
13	0	0	4	2	13	8	8	4	1	1	0	0	41
14	0	0	9	1	12	10	7	2	0	4	0	0	45
15	0	0	1	2	2	8	19	5	0	1	0	0	38
16	0	0	3	3	2	7	13	11	0	1	0	0	40
17	0	0	2	3	5	7	15	12	4	6	0	0	54
18	0	0	2	1	3	8	11	11	2	2	1	0	41
19	0	0	0	2	1	7	8	6	3	3	0	0	30
20	0	0	0	0	4	5	3	0	0	0	0	0	12
21	0	0	0	1	2	2	1	0	0	1	0	0	7
22	0	0	1	1	2	2	0	1	0	1	0	0	8
23	0	0	0	0	1	2	1	0	0	2	0	0	6
24	0	0	0	0	0	0	0	0	0	0	0	0	0
7-19	0	0	37	29	77	124	174	116	27	37	4	0	625
6-22	0	0	39	31	87	140	180	125	33	43	4	0	682
6-24	0	0	39	31	88	142	181	125	33	45	4	0	688
0-24	0	0	39	31	90	145	188	129	35	49	6	0	712

Automatic Classified Counts, Parsonby

LOCATION: B5301

Direction : NORTHBOUND

Tuesday 17/03/2020	VEHICLE SPEED (MPH)												TOTAL
Hr Ending	0-10	11-20	21-30	31-35	36-40	41-45	46-50	51-55	56-60	61-70	71-80	81-120	
1	0	0	0	0	1	0	1	0	0	0	0	0	2
2	0	0	0	0	2	1	0	0	1	0	0	0	4
3	0	0	0	0	1	0	1	0	0	0	0	0	2
4	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	3	1	3	3	0	0	0	10
7	0	0	0	0	0	8	6	3	2	2	0	0	21
8	0	0	0	0	0	2	10	4	8	12	1	0	37
9	0	0	0	0	4	2	11	18	6	2	2	0	45
10	0	0	0	0	1	10	12	8	11	2	0	1	45
11	0	0	0	1	1	11	12	6	8	2	0	0	41
12	0	0	0	0	1	2	11	8	2	2	0	0	26
13	0	0	0	1	1	6	7	14	6	2	0	0	37
14	0	0	0	0	1	9	7	6	6	3	0	0	32
15	0	0	0	0	3	11	15	17	16	4	1	0	67
16	0	0	0	1	3	9	11	22	7	6	1	0	60
17	0	0	2	2	5	11	18	14	12	7	2	0	73
18	0	0	1	1	1	8	20	30	9	7	2	0	79
19	0	0	0	0	1	11	10	13	3	3	0	0	41
20	0	0	0	0	3	2	3	3	2	0	1	0	14
21	0	0	0	0	2	1	3	2	1	0	0	0	9
22	0	0	0	0	5	2	2	1	1	0	0	0	11
23	0	0	1	1	0	1	1	0	0	1	0	0	5
24	0	0	0	0	1	1	0	0	0	0	0	0	2
7-19	0	0	3	6	22	92	144	160	94	52	9	1	583
6-22	0	0	3	6	32	105	158	169	100	54	10	1	638
6-24	0	0	4	7	33	107	159	169	100	55	10	1	645
0-24	0	0	4	7	37	111	162	172	104	55	10	1	663

Direction : SOUTHBOUND

Tuesday 17/03/2020	VEHICLE SPEED (MPH)												TOTAL
Hr Ending	0-10	11-20	21-30	31-35	36-40	41-45	46-50	51-55	56-60	61-70	71-80	81-120	
1	0	0	0	0	0	2	0	0	0	0	0	0	2
2	0	0	0	0	0	2	0	0	0	1	0	0	3
3	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	1	0	0	0	1
5	0	0	0	0	1	0	0	4	1	0	1	0	7
6	0	0	0	0	0	2	4	3	0	1	0	0	10
7	0	0	0	0	4	7	15	14	4	1	0	0	45
8	0	0	2	1	4	7	23	17	8	1	4	0	67
9	0	0	3	0	6	21	20	24	4	6	1	0	85
10	0	0	0	1	1	12	15	11	4	6	0	0	50
11	0	0	1	4	11	13	11	5	5	0	1	0	51
12	0	1	5	0	4	14	12	6	3	1	0	0	46
13	0	0	0	0	4	20	13	7	4	2	1	0	51
14	0	0	2	8	4	10	9	5	2	0	0	0	40
15	0	0	0	1	5	20	15	12	8	0	0	0	61
16	0	1	0	5	8	10	10	5	5	0	0	0	44
17	0	1	3	1	5	4	17	7	3	6	1	0	48
18	0	0	0	2	2	17	14	6	1	1	0	0	43
19	0	0	0	2	4	2	8	3	2	1	0	0	22
20	0	0	0	0	1	5	2	0	1	1	0	0	10
21	0	0	1	2	2	2	0	1	0	1	0	0	9
22	0	0	0	0	2	4	2	0	0	0	1	0	9
23	0	0	0	0	0	0	0	1	1	1	1	0	4
24	0	0	0	0	0	2	0	0	0	1	0	0	3
7-19	0	3	16	25	58	150	167	108	49	24	8	0	608
6-22	0	3	17	27	67	168	186	123	54	27	9	0	681
6-24	0	3	17	27	67	170	186	124	55	29	10	0	688
0-24	0	3	17	27	68	176	190	131	57	31	11	0	711

Automatic Classified Counts, Parsonby

LOCATION: B5301

Direction : NORTHBOUND

Wednesday 18/03/2020	VEHICLE SPEED (MPH)							
Hr Ending	0-10	11-20	21-30	31-35	36-40	41-45	46-50	51-55
1	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0
6	0	0	0	0	0	1	5	2
7	0	0	0	1	0	2	2	3
8	0	0	0	0	3	8	7	10
9	0	0	0	0	6	8	10	10
10	0	0	0	1	3	5	10	6
11	0	1	0	2	4	8	15	6
12	0	0	1	4	9	9	11	5
13	0	0	0	2	3	4	8	9
14	0	0	0	2	3	14	9	13
15	0	1	2	2	8	12	19	12
16	0	0	0	0	1	21	13	17
17	0	0	0	0	5	11	15	23
18	0	0	0	1	1	9	17	18
19	0	0	1	1	2	13	9	11
20	0	0	0	3	6	3	5	6
21	0	0	0	0	0	2	6	5
22	0	0	0	0	0	4	1	2
23	0	0	0	0	0	0	3	2
24	0	0	0	0	0	1	0	0
7-19	0	2	4	15	48	122	143	140
6-22	0	2	4	19	54	133	157	156
6-24	0	2	4	19	54	134	160	158
0-24	0	2	4	19	54	135	165	160

Direction : SOUTHBOUND

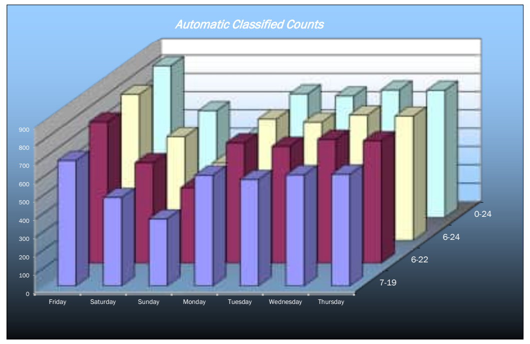
Wednesday 18/03/2020	VEHICLE SPEED (MPH)							
Hr Ending	0-10	11-20	21-30	31-35	36-40	41-45	46-50	51-55
1	0	0	0	0	1	1	0	0
2	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	1	0
4	0	0	0	0	0	1	0	1
5	0	0	0	0	0	1	0	2
6	0	0	0	0	1	3	2	1
7	0	0	0	1	0	11	14	7
8	0	0	1	0	1	7	33	18
9	0	0	8	1	7	22	19	15
10	0	3	6	4	10	9	10	5
11	0	0	2	1	9	9	12	9
12	0	0	8	5	18	14	6	6
13	0	0	1	3	12	4	2	3
14	0	0	6	4	5	20	7	5
15	0	0	2	7	3	13	10	9
16	0	0	0	0	6	6	14	8
17	0	0	0	1	4	13	20	7
18	0	0	0	1	1	5	12	11
19	0	0	2	2	3	5	5	3
20	0	0	0	0	0	2	4	1
21	0	0	4	0	0	1	1	2
22	0	0	0	1	1	2	0	0
23	0	0	0	0	0	0	0	1
24	0	0	0	0	0	1	0	0
7-19	0	3	36	29	79	127	150	99
6-22	0	3	40	31	80	143	169	109
6-24	0	3	40	31	80	144	169	110
0-24	0	3	40	31	82	150	172	114

Automatic Classified Counts, Parsonby

LOCATION: B5301

Direction : NORTHBOUND

VEHICLE FLOWS									
Hr Ending	Friday 13-Mar-20	Saturday 14-Mar-20	Sunday 15-Mar-20	Monday 16-Mar-20	Tuesday 17-Mar-20	Wednesday 18-Mar-20	Thursday 19-Mar-20	WEEKDAY AVERAGE	WEEK AVERAGE
1	3	6	4	1	2	2	1	2	3
2	2	2	2	0	4	0	3	2	2
3	3	3	6	0	2	0	1	1	2
4	1	0	2	0	0	0	1	0	1
5	3	1	1	1	0	0	1	1	1
6	20	5	5	11	10	10	10	12	10
7	14	8	5	13	21	14	17	16	13
8	30	6	6	47	37	48	39	40	30
9	53	27	7	56	45	45	49	50	40
10	39	19	17	30	45	34	30	36	31
11	53	45	13	34	41	42	41	42	38
12	63	37	42	49	26	42	49	46	44
13	45	44	50	50	37	39	37	42	43
14	63	48	42	32	32	42	42	42	43
15	65	86	42	51	67	60	55	60	61
16	79	48	43	56	60	62	60	63	58
17	88	49	34	82	73	75	77	79	68
18	72	50	47	83	79	72	86	78	70
19	35	26	24	36	41	47	46	41	36
20	38	27	18	16	14	25	21	23	23
21	18	17	16	14	9	19	11	14	15
22	16	11	7	8	11	10	8	11	10
23	15	10	5	3	5	7	6	7	7
24	11	8	3	2	2	1	4	4	4
7-19	685	485	367	606	583	608	611	619	564
6-22	771	548	413	657	638	676	668	682	624
6-24	797	566	421	662	645	684	678	693	636
0-24	829	583	441	675	663	696	695	712	655



Automatic Classified Counts, Parsonby

LOCATION: B5301

Direction : NORTHBOUND

AVERAGE SPEEDS							
Hr Ending	Friday 13-Mar-20	Saturday 14-Mar-20	Sunday 15-Mar-20	Monday 16-Mar-20	Tuesday 17-Mar-20	Wednesday 18-Mar-20	Thursday 19-Mar-20
1	51.3	52.2	49.3	48.0	43.0	61.8	58.0
2	40.5	56.8	53.0	-	44.3	-	48.0
3	43.0	48.0	42.2	-	43.0	-	33.0
4	43.0	-	61.8	-	-	-	38.0
5	40.5	65.5	53.0	53.0	-	-	43.0
6	51.5	63.0	46.0	50.3	51.0	50.5	48.0
7	49.3	65.2	52.5	60.3	49.4	53.9	52.0
8	52.6	52.6	52.2	52.7	56.9	53.2	50.9
9	49.6	50.3	60.9	48.7	52.2	50.4	50.1
10	47.6	50.9	48.1	50.2	51.9	49.9	49.2
11	48.9	47.5	51.5	46.6	49.6	46.8	50.3
12	48.8	51.0	50.3	46.3	50.9	44.3	48.3
13	49.4	51.9	50.3	47.8	51.0	52.3	48.1
14	51.3	51.3	50.1	46.5	50.7	46.7	48.8
15	48.8	50.9	49.3	49.1	51.8	46.1	47.5
16	48.9	51.9	50.5	53.2	51.7	49.5	47.5
17	51.2	51.7	50.0	51.6	50.6	52.1	52.1
18	52.5	52.2	48.7	52.2	52.2	53.3	52.6
19	50.1	48.6	54.3	47.1	50.0	49.4	51.0
20	51.0	45.3	51.1	48.5	49.6	45.2	48.8
21	51.6	48.4	53.5	47.6	47.4	53.9	48.9
22	49.9	44.6	49.8	50.8	43.9	53.3	45.5
23	49.8	44.5	57.0	51.3	43.0	52.3	48.0
24	47.3	44.6	46.3	48.0	40.5	43.0	43.0
10-12	48.8	49.2	50.9	46.5	50.2	45.5	49.3
14-16	48.9	51.4	49.9	51.2	51.8	47.8	47.5
0-24	48.7	51.7	51.3	50.0	48.8	50.4	47.9

85TH PERCENTILE							
Hr Ending	Friday 13-Mar-20	Saturday 14-Mar-20	Sunday 15-Mar-20	Monday 16-Mar-20	Tuesday 17-Mar-20	Wednesday 18-Mar-20	Thursday 19-Mar-20
1	59.0	55.9	54.0	-	50.1	67.1	-
2	44.0	69.1	53.0	-	53.7	-	53.0
3	43.0	53.0	44.2	-	50.1	-	-
4	-	-	67.1	-	-	-	-
5	54.4	-	-	-	-	-	-
6	59.7	85.4	52.7	59.5	57.3	55.4	54.7
7	59.3	82.9	60.9	76.2	56.7	64.8	60.2
8	59.9	60.7	55.9	61.2	65.2	61.9	59.8
9	56.2	58.6	73.9	58.6	60.2	59.1	57.3
10	54.2	60.6	54.7	58.5	61.9	57.7	57.0
11	57.4	56.3	59.9	54.5	56.8	55.0	59.3
12	59.8	59.4	59.2	55.3	57.0	52.3	56.6
13	57.7	58.6	60.0	54.5	57.9	63.9	55.6
14	58.0	60.3	58.0	56.3	58.3	52.6	57.3
15	55.9	59.5	56.1	55.2	59.2	55.4	54.6
16	58.6	59.0	58.8	60.6	59.7	55.9	57.3
17	59.7	59.2	62.3	59.9	60.4	60.3	60.6
18	59.8	59.1	59.8	60.6	60.2	61.5	59.2
19	59.2	57.0	64.9	54.8	56.6	58.1	57.6
20	62.6	52.9	58.3	55.6	59.8	53.1	56.2
21	58.2	56.6	61.7	56.9	54.3	61.9	53.8
22	60.0	53.0	62.8	59.8	50.9	65.0	53.1
23	57.9	51.6	59.2	57.1	58.3	56.8	57.5
24	56.4	55.5	56.7	48.0	44.0	-	50.1
10-12	58.6	57.9	59.6	54.9	56.9	53.6	57.9
14-16	57.3	59.2	57.4	57.9	59.5	55.7	55.9
0-24	57.0	60.2	58.9	58.1	56.7	58.8	56.5

7 DAY AVERAGE SPEED	49.8
7 DAY AVERAGE 85th PERCENTILE	58.0

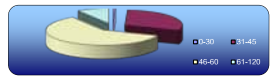
Automatic Classified Counts, Parsonby

LOCATION: B5301

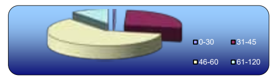
Direction : NORTHBOUND

SPEED SUMMARY							
SPEED (MPH)	Friday 13-Mar-20	Saturday 14-Mar-20	Sunday 15-Mar-20	Monday 16-Mar-20	Tuesday 17-Mar-20	Wednesday 18-Mar-20	Thursday 19-Mar-20
0-30	6	4	5	7	4	6	6
31-45	249	161	126	196	155	208	200
46-60	500	357	263	402	438	420	437
61-120	74	61	47	70	66	62	52
TOTAL	829	583	441	675	663	696	695

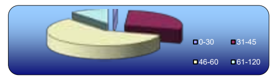
Friday 13-Mar-20



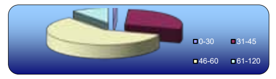
Saturday 14-Mar-20



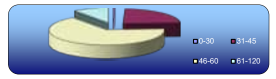
Sunday 15-Mar-20



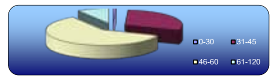
Monday 16-Mar-20



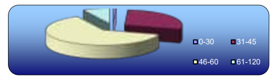
Tuesday 17-Mar-20



Wednesday 18-Mar-20



Thursday 19-Mar-20

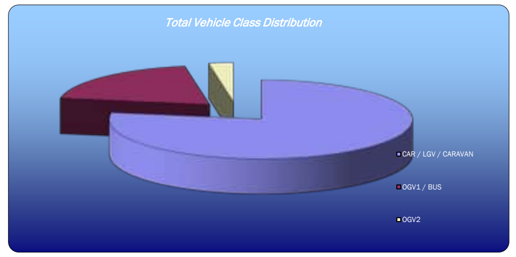


Automatic Classified Counts, Parsonby

LOCATION: B5301

Direction : NORTHBOUND

VEHICLE CLASSIFICATION				
	CAR / LGV / CARAVAN	OGV1 / BUS	OGV2	TOTAL
13-Mar-20				
7-19	541	126	18	685
6-22	616	136	19	771
6-24	642	136	19	797
0-24	670	139	20	829
14-Mar-20				
7-19	408	73	4	485
6-22	460	83	5	548
6-24	478	83	5	566
0-24	493	85	5	583
15-Mar-20				
7-19	307	58	2	367
6-22	350	61	2	413
6-24	358	61	2	421
0-24	377	62	2	441
16-Mar-20				
7-19	465	127	14	606
6-22	507	136	14	657
6-24	510	138	14	662
0-24	519	142	14	675
17-Mar-20				
7-19	443	125	15	583
6-22	489	133	16	638
6-24	495	133	17	645
0-24	511	135	17	663
18-Mar-20				
7-19	443	137	28	608
6-22	505	143	28	676
6-24	513	143	28	684
0-24	523	144	29	696
19-Mar-20				
7-19	457	131	23	611
6-22	507	138	23	668
6-24	516	139	23	678
0-24	528	144	23	695
AVERAGE				
7-19	438	111	15	564
6-22	491	119	15	624
6-24	502	119	15	636
0-24	517	122	16	655

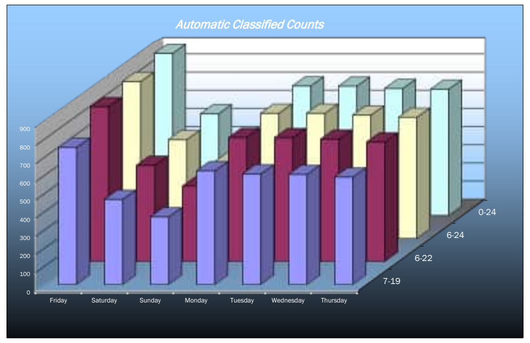


Automatic Classified Counts, Parsonby

LOCATION: B5301

Direction : SOUTHBOUND

SOUTHBOUND									
Hr Ending	Friday 13-Mar-20	Saturday 14-Mar-20	Sunday 15-Mar-20	Monday 16-Mar-20	Tuesday 17-Mar-20	Wednesday 18-Mar-20	Thursday 19-Mar-20	WEEKDAY AVERAGE	WEEK AVERAGE
1	4	2	7	0	2	3	2	2	3
2	2	3	3	1	3	1	3	2	2
3	2	1	0	1	0	1	0	1	1
4	1	0	3	1	1	2	1	1	1
5	7	6	4	9	7	5	8	7	7
6	12	4	3	12	10	8	14	11	9
7	43	20	9	30	45	43	41	40	33
8	83	22	9	82	67	73	79	77	59
9	95	37	21	96	85	86	77	88	71
10	63	48	37	61	50	53	55	56	52
11	66	52	35	47	51	46	42	50	48
12	59	46	49	50	46	57	36	50	49
13	66	30	33	41	51	30	61	50	45
14	49	46	41	45	40	50	36	44	44
15	67	44	35	38	61	47	54	53	49
16	55	34	31	40	44	40	41	44	41
17	48	38	30	54	48	59	48	51	46
18	47	42	23	41	43	36	40	41	39
19	56	29	28	30	22	28	22	32	31
20	22	23	14	12	10	10	13	13	15
21	15	8	13	7	9	9	8	10	10
22	17	10	7	8	9	6	4	9	9
23	8	8	2	6	4	3	5	5	5
24	4	6	4	0	3	2	4	3	3
7-19	754	468	372	625	608	605	591	637	575
6-22	851	529	415	682	681	673	657	709	641
6-24	863	543	421	688	688	678	666	717	650
0-24	891	559	441	712	711	698	694	741	672



Automatic Classified Counts, Parsonby

LOCATION: B5301

Direction : SOUTHBOUND

AVERAGE SPEEDS							
Hr Ending	Friday 13-Mar-20	Saturday 14-Mar-20	Sunday 15-Mar-20	Monday 16-Mar-20	Tuesday 17-Mar-20	Wednesday 18-Mar-20	Thursday 19-Mar-20
1	45.5	50.5	45.9	-	43.0	46.3	53.0
2	45.5	53.8	48.0	38.0	50.5	58.0	43.0
3	45.5	65.5	-	65.5	-	48.0	-
4	58.0	-	50.5	75.5	58.0	48.0	53.0
5	56.2	58.0	48.0	54.1	54.8	53.0	66.4
6	50.7	54.3	51.3	51.3	50.3	47.7	48.2
7	49.7	51.0	50.5	51.1	49.2	50.6	50.4
8	48.2	51.0	53.0	49.2	50.4	51.1	47.6
9	47.9	47.5	45.9	45.9	48.7	46.7	45.8
10	44.3	48.6	49.6	48.3	50.3	41.6	45.7
11	42.7	45.8	48.0	47.3	45.0	45.8	42.7
12	45.6	46.7	48.1	42.1	44.1	39.7	46.3
13	46.5	49.3	48.0	42.1	48.0	44.6	44.0
14	47.7	46.9	45.4	41.2	42.8	42.9	45.1
15	45.8	48.2	49.1	46.2	47.6	44.5	46.0
16	45.5	46.2	49.0	45.6	44.3	48.6	47.4
17	46.2	46.3	47.8	48.6	48.3	50.8	53.9
18	49.2	48.2	47.7	48.2	46.2	50.4	47.1
19	46.7	46.6	52.5	49.3	46.8	47.6	52.2
20	51.3	43.0	48.7	42.6	47.3	50.5	50.3
21	46.7	47.1	48.6	44.1	41.3	40.5	52.1
22	50.6	49.3	47.6	42.4	46.6	46.8	49.9
23	52.4	42.4	61.8	50.5	63.0	58.8	51.0
24	43.0	50.5	46.8	-	50.5	54.3	48.0
10-12	44.2	46.2	48.1	44.7	44.6	42.7	44.5
14-16	45.6	47.2	49.1	45.9	45.9	46.6	46.7
0-24	48.0	49.4	49.2	48.6	48.6	48.2	49.1

85TH PERCENTILE							
Hr Ending	Friday 13-Mar-20	Saturday 14-Mar-20	Sunday 15-Mar-20	Monday 16-Mar-20	Tuesday 17-Mar-20	Wednesday 18-Mar-20	Thursday 19-Mar-20
1	55.9	54.0	51.5	-	43.0	56.7	60.1
2	49.0	65.1	53.0	-	63.5	-	48.0
3	49.0	-	-	-	-	-	-
4	-	-	63.5	-	-	55.1	-
5	76.3	70.5	56.2	62.2	65.8	59.1	81.0
6	63.6	67.2	54.2	61.6	56.8	56.2	55.1
7	57.2	56.0	58.2	60.6	55.1	58.5	56.8
8	58.0	60.3	60.8	59.1	59.9	58.9	56.6
9	55.6	59.5	56.8	55.0	57.3	56.8	55.9
10	54.0	59.5	58.6	56.5	58.0	53.5	54.3
11	50.6	55.2	56.9	55.2	53.6	53.9	52.8
12	54.1	51.8	56.2	50.7	54.0	47.6	53.9
13	54.6	61.3	55.5	50.8	55.5	56.3	51.4
14	56.5	54.9	53.5	52.3	51.0	53.1	54.9
15	55.2	58.0	56.5	52.9	53.8	53.1	53.9
16	53.2	56.6	55.6	54.3	53.0	55.7	55.7
17	55.6	51.4	57.2	58.2	60.0	61.7	62.2
18	57.8	55.3	58.3	57.6	52.2	57.5	55.3
19	53.7	52.6	64.2	57.7	55.1	58.7	63.2
20	60.8	51.8	58.6	46.5	55.6	56.4	59.1
21	51.1	54.8	58.2	54.7	53.3	55.9	60.9
22	59.8	56.0	56.4	54.7	58.0	59.2	60.6
23	62.4	51.4	67.1	62.5	72.8	65.1	55.5
24	47.1	56.6	55.3	-	63.5	70.2	48.0
10-12	52.3	53.5	56.6	52.9	53.8	50.7	53.3
14-16	54.2	57.3	56.0	53.6	53.4	54.4	54.8
0-24	56.1	57.3	57.5	55.9	56.8	57.2	57.1

7 DAY AVERAGE SPEED	48.7
7 DAY AVERAGE 85th PERCENTILE	56.9

Automatic Classified Counts, Parsonby

LOCATION: B5301

Direction : SOUTHBOUND

SPEED SUMMARY							
SPEED (MPH)	Friday 13-Mar-20	Saturday 14-Mar-20	Sunday 15-Mar-20	Monday 16-Mar-20	Tuesday 17-Mar-20	Wednesday 18-Mar-20	Thursday 19-Mar-20
0-30	30	11	3	39	20	43	29
31-45	358	229	165	266	271	263	242
46-60	460	292	242	352	378	342	378
61-120	43	27	31	55	42	50	45
TOTAL	891	559	441	712	711	698	694

Friday 13-Mar-20

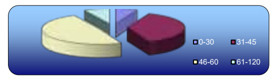
Saturday 14-Mar-20

Sunday 15-Mar-20

Monday 16-Mar-20

Tuesday 17-Mar-20

Wednesday 18-Mar-20



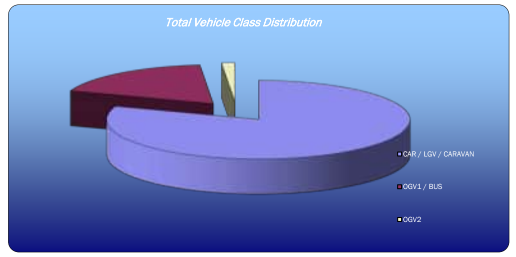
Thursday 19-Mar-20

Automatic Classified Counts, Parsonby

LOCATION: B5301

Direction : SOUTHBOUND

VEHICLE CLASSIFICATION				
	CAR / LGV / CARAVAN	OGV1 / BUS	OGV2	TOTAL
13-Mar-20				
7-19	608	135	11	754
6-22	694	146	11	851
6-24	704	148	11	863
0-24	728	151	12	891
14-Mar-20				
7-19	405	60	3	468
6-22	462	64	3	529
6-24	476	64	3	543
0-24	491	65	3	559
15-Mar-20				
7-19	319	51	2	372
6-22	355	58	2	415
6-24	360	58	3	421
0-24	376	62	3	441
16-Mar-20				
7-19	498	122	5	625
6-22	544	132	6	682
6-24	550	132	6	688
0-24	571	135	6	712
17-Mar-20				
7-19	467	131	10	608
6-22	528	143	10	681
6-24	535	143	10	688
0-24	555	146	10	711
18-Mar-20				
7-19	480	112	13	605
6-22	540	120	13	673
6-24	544	121	13	678
0-24	562	122	14	698
19-Mar-20				
7-19	459	119	13	591
6-22	515	129	13	657
6-24	523	130	13	666
0-24	548	133	13	694
AVERAGE				
7-19	462	104	8	575
6-22	520	113	8	641
6-24	527	114	8	650
0-24	547	116	9	672



Automatic Classified Counts

LOCATION: PARSONBY BROW

Direction : NORTHBOUND

Saturday 08/02/2020	VEHICLE CLASSIFICATION													TOTAL
Hr Ending	1	2	3	4	5	6	7	8	9	10	11	12	13	
1	3	0	0	0	0	0	0	0	0	0	0	0	0	3
2	7	0	0	0	0	0	0	0	0	0	0	0	0	7
3	4	0	0	0	0	0	0	0	0	0	0	0	0	4
4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	1	1	0	0	0	0	0	0	0	0	0	0	0	2
6	5	0	0	0	0	0	0	0	0	0	0	0	0	5
7	6	1	0	0	0	0	0	0	0	0	0	0	0	7
8	5	1	0	0	1	0	0	0	0	0	0	0	0	7
9	9	3	1	0	0	0	0	0	0	0	0	0	0	13
10	25	6	1	0	1	0	0	0	0	0	0	0	0	33
11	30	4	0	0	0	0	0	0	0	0	0	1	0	35
12	43	7	0	0	0	0	0	0	1	0	0	0	0	51
13	53	5	0	0	0	0	0	0	0	0	0	0	0	58
14	55	2	0	0	1	0	0	0	0	0	0	0	0	58
15	47	4	0	0	0	0	0	0	1	0	0	0	0	52
16	41	8	0	0	0	0	0	0	0	0	0	0	0	49
17	44	0	0	0	0	0	0	0	0	0	0	0	0	44
18	35	5	0	0	0	0	0	0	0	0	0	1	0	41
19	22	2	0	0	1	0	0	0	0	0	0	0	0	25
20	16	0	0	0	0	0	0	0	0	0	0	0	0	16
21	17	3	0	0	0	0	0	0	0	0	0	0	0	20
22	22	1	0	0	0	0	0	0	0	0	0	0	0	23
23	9	1	0	0	0	0	0	0	0	0	0	0	0	10
24	9	1	0	0	0	0	0	0	0	0	0	0	0	10
7-19	409	47	2	0	4	0	0	0	2	0	0	2	0	466
6-22	470	52	2	0	4	0	0	0	2	0	0	2	0	532
6-24	488	54	2	0	4	0	0	0	2	0	0	2	0	552
0-24	508	55	2	0	4	0	0	0	2	0	0	2	0	573

Direction : SOUTHBOUND

Saturday 08/02/2020	VEHICLE CLASSIFICATION													TOTAL
Hr Ending	1	2	3	4	5	6	7	8	9	10	11	12	13	
1	1	0	0	0	0	0	0	0	0	0	0	0	0	1
2	2	1	0	0	0	0	0	0	0	0	0	0	0	3
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	2	0	0	0	0	0	0	0	0	0	0	0	0	2
5	3	0	0	0	0	0	0	0	0	0	0	0	0	3
6	9	0	0	0	0	0	0	0	0	0	0	0	0	9
7	11	0	0	0	0	0	0	0	0	0	0	0	0	11
8	23	0	0	0	0	0	0	0	0	0	0	0	0	23
9	36	5	0	0	0	0	0	0	0	0	0	0	0	41
10	49	5	0	0	0	0	0	0	0	0	0	0	0	54
11	46	6	0	0	0	0	0	0	0	0	0	0	0	52
12	50	6	0	0	1	0	0	0	0	0	0	0	0	57
13	44	1	0	0	1	0	0	0	0	0	0	0	0	46
14	44	6	0	0	0	0	0	0	0	0	0	0	0	50
15	28	2	0	0	0	0	0	0	0	0	0	0	0	30
16	43	2	0	0	0	0	0	0	1	0	0	0	0	46
17	25	5	0	0	0	0	0	0	0	0	0	0	0	30
18	26	7	0	0	0	0	0	0	0	0	0	0	0	33
19	25	1	0	0	0	0	0	0	0	0	0	0	0	26
20	17	0	0	0	0	0	0	0	0	0	0	1	0	18
21	13	0	0	0	0	0	0	0	0	0	0	0	0	13
22	21	1	0	0	0	0	0	0	0	0	0	1	0	23
23	7	1	0	0	0	0	0	0	0	0	0	0	0	8
24	8	0	0	0	0	0	0	0	0	0	0	0	0	8
7-19	439	46	0	0	2	0	0	0	1	0	0	0	0	488
6-22	501	47	0	0	2	0	0	0	1	0	0	2	0	553
6-24	516	48	0	0	2	0	0	0	1	0	0	2	0	569
0-24	533	49	0	0	2	0	0	0	1	0	0	2	0	587

Automatic Classified Counts

LOCATION: PARSONBY BROW

Direction : NORTHBOUND

Sunday 09/02/2020	VEHICLE CLASSIFICATION													TOTAL
Hr Ending	1	2	3	4	5	6	7	8	9	10	11	12	13	
1	5	1	0	0	0	0	0	0	0	0	0	0	0	6
2	0	0	0	0	1	0	0	0	0	0	0	0	0	1
3	2	0	0	0	0	0	0	0	0	0	0	0	0	2
4	1	0	0	0	0	0	0	0	0	0	0	0	0	1
5	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	7	0	0	0	0	0	0	0	0	0	0	0	0	7
7	7	0	0	0	0	0	0	0	0	0	1	0	0	8
8	1	2	0	0	0	0	0	0	1	0	0	0	0	4
9	3	0	0	0	0	0	0	0	0	0	0	0	0	3
10	7	2	0	0	0	0	0	0	0	0	0	0	0	9
11	18	3	0	0	0	0	0	0	0	0	0	0	0	21
12	10	2	0	0	0	0	0	0	0	0	0	0	0	12
13	19	2	0	0	0	0	0	0	0	0	1	0	0	22
14	21	4	0	0	0	0	0	0	0	0	0	0	0	25
15	21	8	0	0	0	0	0	0	0	0	0	0	0	29
16	14	4	0	0	0	0	0	0	0	0	0	0	0	18
17	20	6	0	0	1	0	0	0	0	0	0	0	0	27
18	9	2	0	0	0	0	0	0	0	0	0	1	0	12
19	17	2	0	0	0	0	0	0	0	0	0	0	0	19
20	15	1	0	0	0	0	0	0	0	0	0	0	0	16
21	10	5	0	0	0	0	0	0	0	0	0	0	0	15
22	7	0	0	0	0	0	0	0	0	0	0	0	0	7
23	5	1	0	0	0	0	0	0	0	0	0	0	0	6
24	5	0	0	0	0	0	0	0	0	0	0	0	0	5
7-19	160	37	0	0	1	0	0	0	1	0	1	1	0	201
6-22	199	43	0	0	1	0	0	0	1	0	2	1	0	247
6-24	209	44	0	0	1	0	0	0	1	0	2	1	0	258
0-24	224	45	0	0	2	0	0	0	1	0	2	1	0	275

Direction : SOUTHBOUND

Sunday 09/02/2020	VEHICLE CLASSIFICATION													TOTAL
Hr Ending	1	2	3	4	5	6	7	8	9	10	11	12	13	
1	2	1	0	0	0	0	0	0	0	0	0	0	0	3
2	3	1	0	0	0	0	0	0	0	0	0	0	0	4
3	1	0	0	0	0	0	0	0	0	0	0	0	0	1
4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	2	0	0	0	0	0	0	0	0	0	0	0	0	2
6	7	0	0	0	0	0	0	0	0	0	0	0	0	7
7	5	0	0	0	0	0	0	0	0	0	0	0	0	5
8	2	1	0	0	0	0	0	0	0	0	0	0	0	3
9	9	0	0	0	0	0	0	0	0	0	0	0	0	9
10	7	0	0	0	0	0	0	0	0	0	0	0	0	7
11	9	2	0	0	0	0	0	0	0	0	0	0	0	11
12	20	2	0	0	0	0	0	0	0	0	0	0	0	22
13	18	3	0	0	0	0	0	0	0	0	0	0	0	21
14	17	2	0	0	0	0	0	0	0	0	0	0	0	19
15	14	2	0	0	0	0	0	0	0	0	0	0	0	16
16	13	2	0	0	0	0	0	0	0	0	0	0	0	15
17	19	2	0	0	0	0	0	0	0	0	0	0	0	21
18	8	0	0	0	0	0	0	0	0	0	0	0	0	8
19	20	0	0	0	0	0	0	0	0	0	0	0	0	20
20	12	1	0	0	0	0	0	0	0	0	0	0	0	13
21	9	0	0	0	0	0	0	0	0	0	0	0	0	9
22	4	0	0	0	0	0	0	0	0	0	0	0	0	4
23	3	1	0	0	0	0	0	0	0	0	0	0	0	4
24	3	0	0	0	0	0	0	0	0	0	0	0	0	3
7-19	156	16	0	0	0	0	0	0	0	0	0	0	0	172
6-22	186	17	0	0	0	0	0	0	0	0	0	0	0	203
6-24	192	18	0	0	0	0	0	0	0	0	0	0	0	210
0-24	207	20	0	0	0	0	0	0	0	0	0	0	0	227

Automatic Classified Counts

LOCATION: PARSONBY BROW

Direction : NORTHBOUND

Monday 10/02/2020	VEHICLE CLASSIFICATION													TOTAL
Hr Ending	1	2	3	4	5	6	7	8	9	10	11	12	13	
1	1	0	0	0	0	0	0	0	0	0	0	0	0	1
2	1	0	0	0	0	0	0	0	0	0	0	0	0	1
3	3	0	0	0	0	0	0	0	0	0	0	0	0	3
4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	1	1	0	0	0	0	0	0	0	0	0	1	0	3
6	6	1	0	0	0	0	0	0	0	0	0	0	0	7
7	16	0	0	0	0	0	0	0	0	0	0	0	0	16
8	29	5	1	0	0	0	0	1	2	0	0	1	0	39
9	41	8	0	0	0	0	0	0	1	0	0	0	0	50
10	27	13	0	0	1	0	0	0	1	0	0	1	0	43
11	21	5	0	0	0	0	0	0	1	0	0	0	0	27
12	36	6	0	0	2	0	0	0	1	0	0	0	0	45
13	35	5	1	0	0	0	0	0	0	0	1	0	0	42
14	35	7	0	0	1	0	0	0	0	0	2	0	0	45
15	37	9	0	0	2	0	0	0	0	0	1	0	0	49
16	55	5	0	0	0	0	0	0	0	0	0	3	0	63
17	67	11	0	0	1	0	0	0	1	0	0	1	0	81
18	88	10	0	0	0	0	0	0	0	0	0	0	0	98
19	36	5	0	0	0	0	0	0	0	0	0	0	0	41
20	14	5	0	0	0	0	0	0	0	0	0	0	0	19
21	21	5	0	0	0	0	0	0	0	0	0	0	0	26
22	15	1	0	0	0	0	0	0	0	0	0	0	0	16
23	8	2	0	0	0	0	0	0	0	0	0	0	0	10
24	7	0	0	0	0	0	0	0	0	0	0	0	0	7
7-19	507	89	2	0	7	0	0	1	7	0	4	6	0	623
6-22	573	100	2	0	7	0	0	1	7	0	4	6	0	700
6-24	588	102	2	0	7	0	0	1	7	0	4	6	0	717
0-24	600	104	2	0	7	0	0	1	7	0	4	7	0	732

Direction : SOUTHBOUND

Monday 10/02/2020	VEHICLE CLASSIFICATION													TOTAL
Hr Ending	1	2	3	4	5	6	7	8	9	10	11	12	13	
1	3	0	0	0	0	0	0	0	0	0	0	0	0	3
2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	3	0	0	0	0	0	0	0	0	0	0	0	0	3
4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	4	0	0	0	0	0	0	0	0	0	0	0	0	4
6	14	2	0	0	0	0	0	0	0	0	0	0	0	16
7	27	2	0	0	0	0	0	0	0	0	0	0	0	29
8	86	4	1	0	0	0	0	0	1	0	0	1	0	93
9	85	10	0	0	0	0	0	0	0	0	0	0	0	95
10	43	2	0	0	1	0	0	0	0	0	0	0	0	46
11	49	10	0	0	1	0	0	0	0	0	0	0	0	60
12	35	7	0	0	0	0	0	0	0	0	0	2	0	44
13	41	3	1	0	0	0	0	0	0	0	0	1	0	46
14	44	3	0	0	1	0	0	0	0	0	0	0	0	48
15	43	2	0	0	2	0	0	0	2	0	0	1	0	50
16	51	3	0	0	0	0	0	0	0	0	0	0	0	54
17	68	3	0	0	1	0	0	0	0	0	0	1	0	73
18	53	3	0	0	0	0	0	0	1	0	0	0	0	57
19	32	1	0	0	0	0	0	0	0	0	0	0	0	33
20	12	1	0	0	0	0	0	0	0	0	0	0	0	13
21	12	0	0	0	0	0	0	0	0	0	0	0	0	12
22	12	1	0	0	0	0	0	0	0	0	0	0	0	13
23	8	0	0	0	0	0	0	0	0	0	0	0	0	8
24	4	0	0	0	0	0	0	0	0	0	0	0	0	4
7-19	630	51	2	0	6	0	0	0	4	0	0	6	0	699
6-22	693	55	2	0	6	0	0	0	4	0	0	6	0	766
6-24	705	55	2	0	6	0	0	0	4	0	0	6	0	778
0-24	729	57	2	0	6	0	0	0	4	0	0	6	0	804

Automatic Classified Counts

LOCATION: PARSONBY BROW

Direction : NORTHBOUND

Tuesday 11/02/2020	VEHICLE CLASSIFICATION													TOTAL
Hr Ending	1	2	3	4	5	6	7	8	9	10	11	12	13	
1	1	0	0	0	0	0	0	0	0	0	0	0	0	1
2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	2	0	0	0	0	0	0	0	0	0	0	1	0	3
6	9	0	0	0	0	0	0	0	1	0	0	0	0	10
7	10	3	0	0	0	0	0	0	0	0	0	0	0	13
8	42	6	0	1	0	0	0	0	1	0	1	0	0	51
9	57	2	1	0	0	0	0	0	2	0	0	0	0	62
10	31	3	0	0	0	0	0	0	1	0	1	0	0	36
11	17	5	1	0	0	0	0	0	1	0	0	0	0	24
12	35	7	0	0	0	0	0	0	1	0	3	1	0	47
13	35	4	0	0	0	0	0	0	0	0	0	0	0	39
14	33	6	0	0	0	0	0	0	0	0	0	0	0	39
15	63	1	0	0	1	0	0	0	0	0	3	0	0	68
16	60	9	0	0	0	0	0	0	0	0	0	1	0	70
17	68	12	0	0	1	0	0	0	0	0	0	0	0	81
18	76	6	0	0	1	0	0	0	0	0	0	1	0	84
19	60	3	0	0	0	0	0	0	0	0	0	0	0	63
20	27	3	0	0	0	0	0	0	0	0	0	0	0	30
21	14	2	0	0	0	0	0	0	0	0	0	0	0	16
22	18	1	0	0	0	0	0	0	0	0	0	0	0	19
23	13	1	0	0	0	0	0	0	0	1	0	0	0	15
24	7	0	0	0	0	0	0	0	1	0	0	0	0	8
7-19	577	64	2	1	3	0	0	0	6	0	8	3	0	664
6-22	646	73	2	1	3	0	0	0	6	0	8	3	0	742
6-24	666	74	2	1	3	0	0	0	7	1	8	3	0	765
0-24	678	74	2	1	3	0	0	0	8	1	8	4	0	779

Direction : SOUTHBOUND

Tuesday 11/02/2020	VEHICLE CLASSIFICATION													TOTAL
Hr Ending	1	2	3	4	5	6	7	8	9	10	11	12	13	
1	1	0	0	0	0	0	0	0	0	0	0	0	0	1
2	2	1	0	0	0	0	0	0	0	0	0	0	0	3
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	1	0	0	0	0	0	0	0	0	0	0	0	0	1
5	3	0	0	0	0	0	0	0	0	0	0	0	0	3
6	13	1	0	0	0	0	0	0	0	0	0	0	0	14
7	37	2	0	0	0	0	0	0	0	0	0	0	0	39
8	79	9	0	0	1	0	0	0	1	0	0	0	0	90
9	89	10	0	0	0	0	0	0	0	0	0	1	0	100
10	45	4	1	0	0	0	0	0	0	0	0	0	0	50
11	42	4	0	0	0	0	0	0	0	0	0	0	0	46
12	32	7	0	0	0	0	0	0	3	0	0	0	0	42
13	41	7	0	0	0	0	0	0	0	0	0	0	0	48
14	42	3	0	0	0	0	0	0	0	0	0	0	0	45
15	38	5	0	0	1	0	0	0	0	0	0	0	0	44
16	59	4	0	0	0	0	0	0	1	0	0	0	0	64
17	85	1	0	0	0	0	0	0	0	0	0	0	0	86
18	55	1	0	0	0	0	0	0	0	0	0	0	0	56
19	49	2	0	0	0	0	0	0	0	0	0	0	0	51
20	20	1	0	0	0	0	0	0	0	0	0	1	0	22
21	10	1	0	0	0	0	0	0	0	0	0	0	0	11
22	15	2	0	0	0	0	0	0	0	0	0	0	0	17
23	9	0	0	0	0	0	0	0	0	0	0	0	0	9
24	4	0	0	0	0	0	0	0	0	0	0	1	0	5
7-19	656	57	1	0	2	0	0	0	5	0	0	1	0	722
6-22	738	63	1	0	2	0	0	0	5	0	0	2	0	811
6-24	751	63	1	0	2	0	0	0	5	0	0	3	0	825
0-24	771	65	1	0	2	0	0	0	5	0	0	3	0	847

Automatic Classified Counts

LOCATION: PARSONBY BROW

Direction : NORTHBOUND

Wednesday 12/02/2020	VEHICLE CLASSIFICATION													TOTAL
Hr Ending	1	2	3	4	5	6	7	8	9	10	11	12	13	
1	2	0	0	0	0	0	0	0	0	0	0	0	0	2
2	1	0	0	0	0	0	0	0	1	0	0	0	0	2
3	1	0	0	0	0	0	0	0	0	0	0	0	0	1
4	1	0	0	0	0	0	0	0	0	0	0	0	0	1
5	0	0	0	0	0	0	0	0	0	0	0	1	0	1
6	12	1	0	0	0	0	0	0	0	0	0	0	0	13
7	16	2	0	0	0	0	1	0	0	0	1	0	0	20
8	43	6	0	0	0	0	0	0	0	0	0	1	0	50
9	39	9	0	0	1	0	0	0	1	0	1	1	0	52
10	29	5	0	0	0	0	0	0	0	0	2	1	0	37
11	32	12	0	0	0	0	0	0	1	0	1	2	0	48
12	35	6	0	0	0	0	0	0	1	0	2	0	0	44
13	26	9	0	0	0	0	0	0	2	0	2	0	0	39
14	42	5	0	0	1	0	0	0	1	0	2	0	0	51
15	55	6	1	0	1	0	0	0	1	0	1	0	0	65
16	58	10	0	0	2	0	1	0	1	0	1	0	0	73
17	80	19	0	0	0	0	0	0	1	0	0	0	0	100
18	80	12	0	0	0	0	0	0	1	0	0	0	0	93
19	41	9	0	0	0	0	0	0	0	1	0	0	0	51
20	23	5	0	0	0	0	0	0	0	0	1	0	0	29
21	27	1	0	0	0	0	0	0	0	0	0	0	0	28
22	17	0	0	0	0	0	0	0	0	0	0	0	0	17
23	11	2	1	0	0	0	0	0	0	0	0	0	0	14
24	5	0	0	0	0	0	0	0	0	0	0	0	0	5
7-19	560	108	1	0	5	0	1	0	10	1	12	5	0	703
6-22	643	116	1	0	5	0	2	0	10	1	14	5	0	797
6-24	659	118	2	0	5	0	2	0	10	1	14	5	0	816
0-24	676	119	2	0	5	0	2	0	11	1	14	6	0	836

Direction : SOUTHBOUND

Wednesday 12/02/2020	VEHICLE CLASSIFICATION													TOTAL
Hr Ending	1	2	3	4	5	6	7	8	9	10	11	12	13	
1	3	2	0	0	0	0	0	0	0	0	0	0	0	5
2	1	0	0	0	0	0	0	0	0	0	0	0	0	1
3	2	0	0	0	0	0	0	0	0	0	0	0	0	2
4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	4	0	0	0	0	0	0	0	0	0	0	0	0	4
6	10	0	0	0	0	0	0	0	0	0	0	0	0	10
7	41	5	0	0	0	0	0	0	1	0	0	0	0	47
8	72	7	0	0	0	0	0	0	0	0	0	0	0	79
9	79	9	0	0	0	0	0	0	0	0	0	1	0	89
10	58	6	0	0	1	0	0	0	2	0	0	0	0	67
11	42	6	0	0	0	0	0	0	2	0	0	0	0	50
12	46	6	0	0	1	0	0	0	1	0	0	2	0	56
13	43	5	1	0	0	0	0	1	1	0	0	0	0	51
14	43	4	0	0	4	0	0	0	0	0	0	0	0	51
15	58	8	1	0	1	0	0	0	0	0	0	0	0	68
16	53	6	0	0	1	0	0	0	1	0	0	0	0	61
17	60	5	0	0	0	0	1	0	0	0	0	0	0	66
18	36	3	0	0	0	0	0	0	0	0	0	0	0	39
19	32	3	0	0	0	0	0	0	0	0	0	0	0	35
20	31	1	0	0	0	0	0	0	0	0	0	0	0	32
21	13	0	0	0	0	0	0	0	0	0	0	0	0	13
22	11	2	0	0	0	0	0	0	0	0	0	0	0	13
23	8	0	0	0	0	0	0	0	0	0	0	0	0	8
24	4	0	0	0	0	0	0	0	0	0	0	0	0	4
7-19	622	68	2	0	8	0	1	1	7	0	0	3	0	712
6-22	718	76	2	0	8	0	1	1	8	0	0	3	0	817
6-24	730	76	2	0	8	0	1	1	8	0	0	3	0	829
0-24	750	78	2	0	8	0	1	1	8	0	0	3	0	851

Automatic Classified Counts

LOCATION: PARSONBY BROW

Direction : NORTHBOUND

Thursday 13/02/2020	VEHICLE CLASSIFICATION							
Hr Ending	1	2	3	4	5	6	7	8
1	3	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0
4	1	0	0	0	0	0	0	0
5	1	1	0	0	0	0	0	0
6	10	3	0	0	0	0	0	0
7	16	2	0	0	0	0	0	0
8	44	10	0	0	0	0	0	0
9	51	10	1	0	0	0	0	1
10	29	10	0	1	1	0	0	0
11	29	7	0	0	6	0	0	0
12	33	7	0	0	0	0	0	0
13	30	5	0	0	2	0	0	0
14	42	6	1	0	0	0	0	0
15	35	9	0	0	1	0	0	0
16	52	9	0	0	0	0	0	0
17	63	21	0	0	2	0	0	0
18	81	16	0	0	0	0	0	0
19	39	10	0	0	0	0	0	0
20	23	3	0	0	0	0	0	0
21	21	0	0	0	0	0	0	0
22	12	1	0	0	0	0	0	0
23	17	1	0	0	0	0	0	0
24	7	1	0	0	0	0	0	0
7-19	528	120	2	1	12	0	0	1
6-22	600	126	2	1	12	0	0	1
6-24	624	128	2	1	12	0	0	1
0-24	639	132	2	1	12	0	0	1

Direction : SOUTHBOUND

Thursday 13/02/2020	VEHICLE CLASSIFICATION							
Hr Ending	1	2	3	4	5	6	7	8
1	1	0	0	0	0	0	0	0
2	2	0	0	0	0	0	0	0
3	5	0	0	0	0	0	0	0
4	0	2	0	0	0	0	0	0
5	4	1	0	0	0	0	0	0
6	19	1	0	0	0	0	0	0
7	35	1	0	0	0	0	0	0
8	93	9	1	0	0	0	0	0
9	87	7	0	0	0	0	0	0
10	52	7	0	0	0	0	1	1
11	54	7	0	0	0	0	0	0
12	45	11	1	0	4	0	0	0
13	42	6	0	0	1	0	0	0
14	29	5	1	0	1	0	0	0
15	50	3	0	0	1	0	0	0
16	51	7	0	0	0	0	0	0
17	52	8	0	0	1	0	0	0
18	56	4	0	0	0	0	0	0
19	31	1	0	0	0	0	0	0
20	25	0	0	0	0	0	0	0
21	21	0	0	0	0	0	0	0
22	14	0	0	0	0	0	0	0
23	13	1	0	0	0	0	0	0
24	5	0	0	0	0	0	0	0
7-19	642	75	3	0	8	0	1	1
6-22	737	76	3	0	8	0	1	1
6-24	755	77	3	0	8	0	1	1
0-24	786	81	3	0	8	0	1	1

Automatic Classified Counts

LOCATION: PARSONBY BROW

Direction : NORTHBOUND

Saturday 08/02/2020	VEHICLE SPEED (MPH)												TOTAL
Hr Ending	0-10	11-20	21-30	31-35	36-40	41-45	46-50	51-55	56-60	61-70	71-80	81-120	
1	0	0	0	0	0	0	0	2	1	0	0	0	3
2	0	0	0	0	0	0	0	4	1	1	0	1	7
3	0	0	0	1	0	2	0	0	0	1	0	0	4
4	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	1	0	0	1	0	0	0	2
6	0	0	0	0	0	0	1	1	2	1	0	0	5
7	0	0	0	0	1	0	2	0	2	2	0	0	7
8	0	0	0	0	0	3	2	2	0	0	0	0	7
9	0	0	0	0	1	1	3	3	2	2	1	0	13
10	0	0	0	0	1	1	12	6	5	8	0	0	33
11	0	0	1	0	6	8	7	8	1	4	0	0	35
12	0	0	1	0	0	5	7	11	13	14	0	0	51
13	0	0	0	0	2	6	10	18	11	8	1	2	58
14	0	0	1	1	2	11	9	14	10	8	1	1	58
15	0	0	0	0	1	6	12	13	9	9	1	1	52
16	0	0	0	0	0	8	12	10	7	10	2	0	49
17	0	0	0	1	0	4	13	9	9	3	4	1	44
18	0	0	0	2	1	4	11	14	6	2	1	0	41
19	0	0	4	2	3	1	6	7	0	1	0	1	25
20	0	0	1	0	6	3	3	2	0	1	0	0	16
21	0	0	0	1	5	3	6	4	1	0	0	0	20
22	0	0	1	1	4	5	6	4	1	1	0	0	23
23	0	0	1	0	1	3	2	2	0	1	0	0	10
24	0	0	0	0	1	2	6	0	1	0	0	0	10
7-19	0	0	7	6	17	58	104	115	73	69	11	6	466
6-22	0	0	9	8	33	69	121	125	77	73	11	6	532
6-24	0	0	10	8	35	74	129	127	78	74	11	6	552
0-24	0	0	10	9	35	77	130	134	83	77	11	7	573

Direction : SOUTHBOUND

Saturday 08/02/2020	VEHICLE SPEED (MPH)												TOTAL
Hr Ending	0-10	11-20	21-30	31-35	36-40	41-45	46-50	51-55	56-60	61-70	71-80	81-120	
1	0	0	0	0	0	0	1	0	0	0	0	0	1
2	0	0	1	0	0	0	2	0	0	0	0	0	3
3	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	1	0	1	0	0	2
5	0	0	0	0	0	0	0	1	1	0	1	0	3
6	0	0	0	0	1	2	5	1	0	0	0	0	9
7	0	0	0	0	0	2	5	3	1	0	0	0	11
8	0	0	0	0	0	6	5	7	3	1	1	0	23
9	0	0	0	0	3	9	12	5	9	3	0	0	41
10	0	0	2	0	5	12	9	13	8	4	0	1	54
11	0	0	1	0	7	8	17	9	6	3	1	0	52
12	0	0	1	5	7	12	18	9	2	3	0	0	57
13	1	1	0	1	6	13	10	5	6	1	2	0	46
14	1	0	0	0	3	11	17	12	4	1	1	0	50
15	0	0	0	0	3	11	5	7	4	0	0	0	30
16	0	0	0	2	9	12	11	6	4	2	0	0	46
17	0	0	0	0	0	9	11	7	1	2	0	0	30
18	0	0	1	1	4	12	7	5	1	2	0	0	33
19	0	0	0	1	8	5	4	4	2	2	0	0	26
20	0	0	2	2	4	3	4	2	1	0	0	0	18
21	0	0	1	0	2	3	3	2	2	0	0	0	13
22	0	0	4	4	6	7	1	0	0	1	0	0	23
23	0	0	1	1	1	3	2	0	0	0	0	0	8
24	0	0	0	0	2	3	2	1	0	0	0	0	8
7-19	2	1	5	10	55	120	126	89	50	24	5	1	488
6-22	2	1	12	16	67	135	139	96	54	25	5	1	553
6-24	2	1	13	17	70	141	143	97	54	25	5	1	569
0-24	2	1	14	17	71	143	151	100	55	26	6	1	587

Automatic Classified Counts

LOCATION: PARSONBY BROW

Direction : NORTHBOUND

Sunday 09/02/2020	VEHICLE SPEED (MPH)												TOTAL
Hr Ending	0-10	11-20	21-30	31-35	36-40	41-45	46-50	51-55	56-60	61-70	71-80	81-120	
1	0	0	0	1	1	3	1	0	0	0	0	0	6
2	0	0	0	0	0	0	0	0	1	0	0	0	1
3	0	0	0	0	0	1	1	0	0	0	0	0	2
4	0	0	0	0	0	0	0	0	0	1	0	0	1
5	0	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	4	0	2	1	0	0	0	7
7	0	0	0	1	1	2	1	0	0	3	0	0	8
8	0	0	0	0	1	0	0	2	1	0	0	0	4
9	0	0	0	1	0	0	0	0	1	0	1	0	3
10	0	0	0	0	0	0	3	3	2	1	0	0	9
11	0	0	0	1	1	5	5	5	3	1	0	0	21
12	0	1	0	0	0	3	2	3	2	1	0	0	12
13	0	0	0	0	2	2	4	7	3	3	1	0	22
14	0	0	1	0	0	2	8	9	3	1	0	1	25
15	0	0	0	0	0	1	14	7	5	2	0	0	29
16	0	0	0	2	0	4	5	3	2	2	0	0	18
17	0	0	0	0	0	4	4	11	4	4	0	0	27
18	0	0	0	0	0	2	4	3	1	1	1	0	12
19	0	0	0	1	1	3	5	3	3	3	0	0	19
20	0	0	0	0	0	3	4	8	1	0	0	0	16
21	0	0	0	0	5	0	4	1	1	4	0	0	15
22	0	0	0	0	0	0	2	0	4	1	0	0	7
23	0	0	0	0	0	1	2	1	1	1	0	0	6
24	0	0	0	0	2	1	1	0	0	0	1	0	5
7-19	0	1	1	5	5	26	54	56	30	19	3	1	201
6-22	0	1	1	6	11	31	65	65	36	27	3	1	247
6-24	0	1	1	6	13	33	68	66	37	28	4	1	258
0-24	0	1	1	7	14	41	70	68	39	29	4	1	275

Direction : SOUTHBOUND

Sunday 09/02/2020	VEHICLE SPEED (MPH)												TOTAL
Hr Ending	0-10	11-20	21-30	31-35	36-40	41-45	46-50	51-55	56-60	61-70	71-80	81-120	
1	0	0	0	0	2	0	1	0	0	0	0	0	3
2	0	0	0	0	0	2	2	0	0	0	0	0	4
3	0	0	0	0	0	0	0	1	0	0	0	0	1
4	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	1	0	0	0	1	0	0	0	2
6	0	0	0	0	1	1	2	2	1	0	0	0	7
7	0	0	0	0	1	3	1	0	0	0	0	0	5
8	0	0	0	0	1	1	0	1	0	0	0	0	3
9	0	0	0	1	4	3	0	0	1	0	0	0	9
10	0	0	0	1	1	0	3	2	0	0	0	0	7
11	0	0	0	2	0	4	3	1	0	1	0	0	11
12	0	0	0	5	3	4	5	4	1	0	0	0	22
13	0	0	0	2	5	7	4	0	1	2	0	0	21
14	0	0	0	2	0	8	7	2	0	0	0	0	19
15	0	0	0	1	0	4	5	5	0	1	0	0	16
16	0	0	0	0	5	4	4	0	1	1	0	0	15
17	0	0	0	0	3	6	3	4	3	2	0	0	21
18	0	0	0	0	0	3	2	1	1	0	1	0	8
19	0	0	0	0	1	5	10	3	1	0	0	0	20
20	0	0	0	0	0	2	5	3	1	1	0	1	13
21	0	0	0	0	1	3	5	0	0	0	0	0	9
22	0	0	0	0	0	1	0	1	1	1	0	0	4
23	0	0	0	0	0	0	0	1	2	1	0	0	4
24	0	0	0	0	1	0	2	0	0	0	0	0	3
7-19	0	0	0	14	23	49	46	23	9	7	1	0	172
6-22	0	0	0	14	25	58	57	27	11	9	1	1	203
6-24	0	0	0	14	26	58	59	28	13	10	1	1	210
0-24	0	0	0	14	30	61	64	31	15	10	1	1	227

Automatic Classified Counts

LOCATION: PARSONBY BROW

Direction : NORTHBOUND

Monday 10/02/2020	VEHICLE SPEED (MPH)												TOTAL
Hr Ending	0-10	11-20	21-30	31-35	36-40	41-45	46-50	51-55	56-60	61-70	71-80	81-120	
1	0	0	0	0	0	0	0	1	0	0	0	0	1
2	0	0	0	0	0	1	0	0	0	0	0	0	1
3	0	0	0	0	0	0	3	0	0	0	0	0	3
4	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	3	0	0	0	0	3
6	0	0	0	0	0	1	0	3	2	0	1	0	7
7	0	0	0	0	1	5	0	6	3	1	0	0	16
8	0	0	0	2	2	7	10	9	7	2	0	0	39
9	0	0	0	0	0	4	22	11	8	3	2	0	50
10	0	0	0	0	1	9	14	13	4	1	1	0	43
11	0	0	0	1	2	3	3	11	6	1	0	0	27
12	0	0	0	0	3	7	10	12	5	7	0	1	45
13	0	0	0	1	1	9	9	16	4	2	0	0	42
14	0	0	1	1	5	7	5	9	11	4	2	0	45
15	0	1	0	0	2	7	10	12	9	7	0	1	49
16	0	0	0	0	1	7	15	15	12	12	1	0	63
17	0	0	3	0	4	8	16	17	19	10	4	0	81
18	0	0	0	0	9	8	14	37	18	11	1	0	98
19	0	0	0	1	3	10	9	8	7	1	1	1	41
20	0	0	0	0	2	5	3	2	2	5	0	0	19
21	0	0	0	0	3	6	4	7	3	3	0	0	26
22	0	0	0	0	1	2	2	4	3	4	0	0	16
23	0	0	0	0	1	0	2	5	1	1	0	0	10
24	0	0	0	0	0	1	3	3	0	0	0	0	7
7-19	0	1	4	6	33	86	137	170	110	61	12	3	623
6-22	0	1	4	6	40	104	146	189	122	73	12	3	700
6-24	0	1	4	6	41	105	151	197	123	74	12	3	717
0-24	0	1	4	6	41	107	154	204	125	74	13	3	732

Direction : SOUTHBOUND

Monday 10/02/2020	VEHICLE SPEED (MPH)												TOTAL
Hr Ending	0-10	11-20	21-30	31-35	36-40	41-45	46-50	51-55	56-60	61-70	71-80	81-120	
1	0	0	0	0	0	2	1	0	0	0	0	0	3
2	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	2	0	0	1	0	0	0	3
4	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	1	1	1	1	0	0	4
6	0	0	0	1	1	1	6	4	2	0	1	0	16
7	0	0	1	0	0	1	9	8	6	4	0	0	29
8	0	0	5	2	11	18	21	19	7	9	1	0	93
9	0	0	0	3	8	14	27	24	14	5	0	0	95
10	0	0	1	2	8	15	12	5	3	0	0	0	46
11	0	0	1	5	16	19	7	8	4	0	0	0	60
12	0	0	1	0	4	16	15	6	2	0	0	0	44
13	0	0	1	0	5	14	15	8	1	2	0	0	46
14	0	0	4	4	5	12	7	12	3	1	0	0	48
15	0	0	4	7	7	8	6	12	4	2	0	0	50
16	0	0	1	4	4	7	16	11	6	5	0	0	54
17	0	0	3	3	9	16	10	21	8	3	0	0	73
18	0	0	0	2	2	11	25	15	2	0	0	0	57
19	0	0	0	2	2	12	6	8	2	1	0	0	33
20	0	0	0	0	0	4	3	2	2	1	1	0	13
21	0	0	0	2	3	3	1	2	1	0	0	0	12
22	0	0	0	0	2	0	0	6	2	3	0	0	13
23	0	0	0	0	2	0	2	3	0	1	0	0	8
24	0	0	0	0	0	3	0	0	1	0	0	0	4
7-19	0	0	21	34	81	162	167	149	56	28	1	0	699
6-22	0	0	22	36	86	170	180	167	67	36	2	0	766
6-24	0	0	22	36	88	170	185	170	68	37	2	0	778
0-24	0	0	22	37	89	175	193	175	72	38	3	0	804

Automatic Classified Counts

LOCATION: PARSONBY BROW

Direction : NORTHBOUND

Tuesday 11/02/2020	VEHICLE SPEED (MPH)												TOTAL
Hr Ending	0-10	11-20	21-30	31-35	36-40	41-45	46-50	51-55	56-60	61-70	71-80	81-120	
1	0	0	0	0	0	0	1	0	0	0	0	0	1
2	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	1	1	0	1	0	0	0	3
6	0	0	0	0	0	1	2	6	1	0	0	0	10
7	0	0	0	0	0	2	6	0	2	3	0	0	13
8	0	0	0	0	2	21	5	14	6	3	0	0	51
9	0	0	0	0	3	8	15	26	5	4	0	1	62
10	0	0	0	0	3	3	11	12	6	1	0	0	36
11	0	0	0	0	2	8	6	3	4	1	0	0	24
12	0	0	0	2	3	9	14	11	5	2	1	0	47
13	0	0	0	3	2	4	15	12	2	1	0	0	39
14	0	0	0	0	0	8	7	11	10	2	1	0	39
15	0	0	3	6	5	11	18	17	7	1	0	0	68
16	0	0	3	7	14	7	21	10	6	2	0	0	70
17	0	0	0	0	3	13	19	20	15	6	5	0	81
18	0	0	0	0	6	15	14	27	15	7	0	0	84
19	0	0	0	0	7	8	18	17	5	7	1	0	63
20	0	0	0	1	0	0	8	16	3	2	0	0	30
21	0	0	0	0	2	3	3	4	1	2	0	1	16
22	0	0	0	0	0	4	6	3	4	1	1	0	19
23	0	0	0	0	1	2	4	2	3	2	1	0	15
24	0	0	0	0	1	3	0	2	0	1	1	0	8
7-19	0	0	6	18	50	115	163	180	86	37	8	1	664
6-22	0	0	6	19	52	124	186	203	96	45	9	2	742
6-24	0	0	6	19	54	129	190	207	99	48	11	2	765
0-24	0	0	6	19	54	131	194	213	101	48	11	2	779

Direction : SOUTHBOUND

Tuesday 11/02/2020	VEHICLE SPEED (MPH)												TOTAL
Hr Ending	0-10	11-20	21-30	31-35	36-40	41-45	46-50	51-55	56-60	61-70	71-80	81-120	
1	0	0	0	0	0	0	0	1	0	0	0	0	1
2	0	0	0	0	0	0	2	1	0	0	0	0	3
3	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	1	0	0	0	1
5	0	0	0	0	0	0	1	1	0	1	0	0	3
6	0	0	0	0	0	2	2	4	5	1	0	0	14
7	0	0	0	0	1	5	9	14	5	5	0	0	39
8	0	0	2	6	8	9	37	16	6	6	0	0	90
9	0	0	1	4	12	12	30	34	6	1	0	0	100
10	0	0	0	3	6	10	15	7	7	2	0	0	50
11	0	0	0	6	8	13	8	8	3	0	0	0	46
12	0	0	0	3	4	5	14	14	0	2	0	0	42
13	0	0	0	2	14	12	13	6	1	0	0	0	48
14	0	0	0	4	8	12	7	8	5	1	0	0	45
15	0	0	2	3	4	13	12	7	1	1	1	0	44
16	0	0	4	4	18	19	9	7	1	1	1	0	64
17	0	0	1	9	7	28	17	15	8	1	0	0	86
18	0	0	0	2	10	16	14	12	2	0	0	0	56
19	0	0	4	2	3	15	14	9	3	1	0	0	51
20	0	0	1	3	0	3	5	7	2	1	0	0	22
21	0	0	0	0	2	4	2	2	1	0	0	0	11
22	0	0	0	0	0	3	3	9	1	1	0	0	17
23	0	0	0	0	2	3	1	1	0	1	1	0	9
24	0	0	0	0	0	0	5	0	0	0	0	0	5
7-19	0	0	14	48	102	164	190	143	43	16	2	0	722
6-22	0	0	15	51	105	179	209	175	52	23	2	0	811
6-24	0	0	15	51	107	182	215	176	52	24	3	0	825
0-24	0	0	15	51	107	184	220	183	58	26	3	0	847

Automatic Classified Counts

LOCATION: PARSONBY BROW

Direction : NORTHBOUND

Wednesday 12/02/2020	VEHICLE SPEED (MPH)												TOTAL
Hr Ending	0-10	11-20	21-30	31-35	36-40	41-45	46-50	51-55	56-60	61-70	71-80	81-120	
1	0	0	0	0	0	0	2	0	0	0	0	0	2
2	0	0	0	0	0	2	0	0	0	0	0	0	2
3	0	0	0	0	0	0	0	0	0	1	0	0	1
4	0	0	0	0	0	0	1	0	0	0	0	0	1
5	0	0	0	0	0	0	0	1	0	0	0	0	1
6	0	0	0	1	2	2	0	5	1	2	0	0	13
7	0	0	0	1	1	1	9	3	0	3	2	0	20
8	0	0	0	1	3	10	11	16	2	7	0	0	50
9	0	0	0	1	3	8	14	13	7	6	0	0	52
10	0	0	0	0	1	6	15	8	6	1	0	0	37
11	0	0	0	2	8	17	5	9	3	3	1	0	48
12	0	3	0	1	2	7	10	15	4	2	0	0	44
13	0	0	3	2	2	6	8	10	7	1	0	0	39
14	0	0	3	3	2	11	15	7	5	4	1	0	51
15	0	0	0	2	6	12	12	16	10	4	3	0	65
16	0	0	0	0	8	13	15	19	11	7	0	0	73
17	0	0	0	0	1	7	28	37	14	12	1	0	100
18	0	0	0	0	4	19	13	18	21	16	2	0	93
19	0	0	0	0	3	5	18	6	4	12	3	0	51
20	0	0	1	0	0	6	11	7	1	3	0	0	29
21	0	0	0	0	2	7	4	7	4	4	0	0	28
22	0	0	0	0	3	3	3	6	1	1	0	0	17
23	0	0	0	0	1	0	5	2	2	2	2	0	14
24	0	0	0	0	0	1	0	3	0	1	0	0	5
7-19	0	3	6	12	43	121	164	174	94	75	11	0	703
6-22	0	3	7	13	49	138	191	197	100	86	13	0	797
6-24	0	3	7	13	50	139	196	202	102	89	15	0	816
0-24	0	3	7	14	52	143	199	208	103	92	15	0	836

Direction : SOUTHBOUND

Wednesday 12/02/2020	VEHICLE SPEED (MPH)												TOTAL
Hr Ending	0-10	11-20	21-30	31-35	36-40	41-45	46-50	51-55	56-60	61-70	71-80	81-120	
1	0	0	0	0	1	0	3	1	0	0	0	0	5
2	0	0	0	0	0	0	0	1	0	0	0	0	1
3	0	0	0	0	0	0	1	0	0	1	0	0	2
4	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	1	1	1	1	0	0	4
6	0	0	0	0	0	1	3	3	2	1	0	0	10
7	0	0	0	2	3	13	20	6	2	1	0	0	47
8	0	0	2	8	6	17	16	21	7	1	1	0	79
9	0	0	0	1	4	20	36	19	3	6	0	0	89
10	0	0	0	5	13	10	12	23	1	3	0	0	67
11	0	0	1	3	14	11	10	8	1	2	0	0	50
12	0	0	0	8	13	18	6	8	2	1	0	0	56
13	0	0	3	9	3	11	10	10	1	3	1	0	51
14	0	0	0	2	8	19	9	5	5	3	0	0	51
15	0	0	0	2	7	24	23	7	2	3	0	0	68
16	0	0	0	1	5	23	13	11	4	3	1	0	61
17	0	0	0	0	6	10	23	16	3	7	0	1	66
18	0	0	0	0	5	11	7	9	5	2	0	0	39
19	0	0	0	1	2	5	9	15	1	2	0	0	35
20	0	0	5	1	3	3	11	5	3	1	0	0	32
21	0	0	0	1	1	3	3	3	2	0	0	0	13
22	0	0	0	0	0	1	1	5	5	1	0	0	13
23	0	0	0	1	0	1	1	1	3	0	1	0	8
24	0	0	0	0	0	2	2	0	0	0	0	0	4
7-19	0	0	6	40	86	179	174	152	35	36	3	1	712
6-22	0	0	11	44	93	199	209	171	47	39	3	1	817
6-24	0	0	11	45	93	202	212	172	50	39	4	1	829
0-24	0	0	11	45	94	203	220	178	53	42	4	1	851

Automatic Classified Counts

LOCATION: PARSONBY BROW

Direction : NORTHBOUND

Thursday 13/02/2020	VEHICLE SPEED (MPH)							
Hr Ending	0-10	11-20	21-30	31-35	36-40	41-45	46-50	51-55
1	0	0	0	0	0	0	1	2
2	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	1	0
5	0	0	0	0	0	0	1	1
6	0	0	0	0	1	4	4	4
7	0	0	0	0	2	3	2	9
8	0	0	0	0	1	12	17	15
9	0	0	0	0	7	12	13	18
10	0	0	0	0	2	7	20	2
11	0	0	0	1	5	5	18	10
12	0	0	0	1	1	5	19	9
13	0	0	0	0	2	10	4	11
14	0	0	2	1	2	2	15	9
15	0	0	0	1	2	9	17	11
16	0	0	0	0	2	8	12	14
17	0	0	0	0	6	8	24	16
18	0	0	0	1	4	8	32	25
19	0	0	0	1	4	11	12	13
20	0	0	0	1	0	7	7	5
21	0	0	0	0	1	1	4	8
22	0	0	0	0	2	1	5	3
23	0	0	0	0	3	5	0	2
24	0	0	0	0	0	3	2	2
7-19	0	0	2	6	38	97	203	153
6-22	0	0	2	7	43	109	221	178
6-24	0	0	2	7	46	117	223	182
0-24	0	0	2	7	47	121	230	189

Direction : SOUTHBOUND

Thursday 13/02/2020	VEHICLE SPEED (MPH)							
Hr Ending	0-10	11-20	21-30	31-35	36-40	41-45	46-50	51-55
1	0	0	0	0	0	1	0	0
2	0	0	0	0	1	1	0	0
3	0	0	0	0	0	4	0	0
4	0	0	0	0	0	1	0	1
5	0	0	0	0	1	1	0	2
6	0	0	0	1	0	4	6	4
7	0	0	0	0	2	10	12	11
8	0	0	1	8	7	19	24	27
9	0	0	1	9	6	20	21	29
10	0	0	2	7	6	13	19	14
11	0	0	0	0	10	17	16	12
12	0	0	8	1	6	15	15	12
13	0	0	1	1	7	16	12	10
14	0	1	0	9	6	11	5	3
15	0	0	1	4	8	15	14	9
16	0	0	0	3	6	14	16	13
17	0	0	0	1	5	12	17	18
18	0	0	0	6	5	17	15	13
19	0	0	0	2	4	2	10	9
20	0	0	0	0	0	4	3	6
21	0	0	0	0	2	6	4	4
22	0	0	0	0	0	1	1	5
23	0	0	0	0	1	3	3	0
24	0	0	0	0	0	2	2	0
7-19	0	1	14	51	76	171	184	169
6-22	0	1	14	51	80	192	204	195
6-24	0	1	14	51	81	197	209	195
0-24	0	1	14	52	83	209	215	202

9	10	11	12	13	TOTAL
0	0	0	0	0	3
0	0	0	0	0	0
0	0	0	0	0	0
0	0	0	0	0	1
0	0	0	0	0	2
0	0	0	0	0	13
1	0	0	0	0	19
0	0	0	1	0	55
1	0	0	0	0	64
1	0	1	0	0	43
2	0	1	0	0	45
1	0	1	0	0	42
0	0	0	0	0	37
0	0	1	0	0	50
2	0	0	1	0	48
1	0	0	0	0	62
1	0	0	0	0	87
1	0	0	2	0	100
0	0	0	1	0	50
0	0	0	0	0	26
0	0	0	0	0	21
0	0	0	0	0	13
0	0	0	0	0	18
0	0	0	0	0	8
10	0	4	5	0	683
11	0	4	5	0	762
11	0	4	5	0	788
11	0	4	5	0	807

9	10	11	12	13	TOTAL
0	0	0	0	0	1
0	0	0	0	0	2
0	0	0	0	0	5
0	0	0	0	0	2
0	0	0	0	0	5
0	0	0	0	0	20
1	0	0	0	0	37
0	0	0	0	0	103
0	0	0	0	0	94
2	0	0	2	0	65
0	0	0	0	0	61
2	0	0	0	0	63
1	0	0	0	0	50
1	0	0	0	0	37
2	0	0	0	0	56
1	0	0	0	0	59
0	0	0	0	0	61
0	0	0	0	0	60
0	0	0	1	0	33
0	0	0	1	0	26
0	0	0	0	0	21
0	0	0	0	0	14
0	0	0	0	0	14
0	0	0	0	0	5
9	0	0	3	0	742
10	0	0	4	0	840
10	0	0	4	0	859
10	0	0	4	0	894

Automatic Classified Counts

LOCATION: PARSONBY BROW

Direction : NORTHBOUND

Friday 14/02/2020 Hr Ending	VEHICLE CLASSIFICATION 1	2	3	4	5	6	7	8	9	10	11	12	13	TOTAL
1	3	0	0	0	1	0	0	0	0	0	0	0	0	4
2	1	0	0	0	0	0	0	0	0	0	0	0	0	1
3	4	1	0	0	0	0	0	0	0	0	0	0	0	5
4	2	0	0	0	0	0	0	0	0	0	0	0	0	2
5	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	21	2	0	0	0	0	0	0	0	0	0	0	0	23
7	10	1	0	0	0	0	0	0	0	0	0	0	0	11
8	34	5	0	0	1	0	0	0	0	0	0	0	0	40
9	39	14	0	0	0	0	0	0	1	0	0	0	0	54
10	25	5	0	0	1	0	0	0	3	1	2	1	0	38
11	27	4	0	0	0	0	0	0	1	0	1	1	0	34
12	40	15	1	0	0	0	0	0	0	0	1	1	0	58
13	37	6	0	0	3	0	0	0	1	0	0	0	0	47
14	41	6	1	0	2	0	0	0	0	0	1	0	0	51
15	50	7	0	0	1	0	0	0	1	0	0	0	0	59
16	61	8	1	0	1	0	0	0	0	0	0	0	0	71
17	82	16	1	0	0	0	0	0	0	0	0	0	0	99
18	61	6	0	0	0	0	0	0	0	0	0	1	0	68
19	26	1	0	0	0	0	0	0	0	0	0	0	0	27
20	20	2	0	0	0	0	0	0	0	0	0	0	0	22
21	13	3	0	0	0	0	0	0	0	0	0	0	0	16
22	14	1	1	0	0	0	0	0	0	0	0	0	0	16
23	12	1	0	0	0	0	0	0	0	0	0	0	0	13
24	6	0	0	0	0	0	0	0	0	0	0	0	0	6
7-19	523	93	4	0	9	0	0	0	7	1	5	4	0	646
6-22	580	100	5	0	9	0	0	0	7	1	5	4	0	711
6-24	598	101	5	0	9	0	0	0	7	1	5	4	0	730
0-24	629	104	5	0	10	0	0	0	7	1	5	4	0	765

Direction : SOUTHBOUND

Friday 14/02/2020 Hr Ending	VEHICLE CLASSIFICATION 1	2	3	4	5	6	7	8	9	10	11	12	13	TOTAL
1	6	0	0	0	0	0	0	0	1	0	0	0	0	7
2	2	0	0	0	0	0	0	0	0	0	0	0	0	2
3	1	0	0	0	0	0	0	0	0	0	0	0	0	1
4	1	0	0	0	0	0	0	0	0	0	0	0	0	1
5	5	0	0	0	0	0	0	0	0	0	0	0	0	5
6	15	3	0	0	0	0	0	0	0	0	0	0	0	18
7	37	1	0	0	0	0	0	0	0	0	0	0	0	38
8	75	5	0	0	0	0	0	0	0	0	0	1	0	81
9	80	9	0	0	0	0	0	0	0	0	0	0	0	89
10	57	9	0	0	1	0	0	0	0	0	1	0	0	68
11	44	8	0	0	2	0	0	0	1	0	1	1	0	57
12	42	8	0	0	2	0	0	0	0	0	1	1	0	54
13	44	7	1	0	0	0	0	1	3	0	0	1	0	57
14	58	5	0	0	2	0	0	1	1	0	2	0	0	69
15	39	5	0	0	1	0	0	0	1	0	1	0	0	47
16	48	2	0	0	0	0	0	0	0	0	0	0	0	50
17	52	4	1	0	1	0	0	1	0	0	0	0	0	59
18	48	3	1	0	0	0	0	0	0	0	0	0	0	52
19	34	0	0	0	0	0	0	0	0	0	0	0	0	34
20	22	0	0	0	0	0	0	0	0	0	0	0	0	22
21	5	1	0	0	0	0	0	0	0	0	0	0	0	6
22	13	0	0	0	0	0	0	0	0	0	0	0	0	13
23	6	0	0	0	0	0	0	0	0	0	0	0	0	6
24	7	0	0	0	0	0	0	0	0	0	0	0	0	7
7-19	621	65	3	0	9	0	0	3	6	0	6	4	0	717
6-22	698	67	3	0	9	0	0	3	6	0	6	4	0	796
6-24	711	67	3	0	9	0	0	3	6	0	6	4	0	809
0-24	741	70	3	0	9	0	0	3	7	0	6	4	0	843

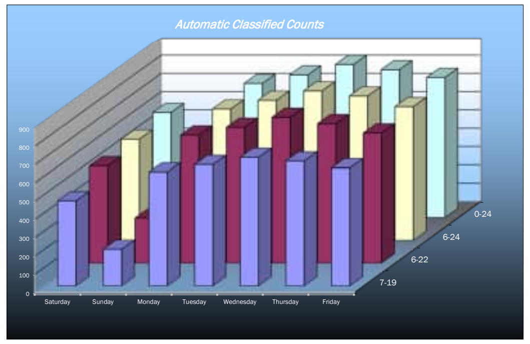
Automatic Classified Counts

LOCATION: PARSONBY BROW

Direction : NORTHBOUND

VEHICLE FLOWS

Hr Ending	Saturday 8-Feb-20	Sunday 9-Feb-20	Monday 10-Feb-20	Tuesday 11-Feb-20	Wednesday 12-Feb-20	Thursday 13-Feb-20	Friday 14-Feb-20	WEEKDAY AVERAGE	WEEK AVERAGE
1	3	6	1	1	2	3	4	2	3
2	7	1	1	0	2	0	1	1	2
3	4	2	3	0	1	0	5	2	2
4	0	1	0	0	1	1	2	1	1
5	2	0	3	3	1	2	0	2	2
6	5	7	7	10	13	13	23	13	11
7	7	8	16	13	20	19	11	16	13
8	7	4	39	51	50	55	40	47	35
9	13	3	50	62	52	64	54	56	43
10	33	9	43	36	37	43	38	39	34
11	35	21	27	24	48	45	34	36	33
12	51	12	45	47	44	42	58	47	43
13	58	22	42	39	39	37	47	41	41
14	58	25	45	39	51	50	51	47	46
15	52	29	49	68	65	48	59	58	53
16	49	18	63	70	73	62	71	68	58
17	44	27	81	81	100	87	99	90	74
18	41	12	98	84	93	100	68	89	71
19	25	19	41	63	51	50	27	46	39
20	16	16	19	30	29	26	22	25	23
21	20	15	26	16	28	21	16	21	20
22	23	7	16	19	17	13	16	16	16
23	10	6	10	15	14	18	13	14	12
24	10	5	7	8	5	8	6	7	7
7-19	466	201	623	664	703	683	646	664	569
6-22	532	247	700	742	797	762	711	742	642
6-24	552	258	717	765	816	788	730	763	661
0-24	573	275	732	779	836	807	765	784	681



Automatic Classified Counts

LOCATION: PARSONBY BROW

Direction : NORTHBOUND

AVERAGE SPEEDS

Hr Ending	Saturday 8-Feb-20	Sunday 9-Feb-20	Monday 10-Feb-20	Tuesday 11-Feb-20	Wednesday 12-Feb-20	Thursday 13-Feb-20	Friday 14-Feb-20
1	54.7	41.3	53.0	48.0	48.0	51.3	46.8
2	62.3	58.0	43.0	-	43.0	-	53.0
3	46.1	45.5	48.0	-	65.5	-	53.5
4	-	65.5	-	-	48.0	48.0	50.5
5	50.5	-	53.0	49.7	53.0	50.5	-
6	56.5	48.0	56.2	51.5	49.9	47.2	56.6
7	54.4	50.2	50.7	52.8	52.6	51.3	58.5
8	47.3	50.5	49.7	49.1	50.6	50.6	50.6
9	54.3	55.5	52.5	51.8	51.0	50.1	54.9
10	54.2	53.8	50.2	50.6	50.1	50.7	51.5
11	47.9	49.1	51.1	48.5	47.2	49.0	51.5
12	55.5	48.4	52.9	49.3	47.6	51.1	51.7
13	55.3	53.2	50.0	48.3	47.7	51.8	52.9
14	52.8	52.5	51.5	52.6	47.9	52.7	54.4
15	54.8	52.0	52.8	46.7	50.8	49.5	51.7
16	54.3	49.1	54.2	45.1	50.5	54.5	53.2
17	55.2	53.4	53.1	52.9	53.2	53.5	54.8
18	51.2	53.0	52.6	51.2	53.4	52.5	51.8
19	46.0	51.0	50.7	50.8	54.0	50.5	58.6
20	43.6	50.2	51.8	52.3	49.6	50.2	55.4
21	45.5	50.3	50.2	53.2	51.2	54.0	52.7
22	45.6	56.2	53.8	52.2	48.7	48.8	50.3
23	46.0	52.6	52.3	53.5	55.9	51.6	51.3
24	47.0	48.5	49.4	51.8	53.5	53.9	49.7
10-12	51.7	48.7	52.0	48.9	47.4	50.0	51.6
14-16	54.6	50.5	53.5	45.9	50.7	52.0	52.4
0-24	51.4	51.6	51.4	50.6	51.0	51.1	52.9

85TH PERCENTILE

Hr Ending	Saturday 8-Feb-20	Sunday 9-Feb-20	Monday 10-Feb-20	Tuesday 11-Feb-20	Wednesday 12-Feb-20	Thursday 13-Feb-20	Friday 14-Feb-20
1	57.6	46.5	-	-	48.0	54.2	54.3
2	79.8	-	-	-	43.0	-	-
3	59.9	49.0	48.0	-	-	-	61.5
4	-	-	-	-	-	-	61.1
5	61.1	-	53.0	57.3	-	54.0	-
6	63.0	54.5	66.1	55.6	60.2	52.2	64.2
7	64.6	63.6	58.3	61.3	63.9	59.5	75.1
8	51.8	59.2	57.4	56.2	58.6	57.3	57.7
9	64.5	76.9	59.8	60.6	58.8	57.7	66.9
10	62.0	59.7	56.9	56.8	55.9	58.5	60.7
11	57.1	56.7	58.5	55.7	56.2	56.6	60.2
12	64.0	60.9	63.7	57.5	58.5	61.3	60.7
13	66.8	62.5	56.6	55.2	57.4	60.7	63.9
14	64.0	64.8	62.1	59.9	58.2	63.0	64.0
15	65.0	57.5	64.4	55.3	60.3	56.0	62.3
16	63.2	58.2	62.1	54.1	58.3	64.5	60.6
17	66.9	60.2	63.4	61.8	59.8	63.3	63.7
18	59.2	62.5	60.4	58.5	62.2	61.1	60.5
19	61.7	60.2	62.1	59.0	64.1	61.1	69.2
20	52.7	54.6	61.9	58.1	57.5	58.3	67.4
21	52.3	61.6	58.5	68.3	59.6	61.4	61.5
22	54.2	62.5	62.1	60.7	56.3	55.2	56.5
23	56.5	60.7	59.3	63.6	67.0	62.1	58.3
24	52.2	64.2	53.2	64.7	61.5	73.2	56.5
10-12	60.5	58.8	61.1	56.6	57.4	58.9	60.5
14-16	64.1	57.9	63.2	54.7	59.3	60.3	61.4
0-24	60.9	59.8	59.4	59.0	58.4	59.6	62.1

7 DAY AVERAGE SPEED	51.4
7 DAY AVERAGE 85th PERCENTILE	59.9

Automatic Classified Counts

LOCATION: PARSONBY BROW

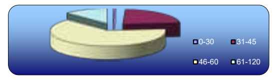
Direction : NORTHBOUND

SPEED SUMMARY

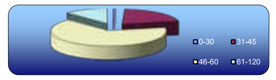
SPEED (MPH)	Saturday 8-Feb-20	Sunday 9-Feb-20	Monday 10-Feb-20	Tuesday 11-Feb-20	Wednesday 12-Feb-20	Thursday 13-Feb-20	Friday 14-Feb-20
0-30	10	2	5	6	10	2	4
31-45	121	62	154	204	209	175	142
46-60	347	177	483	508	510	535	496
61-120	95	34	90	61	107	95	123
TOTAL	573	275	732	779	836	807	765

Saturday 8-Feb-20

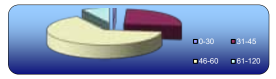
Sunday 9-Feb-20



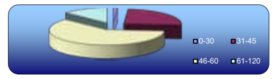
Monday 10-Feb-20



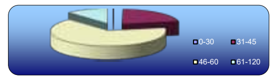
Tuesday 11-Feb-20



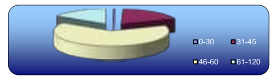
Wednesday 12-Feb-20



Thursday 13-Feb-20



Friday 14-Feb-20



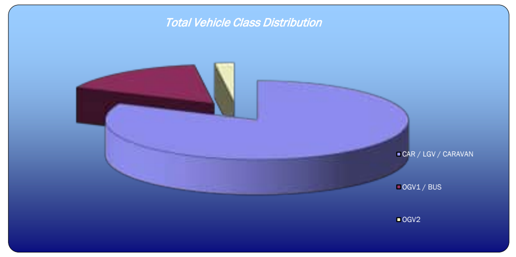
Automatic Classified Counts

LOCATION: PARSONBY BROW

Direction : NORTHBOUND

VEHICLE CLASSIFICATION

	CAR / LGV / CARAVAN	OGV1 / BUS	OGV2	TOTAL
8-Feb-20				
7-19	409	55	2	466
6-22	470	60	2	532
6-24	488	62	2	552
0-24	508	63	2	573
9-Feb-20				
7-19	160	39	2	201
6-22	199	45	3	247
6-24	209	46	3	258
0-24	224	48	3	275
10-Feb-20				
7-19	507	104	12	623
6-22	573	115	12	700
6-24	588	117	12	717
0-24	600	120	12	732
11-Feb-20				
7-19	577	72	15	664
6-22	646	81	15	742
6-24	666	82	17	765
0-24	678	83	18	779
12-Feb-20				
7-19	560	120	23	703
6-22	643	129	25	797
6-24	659	132	25	816
0-24	676	134	26	836
13-Feb-20				
7-19	528	139	16	683
6-22	600	145	17	762
6-24	624	147	17	788
0-24	639	151	17	807
14-Feb-20				
7-19	523	110	13	646
6-22	580	118	13	711
6-24	598	119	13	730
0-24	629	123	13	765
AVERAGE				
7-19	466	91	12	569
6-22	530	99	12	642
6-24	547	101	13	661
0-24	565	103	13	681



56-60	61-70	71-80	81-120	TOTAL
0	0	0	0	3
0	0	0	0	0
0	0	0	0	0
0	0	0	0	1
0	0	0	0	2
0	0	0	0	13
0	3	0	0	19
5	5	0	0	55
9	5	0	0	64
8	3	1	0	43
4	1	1	0	45
3	3	0	1	42
4	5	1	0	37
10	7	2	0	50
6	2	0	0	48
16	7	2	1	62
16	15	1	1	87
20	8	1	1	100
3	5	0	1	50
3	3	0	0	26
3	4	0	0	21
2	0	0	0	13
4	4	0	0	18
0	0	0	1	8
104	66	9	5	683
112	76	9	5	762
116	80	9	6	788
116	80	9	6	807

56-60	61-70	71-80	81-120	TOTAL
0	0	0	0	1
0	0	0	0	2
1	0	0	0	5
0	0	0	0	2
0	0	1	0	5
1	4	0	0	20
1	1	0	0	37
10	7	0	0	103
7	0	1	0	94
2	2	0	0	65
5	1	0	0	61
5	1	0	0	63
0	2	1	0	50
1	1	0	0	37
5	0	0	0	56
3	3	1	0	59
3	5	0	0	61
2	1	1	0	60
4	2	0	0	33
6	7	0	0	26
1	3	1	0	21
5	2	0	0	14
0	6	1	0	14
1	0	0	0	5
47	25	4	0	742
60	38	5	0	840
61	44	6	0	859
63	48	7	0	894

Automatic Classified Counts

LOCATION: PARSONBY BROW

Direction : NORTHBOUND

Friday 14/02/2020 Hr Ending	VEHICLE SPEED (MPH) 0-10	11-20	21-30	31-35	36-40	41-45	46-50	51-55	56-60	61-70	71-80	81-120	TOTAL
1	0	0	0	0	0	3	0	0	1	0	0	0	4
2	0	0	0	0	0	0	0	1	0	0	0	0	1
3	0	0	0	0	0	0	3	0	1	1	0	0	5
4	0	0	0	0	0	1	0	0	1	0	0	0	2
5	0	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	2	4	3	7	7	0	0	23
7	0	0	0	0	0	2	2	1	4	0	1	1	11
8	0	0	0	0	3	7	10	11	6	3	0	0	40
9	0	0	0	0	2	6	13	12	11	7	1	2	54
10	0	0	0	0	4	5	10	10	4	3	2	0	38
11	0	0	0	0	4	4	9	7	4	6	0	0	34
12	0	0	0	1	2	13	11	16	8	4	3	0	58
13	0	0	0	1	3	5	12	12	5	8	0	1	47
14	0	0	0	1	2	6	8	14	8	9	3	0	51
15	0	0	4	0	2	9	9	12	12	11	0	0	59
16	0	0	0	0	0	12	11	26	14	6	2	0	71
17	0	0	0	0	0	13	18	30	18	17	2	1	99
18	0	0	0	3	1	13	12	17	15	5	2	0	68
19	0	0	0	0	0	1	2	8	10	4	1	1	27
20	0	0	0	0	0	0	10	6	1	4	0	1	22
21	0	0	0	0	0	3	5	3	3	1	1	0	16
22	0	0	0	0	0	4	4	6	1	1	0	0	16
23	0	0	0	0	1	1	4	4	2	1	0	0	13
24	0	0	0	0	0	2	2	0	2	0	0	0	6
7-19	0	0	4	6	23	94	125	175	115	83	16	5	646
6-22	0	0	4	6	23	103	146	191	124	89	18	7	711
6-24	0	0	4	6	24	106	152	195	128	90	18	7	730
0-24	0	0	4	6	24	112	159	199	138	98	18	7	765

Direction : SOUTHBOUND

Friday 14/02/2020 Hr Ending	VEHICLE SPEED (MPH) 0-10	11-20	21-30	31-35	36-40	41-45	46-50	51-55	56-60	61-70	71-80	81-120	TOTAL
1	0	0	0	2	0	1	2	0	1	1	0	0	7
2	0	0	0	0	0	2	0	0	0	0	0	0	2
3	0	0	0	0	0	1	0	0	0	0	0	0	1
4	0	0	0	0	0	0	0	0	1	0	0	0	1
5	0	0	0	0	0	0	1	3	0	1	0	0	5
6	0	0	0	0	1	3	8	3	1	1	1	0	18
7	0	0	0	1	0	10	9	6	5	5	2	0	38
8	0	0	0	1	2	8	26	34	9	1	0	0	81
9	0	0	0	1	9	14	40	16	6	3	0	0	89
10	0	0	3	5	4	22	16	11	5	1	1	0	68
11	0	0	1	1	14	12	10	13	4	1	0	1	57
12	0	1	6	3	4	10	14	12	3	1	0	0	54
13	0	0	0	3	12	12	14	3	8	4	1	0	57
14	0	0	4	5	6	13	22	12	5	1	1	0	69
15	0	1	2	2	2	13	11	14	2	0	0	0	47
16	0	1	0	1	0	9	19	14	3	3	0	0	50
17	0	0	2	7	0	9	11	14	10	4	2	0	59
18	0	0	0	3	4	11	17	11	6	0	0	0	52
19	0	0	0	1	5	7	4	11	1	4	1	0	34
20	0	0	0	0	0	3	4	7	4	3	0	1	22
21	0	0	0	0	0	1	2	2	1	0	0	0	6
22	0	0	0	1	2	3	3	0	3	1	0	0	13
23	0	0	0	0	0	3	1	2	0	0	0	0	6
24	0	0	0	0	0	3	3	1	0	0	0	0	7
7-19	0	3	18	33	62	140	204	165	62	23	6	1	717
6-22	0	3	18	35	64	157	222	180	75	32	8	2	796
6-24	0	3	18	35	64	163	226	183	75	32	8	2	809
0-24	0	3	18	37	65	170	237	189	78	35	9	2	843

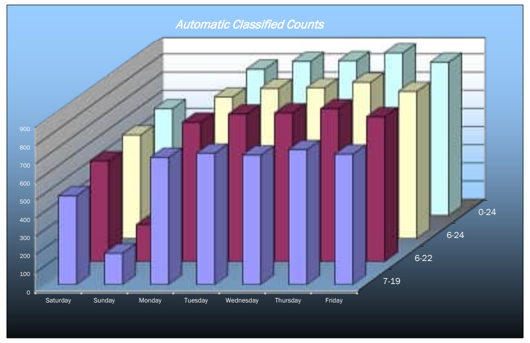
Automatic Classified Counts

LOCATION: PARSONBY BROW

Direction : SOUTHBOUND

SOUTHBOUND

Hr Ending	Saturday 8-Feb-20	Sunday 9-Feb-20	Monday 10-Feb-20	Tuesday 11-Feb-20	Wednesday 12-Feb-20	Thursday 13-Feb-20	Friday 14-Feb-20	WEEKDAY AVERAGE	WEEK AVERAGE
1	1	3	3	1	5	1	7	3	3
2	3	4	0	3	1	2	2	2	2
3	0	1	3	0	2	5	1	2	2
4	2	0	0	1	0	2	1	1	1
5	3	2	4	3	4	5	5	4	4
6	9	7	16	14	10	20	18	16	13
7	11	5	29	39	47	37	38	38	29
8	23	3	93	90	79	103	81	89	67
9	41	9	95	100	89	94	89	93	74
10	54	7	46	50	67	65	68	59	51
11	52	11	60	46	50	61	57	55	48
12	57	22	44	42	56	63	54	52	48
13	46	21	46	48	51	50	57	50	46
14	50	19	48	45	51	37	69	50	46
15	30	16	50	44	68	56	47	53	44
16	46	15	54	64	61	59	50	58	50
17	30	21	73	86	66	61	59	69	57
18	33	8	57	56	39	60	52	53	44
19	26	20	33	51	35	33	34	37	33
20	18	13	13	22	32	26	22	23	21
21	13	9	12	11	13	21	6	13	12
22	23	4	13	17	13	14	13	14	14
23	8	4	8	9	8	14	6	9	8
24	8	3	4	5	4	5	7	5	5
7-19	488	172	699	722	712	742	717	718	607
6-22	553	203	766	811	817	840	796	806	684
6-24	569	210	778	825	829	859	809	820	697
0-24	587	227	804	847	851	894	843	848	722



Automatic Classified Counts

LOCATION: PARSONBY BROW

Direction : SOUTHBOUND

AVERAGE SPEEDS

Hr Ending	Saturday 8-Feb-20	Sunday 9-Feb-20	Monday 10-Feb-20	Tuesday 11-Feb-20	Wednesday 12-Feb-20	Thursday 13-Feb-20	Friday 14-Feb-20
1	48.0	41.3	44.7	53.0	47.0	43.0	46.9
2	40.5	45.5	-	49.7	53.0	40.5	43.0
3	-	53.0	48.0	-	56.8	46.0	43.0
4	59.3	-	-	58.0	-	48.0	58.0
5	62.2	48.0	56.1	55.5	56.1	52.5	54.5
6	46.3	48.7	50.3	53.5	52.8	51.3	50.5
7	49.4	43.0	52.9	52.4	46.8	48.3	52.1
8	51.5	44.7	48.1	47.8	46.9	48.5	50.5
9	50.3	41.3	49.6	47.9	48.8	47.2	48.2
10	50.1	45.9	44.7	47.7	46.8	45.7	45.9
11	49.0	45.5	43.5	44.4	44.5	47.1	46.9
12	46.1	43.7	45.9	47.9	43.3	44.8	44.4
13	46.8	44.7	46.8	44.0	45.1	46.5	47.4
14	48.4	44.8	44.8	45.9	46.5	41.5	46.0
15	47.7	48.5	44.6	45.6	46.3	45.5	45.8
16	46.4	45.2	48.8	42.8	47.9	48.0	49.2
17	49.2	49.2	47.4	45.7	50.7	49.4	49.7
18	46.0	51.4	47.8	45.7	48.6	46.4	47.5
19	46.3	47.5	47.0	45.4	49.7	49.2	49.8
20	41.9	54.5	52.2	47.5	44.9	55.4	55.5
21	45.9	45.2	43.4	46.2	47.6	50.9	50.5
22	38.1	54.9	54.3	51.4	54.7	55.5	47.8
23	40.2	58.6	49.6	49.7	53.3	55.7	47.2
24	44.3	44.7	50.5	48.0	45.5	48.0	46.6
10-12	47.5	44.6	44.7	46.1	43.9	45.9	45.6
14-16	47.0	46.8	46.7	44.2	47.1	46.7	47.5
0-24	47.5	47.4	48.2	48.5	48.9	48.1	48.6

85TH PERCENTILE

Hr Ending	Saturday 8-Feb-20	Sunday 9-Feb-20	Monday 10-Feb-20	Tuesday 11-Feb-20	Wednesday 12-Feb-20	Thursday 13-Feb-20	Friday 14-Feb-20
1	-	47.1	47.6	-	52.5	-	59.0
2	53.5	48.4	-	52.6	-	44.0	43.0
3	-	-	56.7	-	69.1	52.7	-
4	68.1	-	-	-	-	55.1	-
5	74.0	62.1	63.6	64.5	63.6	66.9	61.0
6	50.7	55.4	59.7	59.9	59.3	60.2	59.2
7	53.9	46.5	61.1	59.4	52.8	53.9	61.9
8	59.5	52.3	58.1	56.2	55.6	56.9	55.7
9	57.8	48.4	57.0	54.7	55.3	55.1	54.4
10	61.3	53.4	51.4	55.5	54.8	53.9	54.7
11	57.7	54.5	50.7	51.7	52.5	53.5	57.4
12	54.3	51.6	51.7	55.1	50.7	54.4	54.7
13	58.8	53.6	53.7	50.0	55.8	54.8	56.9
14	57.5	50.2	54.2	53.9	54.4	50.5	55.2
15	54.0	55.6	54.9	54.6	52.9	52.8	54.4
16	54.1	53.1	57.9	51.5	55.7	56.2	57.0
17	55.2	57.7	56.3	53.4	60.2	56.6	60.5
18	54.1	62.5	53.0	51.8	56.1	54.3	54.1
19	55.2	52.1	54.1	53.9	56.4	57.3	59.6
20	51.0	69.6	62.1	57.1	55.6	63.3	67.6
21	54.9	48.9	51.5	52.6	55.1	61.0	55.7
22	47.0	64.3	63.2	57.0	60.3	61.5	57.4
23	47.9	63.8	58.5	62.6	65.9	67.9	52.1
24	49.4	50.4	55.5	48.0	48.4	54.1	50.4
10-12	56.0	53.1	51.2	53.4	51.6	53.9	56.0
14-16	54.0	54.3	56.4	53.1	54.3	54.5	55.7
0-24	55.9	54.6	56.0	55.1	56.5	56.4	56.4

7 DAY AVERAGE SPEED	48.2
7 DAY AVERAGE 85th PERCENTILE	55.9

Automatic Classified Counts

LOCATION: PARSONBY BROW

Direction : SOUTHBOUND

SPEED SUMMARY

SPEED (MPH)	Saturday 8-Feb-20	Sunday 9-Feb-20	Monday 10-Feb-20	Tuesday 11-Feb-20	Wednesday 12-Feb-20	Thursday 13-Feb-20	Friday 14-Feb-20
0-30	17	0	22	15	11	15	21
31-45	231	105	301	342	342	344	272
46-60	306	110	440	461	451	480	504
61-120	33	12	41	29	47	55	46
TOTAL	587	227	804	847	851	894	843

Saturday 8-Feb-20

Sunday 9-Feb-20

Monday 10-Feb-20

Tuesday 11-Feb-20

Wednesday 12-Feb-20

Thursday 13-Feb-20

Friday 14-Feb-20

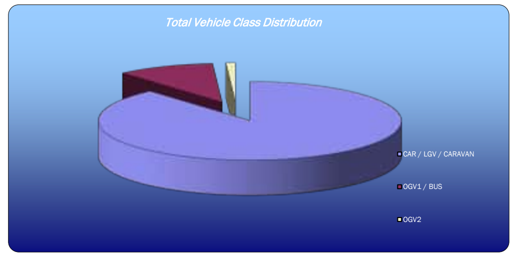
Automatic Classified Counts

LOCATION: PARSONBY BROW

Direction : SOUTHBOUND

VEHICLE CLASSIFICATION

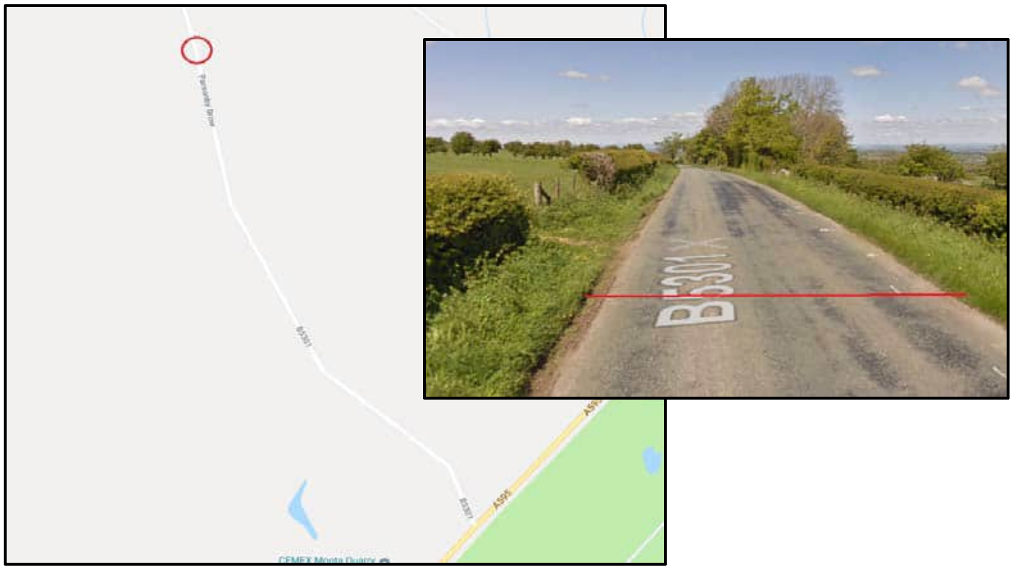
	CAR / LGV / CARAVAN	OGV1 / BUS	OGV2	TOTAL
8-Feb-20				
7-19	439	48	1	488
6-22	501	51	1	553
6-24	516	52	1	569
0-24	533	53	1	587
9-Feb-20				
7-19	156	16	0	172
6-22	186	17	0	203
6-24	192	18	0	210
0-24	207	20	0	227
10-Feb-20				
7-19	630	65	4	699
6-22	693	69	4	766
6-24	705	69	4	778
0-24	729	71	4	804
11-Feb-20				
7-19	656	61	5	722
6-22	738	68	5	811
6-24	751	69	5	825
0-24	771	71	5	847
12-Feb-20				
7-19	622	82	8	712
6-22	718	90	9	817
6-24	730	90	9	829
0-24	750	92	9	851
13-Feb-20				
7-19	642	90	10	742
6-22	737	92	11	840
6-24	755	93	11	859
0-24	786	97	11	894
14-Feb-20				
7-19	621	81	15	717
6-22	698	83	15	796
6-24	711	83	15	809
0-24	741	86	16	843
AVERAGE				
7-19	538	63	6	607
6-22	610	67	6	684
6-24	623	68	6	697
0-24	645	70	7	722



Unit D Baron Way
Kingmoor Business Park
Carlisle CA6 4SJ

Parsonby Brow ATC Report

Locate site on Google Maps (click here)



Survey Report Dates 22 to 28 January 2018

Report Type EURO 13 Classified & Speed Bin with daily summary report

Notes:

Unit D Baron Way
Kingmoor Business Park
Carlisle CA6 4SJ

Site No. 10218001 Site Ref. 10218001
B5301 Parsonby Brow Parsonby Wigton
Speed Report (Speed Limit 60 Mph) 22 January 2018 Channel: Northbound

	Total Volume	85th %ile	Mean Ave.	Std. Dev.	Bin 1 <5MPH	Bin 2 5-<10	Bin 3 10-<15	Bin 4 15-<20	Bin 5 20-<25	Bin 6 25-<30	Bin 7 30-<35	Bin 8 35-<40	Bin 9 40-<45	Bin 10 45-<50	Bin 11 50-<55	Bin 12 55-<60	Bin 13 =>60
00:00	0				0	0	0	0	0	0	0	0	0	0	0	0	0
01:00	2		39	21	0	0	0	1	0	0	0	0	0	0	0	0	1
02:00	0				0	0	0	0	0	0	0	0	0	0	0	0	0
03:00	1		48	0	0	0	0	0	0	0	0	0	0	1	0	0	0
04:00	2		55	3	0	0	0	0	0	0	0	0	0	0	1	1	0
05:00	11	56	49	7	0	0	0	0	0	0	0	2	2	0	4	3	0
06:00	16	57	50	6	0	0	0	0	0	0	0	1	2	7	2	3	1
07:00	31	57	47	7	0	0	0	0	0	0	1	2	12	6	3	5	2
08:00	45	57	48	7	0	0	0	0	0	0	1	4	12	10	6	10	2
09:00	30	57	49	7	0	0	0	0	0	1	0	0	7	8	6	8	0
10:00	36	55	48	6	0	0	0	0	0	0	0	2	12	9	7	3	3
11:00	45	54	47	6	0	0	0	0	0	0	1	3	13	15	7	5	1
12:00	44	54	45	10	0	0	0	1	1	3	2	4	9	6	13	2	3
13:00	47	56	47	9	0	0	1	0	0	0	0	7	11	10	10	4	4
14:00	45	56	49	6	0	0	0	0	0	0	1	3	5	15	13	6	2
15:00	64	59	50	8	0	0	0	0	0	1	0	9	4	12	17	15	6
16:00	84	59	51	7	0	0	1	0	0	0	0	3	9	26	21	14	10
17:00	78	58	51	6	0	0	0	0	0	0	0	5	8	24	18	19	4
18:00	54	55	47	8	0	0	0	0	0	0	4	7	12	8	15	6	2
19:00	19	56	49	7	0	0	0	0	0	0	2	0	2	5	6	3	1
20:00	24	55	46	9	0	0	0	0	0	0	3	5	3	2	7	1	3
21:00	9		46	9	0	0	0	0	0	0	1	2	2	0	3	0	1
22:00	10		50	11	0	0	0	0	0	0	2	0	2	1	0	0	5
23:00	2		35	3	0	0	0	0	0	0	1	1	0	0	0	0	0
Total																	
12H(7-19)	603	57	49	8	0	0	2	1	1	5	10	49	114	149	136	97	39
16H(6-22)	671	57	49	8	0	0	2	1	1	5	16	57	123	163	154	104	45
18H(6-24)	683	57	49	8	0	0	2	1	1	5	19	58	125	164	154	104	50
24H(0-24)	699	57	49	8	0	0	2	2	1	5	19	60	127	165	159	108	51
AM Peak	11:00				11:00	11:00	11:00	01:00	11:00	09:00	11:00	08:00	11:00	11:00	11:00	08:00	10:00
	45				0	0	0	1	0	1	1	4	13	15	7	10	3
PM Peak	16:00	16:00	16:00	22:00	23:00	23:00	16:00	12:00	12:00	12:00	18:00	15:00	18:00	16:00	16:00	17:00	16:00
	84	59	51	11	0	0	1	1	1	3	4	9	12	26	21	19	10

VDA-pro R2 29/01/2018

Site No. 10218001 Site Ref. 10218001
B5301 Parsonby Brow Parsonby Wigton
Speed Report (Speed Limit 60 Mph) 23 January 2018 Channel: Northbound

	Total Volume	85th %ile	Mean Ave.	Std. Dev.	Bin 1 <5MPH	Bin 2 5-<10	Bin 3 10-<15	Bin 4 15-<20	Bin 5 20-<25	Bin 6 25-<30	Bin 7 30-<35	Bin 8 35-<40	Bin 9 40-<45	Bin 10 45-<50	Bin 11 50-<55	Bin 12 55-<60	Bin 13 =>60
00:00	3		38	7	0	0	0	0	0	0	2	0	0	1	0	0	0
01:00	2		48	5	0	0	0	0	0	0	0	0	1	0	1	0	0
02:00	2		54	6	0	0	0	0	0	0	0	0	0	1	0	0	1
03:00	0				0	0	0	0	0	0	0	0	0	0	0	0	0
04:00	0				0	0	0	0	0	0	0	0	0	0	0	0	0
05:00	12	56	48	7	0	0	0	0	0	0	0	2	3	2	2	3	0
06:00	14	59	50	8	0	0	0	0	0	0	0	2	2	4	1	3	2
07:00	30	53	45	9	0	1	0	0	0	0	0	2	12	9	2	2	2
08:00	51	56	48	8	0	0	0	0	2	0	0	3	8	17	12	4	5
09:00	47	57	46	10	0	0	1	0	0	2	1	4	12	14	3	5	5
10:00	33	48	43	6	0	0	0	0	0	0	2	9	13	6	1	2	0
11:00	33	57	46	11	0	1	0	0	0	2	0	4	5	8	6	5	2
12:00	39	54	47	7	0	0	0	0	0	0	2	4	7	15	6	3	2
13:00	50	59	49	8	0	0	1	0	0	0	0	2	12	13	11	4	7
14:00	50	55	47	7	0	0	0	0	0	0	3	5	15	8	12	6	1
15:00	72	57	48	8	0	0	1	0	0	1	1	4	18	22	11	9	5
16:00	77	58	50	7	0	0	0	0	0	0	1	3	14	18	22	11	8
17:00	84	57	47	9	0	0	0	2	0	0	0	17	20	11	17	10	7
18:00	59	55	48	7	0	0	0	0	0	0	1	7	9	17	15	7	3
19:00	22	55	50	5	0	0	0	0	0	0	0	1	2	9	6	3	1
20:00	21	57	48	7	0	0	0	0	0	0	0	2	7	5	2	4	1
21:00	15	54	48	6	0	0	0	0	0	0	0	1	4	4	4	1	1
22:00	10		54	7	0	0	0	0	0	0	0	0	2	1	1	4	2
23:00	1		43	0	0	0	0	0	0	0	0	0	1	0	0	0	0
Total																	
12H(7-19)	625	57	47	8	0	2	3	2	2	5	11	64	145	158	118	68	47
16H(6-22)	697	57	48	8	0	2	3	2	2	5	11	70	160	180	131	79	52
18H(6-24)	708	57	48	8	0	2	3	2	2	5	11	70	163	181	132	83	54
24H(0-24)	727	57	48	8	0	2	3	2	2	5	13	72	167	185	135	86	55
AM Peak	08:00		02:00	11:00	11:00	11:00	09:00	11:00	08:00	11:00	10:00	10:00	10:00	08:00	08:00	11:00	09:00
	51		54	11	0	1	1	0	2	2	2	9	13	17	12	5	5
PM Peak	17:00	13:00	22:00	17:00	23:00	23:00	15:00	17:00	23:00	15:00	14:00	17:00	17:00	15:00	16:00	16:00	16:00
	84	59	54	9	0	0	1	2	0	1	3	17	20	22	22	11	8

VDA-pro R2 29/01/2018

Site No. 10218001 Site Ref. 10218001
B5301 Parsonby Brow Parsonby Wigton
Speed Report (Speed Limit 60 Mph) 22 January 2018 Channel: Southbound

	Total Volume	85th %ile	Mean Ave.	Std. Dev.	Bin 1 <5MPH	Bin 2 5-<10	Bin 3 10-<15	Bin 4 15-<20	Bin 5 20-<25	Bin 6 25-<30	Bin 7 30-<35	Bin 8 35-<40	Bin 9 40-<45	Bin 10 45-<50	Bin 11 50-<55	Bin 12 55-<60	Bin 13 =>60
00:00	0				0	0	0	0	0	0	0	0	0	0	0	0	0
01:00	1		43	0	0	0	0	0	0	0	0	0	1	0	0	0	0
02:00	1		53	0	0	0	0	0	0	0	0	0	0	0	1	0	0
03:00	4		45	4	0	0	0	0	0	0	0	0	3	0	1	0	0
04:00	11		54	4	0	0	0	0	0	0	0	0	0	2	4	3	2
05:00	11	53	49	4	0	0	0	0	0	0	0	0	2	5	3	1	0
06:00	31	55	49	5	0	0	0	0	0	0	0	1	5	11	9	5	0
07:00	61	51	44	7	0	0	0	0	0	1	6	8	15	19	9	2	1
08:00	98	50	44	6	0	0	0	0	0	3	6	13	39	22	10	5	0
09:00	50	50	43	8	0	0	0	1	0	3	1	8	16	13	6	2	0
10:00	35	48	42	7	0	0	0	0	1	1	2	8	12	8	3	0	0
11:00	59	50	42	9	0	0	1	0	1	3	5	10	18	12	6	2	1
12:00	53	47	38	10	1	0	1	0	3	5	5	15	11	9	2	1	0
13:00	48	50	41	10	0	1	0	0	2	6	1	10	11	9	6	2	0
14:00	43	52	43	8	0	0	0	0	2	3	1	7	13	7	9	1	0
15:00	55	50	44	7	0	0	0	0	0	0	4	13	17	12	6	1	2
16:00	50	54	44	10	0	0	0	0	3	2	2	10	9	8	9	4	3
17:00	51	52	43	7	0	0	0	0	0	1	4	14	14	7	8	0	3
18:00	31	50	45	6	0	0	0	0	0	0	0	8	9	9	3	1	1
19:00	12		46	12	0	0	0	0	1	1	0	1	3	1	1	2	2
20:00	8		46	4	0	0	0	0	0	0	0	0	5	1	2	0	0
21:00	9		45	5	0	0	0	0	0	0	1	0	3	4	1	0	0
22:00	13	53	46	7	0	0	0	0	0	0	0	3	3	2	4	1	0
23:00	1		43	0	0	0	0	0	0	0	0	0	1	0	0	0	0
Total																	
12H(7-19)	634	51	43	8	1	1	2	1	12	28	37	124	184	135	77	21	11
16H(6-22)	694	51	43	8	1	1	2	1	13	29	38	126	200	152	90	28	13
18H(6-24)	708	52	43	8	1	1	2	1	13	29	38	129	204	154	94	29	13
24H(0-24)	736	52	43	8	1	1	2	1	13	29	38	129	210	161	103	33	15
AM Peak	08:00				11:00	11:00	11:00	09:00	11:00	11:00	08:00	08:00	08:00	08:00	08:00	08:00	04:00
	98				0	0	1	1	1	3	6	13	39	22	10	5	2
PM Peak	15:00	16:00	22:00	19:00	12:00	13:00	12:00	23:00	16:00	13:00	12:00	12:00	15:00	15:00	16:00	16:00	17:00
	55	54	46	12	1	1	1	0	3	6	5	15	17	12	9	4	3

VDA-pro R2 29/01/2018

Site No. 10218001 Site Ref. 10218001
B5301 Parsonby Brow Parsonby Wigton
Speed Report (Speed Limit 60 Mph) 23 January 2018 Channel: Southbound

	Total Volume	85th %ile	Mean Ave.	Std. Dev.	Bin 1 <5MPH	Bin 2 5-<10	Bin 3 10-<15	Bin 4 15-<20	Bin 5 20-<25	Bin 6 25-<30	Bin 7 30-<35	Bin 8 35-<40	Bin 9 40-<45	Bin 10 45-<50	Bin 11 50-<55	Bin 12 55-<60	Bin 13 =>60
00:00	8		55	4	0	0	0	0	0	0	0	0	0	1	2	4	1
01:00	1		43		0	0	0	0	0	0	0	0	1	0	0	0	0
02:00	0				0	0	0	0	0	0	0	0	0	0	0	0	0
03:00	1		48	0	0	0	0	0	0	0	0	0	0	1	0	0	0
04:00	2		55	3	0	0	0	0	0	0	0	0	0	0	1	1	0
05:00	13	56	48	8	0	0	0	0	0	0	1	1	3	3	2	2	1
06:00	31	54	48	5	0	0	0	0	0	0	0	2	5	13	8	3	0
07:00	63	51	43	8	0	0	1	0	0	5	1	12	20	13	10	0	1
08:00	100	53	44	8	0	0	0	2	0	2	8	19	27	16	17	7	2
09:00	37	53	43	10	0	0	1	0	2	1	3	4	10	6	7	3	0
10:00	48	50	42	7	0	0	1	0	0	0	4	16	13	7	6	1	0
11:00	45	46	39	8	0	0	0	0	6	0	3	11	16	6	2	1	0
12:00	43	49	41	9	0	0	0	1	0	5	3	6	15	7	5	0	1
13:00	39	51	43	10	0	1	1	0	0	1	2	6	11	10	5	1	1
14:00	46	47	40	7	0	0	1	0	1	2	3	13	14	11	1	0	0
15:00	55	50	41	9	0	0	2	0	1	2	4	12	17	9	5	1	2
16:00	48	54	46	7	0	0	0	0	0	0	2	8	11	13	8	4	2
17:00	45	51	44	6	0	0	0	0	0	0	4	5	15	13	7	0	1
18:00	24	50	43	7	0	1	0	0	0	0	0	7	8	4	2	2	0
19:00	24	56	48	7	0	0	0	0	0	0	1	3	4	7	4	4	1
20:00	12	57	47	7	0	0	0	0	0	0	0	2	3	4	0	2	1
21:00	10	50	45	7	0	0	0	0	0	0	0	3	2	3	1	0	1
22:00	5		52	6	0	0	0	0	0	0	0	0	1	0	3	0	1
23:00	1		58	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Total																	
12H(7-19)	593	51	43	9	0	2	7	3	10	18	37	119	177	115	75	20	10
16H(6-22)	670	52	43	9	0	2	7	3	10	18	38	129	191	142	88	29	13
18H(6-24)	676	52	43	9	0	2	7	3	10	18	38	129	192	142	91	30	14
24H(0-24)	701	52	43	9	0	2	7	3	10	18	39	130	196	147	96	37	16
AM Peak	08:00		00:00	09:00	11:00	11:00	10:00	08:00	11:00	07:00	08:00	08:00	08:00	08:00	08:00	08:00	08:00
	100		55	10	0	0	1	2	6	5	8	19	27	16	17	7	2
PM Peak	15:00	20:00	23:00	13:00	23:00	18:00	15:00	12:00	15:00	12:00	17:00	14:00	15:00	17:00	16:00	19:00	16:00
	55	57	58	10	0	1	2	1	1	5	4	13	17	13	8	4	2

VDA-pro R2 29/01/2018

Site No. 10218001 Site Ref. 10218001
B5301 Parsonby Brow Parsonby Wigton
Speed Report (Speed Limit 60 Mph) 22 January 2018 Channel: Total Flow

	Total Volume	85th %ile	Mean Ave.	Std. Dev.	Bin 1 <5MPH	Bin 2 5-<10	Bin 3 10-<15	Bin 4 15-<20	Bin 5 20-<25	Bin 6 25-<30	Bin 7 30-<35	Bin 8 35-<40	Bin 9 40-<45	Bin 10 45-<50	Bin 11 50-<55	Bin 12 55-<60	Bin 13 =>60
00:00	0				0	0	0	0	0	0	0	0	0	0	0	0	0
01:00	3		40	18	0	0	0	1	0	0	0	0	1	0	0	0	1
02:00	1		53	0	0	0	0	0	0	0	0	0	0	0	1	0	0
03:00	5		46	4	0	0	0	0	0	0	0	0	3	1	1	0	0
04:00	13		54	4	0	0	0	0	0	0	0	0	0	2	5	4	2
05:00	22	55	49	6	0	0	0	0	0	0	0	2	4	5	7	4	0
06:00	47	56	49	6	0	0	0	0	0	0	0	2	7	18	11	8	1
07:00	92	53	45	7	0	0	0	0	0	1	7	10	27	25	12	7	3
08:00	143	53	45	7	0	0	0	0	0	3	7	17	51	32	16	15	2
09:00	80	54	46	8	0	0	0	1	0	4	1	8	23	21	12	10	0
10:00	71	52	45	7	0	0	0	0	1	1	2	10	24	17	10	3	3
11:00	104	52	44	8	0	0	1	0	1	3	6	13	31	27	13	7	2
12:00	97	52	41	11	1	0	1	1	4	8	7	19	20	15	15	3	3
13:00	95	54	44	10	0	1	1	0	2	6	1	17	22	19	16	6	4
14:00	88	54	46	8	0	0	0	0	2	3	2	10	18	22	22	7	2
15:00	119	57	47	8	0	0	0	0	0	1	4	22	21	24	23	16	8
16:00	134	58	48	9	0	0	1	0	3	2	2	13	18	34	30	18	13
17:00	129	57	48	8	0	0	0	0	0	1	4	19	22	31	26	19	7
18:00	85	54	46	7	0	0	0	0	0	0	4	15	21	17	18	7	3
19:00	31	58	48	10	0	0	0	0	1	1	2	1	5	6	7	5	3
20:00	32	54	46	8	0	0	0	0	0	0	3	5	8	3	9	1	3
21:00	18	52	45	7	0	0	0	0	0	0	2	2	5	4	4	0	1
22:00	23		48	9	0	0	0	0	0	0	2	3	5	3	4	1	5
23:00	3		38	4	0	0	0	0	0	0	1	1	1	0	0	0	0
Total																	
12H(7-19)	1237	55	46	8	1	1	4	2	13	33	47	173	298	284	213	118	50
16H(6-22)	1365	55	46	8	1	1	4	2	14	34	54	183	323	315	244	132	58
18H(6-24)	1391	55	46	8	1	1	4	2	14	34	57	187	329	318	248	133	63
24H(0-24)	1435	55	46	8	1	1	4	3	14	34	57	189	337	326	262	141	66
AM Peak	08:00				11:00	11:00	11:00	09:00	11:00	09:00	08:00	08:00	08:00	08:00	08:00	08:00	10:00
	143				0	0	1	1	1	4	7	17	51	32	16	15	3
PM Peak	16:00	16:00	16:00	12:00	12:00	13:00	16:00	12:00	12:00	12:00	12:00	15:00	17:00	16:00	16:00	17:00	16:00
	134	58	48	11	1	1	1	1	4	8	7	22	22	34	30	19	13

VDA-pro R2 29/01/2018

Site No. 10218001 Site Ref. 10218001
B5301 Parsonby Brow Parsonby Wigton
Speed Report (Speed Limit 60 Mph) 23 January 2018 Channel: Total Flow

	Total Volume	85th %ile	Mean Ave.	Std. Dev.	Bin 1 <5MPH	Bin 2 5-<10	Bin 3 10-<15	Bin 4 15-<20	Bin 5 20-<25	Bin 6 25-<30	Bin 7 30-<35	Bin 8 35-<40	Bin 9 40-<45	Bin 10 45-<50	Bin 11 50-<55	Bin 12 55-<60	Bin 13 =>60
00:00	11	59	50	9	0	0	0	0	0	0	2	0	0	2	2	4	1
01:00	3		46	5	0	0	0	0	0	0	0	0	2	0	1	0	0
02:00	2		54	6	0	0	0	0	0	0	0	0	0	1	0	0	1
03:00	1		48	0	0	0	0	0	0	0	0	0	0	1	0	0	0
04:00	2		55	3	0	0	0	0	0	0	0	0	0	0	1	1	0
05:00	25	57	48	8	0	0	0	0	0	0	1	3	6	5	4	5	1
06:00	45	56	49	6	0	0	0	0	0	0	0	4	7	17	9	6	2
07:00	93	51	44	9	0	1	1	0	0	5	1	14	32	22	12	2	3
08:00	151	54	45	9	0	0	0	2	2	2	8	22	35	33	29	11	7
09:00	84	55	45	10	0	0	2	0	2	3	4	8	22	20	10	8	5
10:00	81	49	42	7	0	0	1	0	0	0	6	25	26	13	7	3	0
11:00	78	52	42	10	0	1	0	0	6	2	3	15	21	14	8	6	2
12:00	82	52	44	8	0	0	0	1	0	5	5	10	22	22	11	3	3
13:00	89	55	46	10	0	1	2	0	0	1	2	8	23	23	16	5	8
14:00	96	52	44	8	0	0	1	0	1	2	6	18	29	19	13	6	1
15:00	127	54	45	9	0	0	3	0	1	3	5	16	35	31	16	10	7
16:00	125	57	49	7	0	0	0	0	0	0	3	11	25	31	30	15	10
17:00	129	55	46	8	0	0	0	2	0	0	4	22	35	24	24	10	8
18:00	83	55	47	8	0	1	0	0	0	0	1	14	17	21	17	9	3
19:00	46	56	49	7	0	0	0	0	0	0	1	4	6	16	10	7	2
20:00	33	57	48	7	0	0	0	0	0	0	0	4	10	9	2	6	2
21:00	25	54	47	7	0	0	0	0	0	0	0	4	6	7	5	1	2
22:00	15		53	6	0	0	0	0	0	0	0	0	3	1	4	4	3
23:00	2		50	8	0	0	0	0	0	0	0	0	1	0	0	1	0
Total																	
12H(7-19)	1218	54	45	9	0	4	10	5	12	23	48	183	322	273	193	88	57
16H(6-22)	1367	54	45	9	0	4	10	5	12	23	49	199	351	322	219	108	65
18H(6-24)	1384	54	45	9	0	4	10	5	12	23	49	199	355	323	223	113	68
24H(0-24)	1428	55	46	9	0	4	10	5	12	23	52	202	363	332	231	123	71
AM Peak	08:00	00:00	04:00	11:00	11:00	11:00	09:00	08:00	11:00	07:00	08:00	10:00	08:00	08:00	08:00	08:00	08:00
	151	59	55	10	0	1	2	2	6	5	8	25	35	33	29	11	7
PM Peak	17:00	20:00	22:00	13:00	23:00	18:00	15:00	17:00	15:00	12:00	14:00	17:00	17:00	16:00	16:00	16:00	16:00
	129	57	53	10	0	1	3	2	1	5	6	22	35	31	30	15	10

VDA-pro R2 29/01/2018

Site No. 10218001 Site Ref. 10218001
B5301 Parsonby Brow Parsonby Wigton
Speed Report (Speed Limit 60 Mph) 24 January 2018 Channel: Northbound

	Total Volume	85th %ile	Mean Ave.	Std. Dev.	Bin 1 <5MPH	Bin 2 5-<10	Bin 3 10-<15	Bin 4 15-<20	Bin 5 20-<25	Bin 6 25-<30	Bin 7 30-<35	Bin 8 35-<40	Bin 9 40-<45	Bin 10 45-<50	Bin 11 50-<55	Bin 12 55-<60	Bin 13 =>60
00:00	0				0	0	0	0	0	0	0	0	0	0	0	0	0
01:00	0				0	0	0	0	0	0	0	0	0	0	0	0	0
02:00	1		53	0	0	0	0	0	0	0	0	0	0	0	1	0	0
03:00	1		53	0	0	0	0	0	0	0	0	0	0	0	1	0	0
04:00	1		38	0	0	0	0	0	0	0	0	1	0	0	0	0	0
05:00	10	53	48	5	0	0	0	0	0	0	0	1	2	3	4	0	0
06:00	13	56	48	8	0	0	0	0	0	0	1	2	1	4	2	2	1
07:00	30	53	46	7	0	0	0	0	0	0	2	5	6	8	8	1	0
08:00	48	55	48	7	0	0	0	0	0	2	0	3	8	16	11	5	3
09:00	42	59	50	9	0	1	0	0	0	0	0	1	6	12	10	6	6
10:00	43	56	49	7	0	0	0	0	0	0	2	3	7	11	12	5	3
11:00	34	58	48	8	0	0	0	0	0	0	1	7	5	7	6	4	4
12:00	45		48	9	0	0	1	0	0	0	0	4	11	10	8	4	7
13:00	54	56	48	9	0	1	0	0	0	0	0	6	11	12	15	2	7
14:00	51	54	45	9	0	0	1	0	0	1	0	11	12	11	9	4	2
15:00	76	56	49	7	0	0	0	0	0	0	0	11	7	25	19	8	6
16:00	71	59	51	6	0	0	0	0	0	0	0	4	6	18	21	13	9
17:00	101	56	49	6	0	0	0	0	0	1	0	4	23	34	21	16	2
18:00	41	58	50	7	0	0	0	0	0	0	1	1	8	7	13	8	3
19:00	32	58	47	11	0	1	0	0	0	0	1	6	3	7	6	4	4
20:00	33	58	49	7	0	0	0	0	0	0	0	3	8	6	7	6	3
21:00	18		50	9	0	0	0	0	0	0	0	2	6	2	1	1	6
22:00	6		46	7	0	0	0	0	0	0	0	1	2	2	0	0	1
23:00	4		49	10	0	0	0	0	0	0	1	0	0	0	2	0	1
Total																	
12H(7-19)	636	57	49	8	0	2	2	0	0	4	6	60	110	171	153	76	52
16H(6-22)	732	58	49	8	0	3	2	0	0	4	8	73	128	190	169	89	66
18H(6-24)	742	58	49	8	0	3	2	0	0	4	9	74	130	192	171	89	68
24H(0-24)	755	57	49	8	0	3	2	0	0	4	9	76	132	195	177	89	68
AM Peak	08:00				11:00	09:00	11:00	11:00	11:00	08:00	10:00	11:00	08:00	08:00	10:00	09:00	09:00
	48				0	1	0	0	0	2	2	7	8	16	12	6	6
PM Peak	17:00		16:00	19:00	23:00	19:00	14:00	23:00	23:00	17:00	23:00	15:00	17:00	17:00	17:00	17:00	16:00
	101		51	11	0	1	1	0	0	1	1	11	23	34	21	16	9

VDA-pro R2 29/01/2018

Site No. 10218001 Site Ref. 10218001
B5301 Parsonby Brow Parsonby Wigton
Speed Report (Speed Limit 60 Mph) 25 January 2018 Channel: Northbound

	Total Volume	85th %ile	Mean Ave.	Std. Dev.	Bin 1 <5MPH	Bin 2 5-<10	Bin 3 10-<15	Bin 4 15-<20	Bin 5 20-<25	Bin 6 25-<30	Bin 7 30-<35	Bin 8 35-<40	Bin 9 40-<45	Bin 10 45-<50	Bin 11 50-<55	Bin 12 55-<60	Bin 13 =>60
00:00	4		51	8	0	0	0	0	0	0	0	0	2	0	0	1	1
01:00	2		43	10	0	0	0	0	0	0	1	0	0	0	1	0	0
02:00	0				0	0	0	0	0	0	0	0	0	0	0	0	0
03:00	0				0	0	0	0	0	0	0	0	0	0	0	0	0
04:00	0				0	0	0	0	0	0	0	0	0	0	0	0	0
05:00	9		50	7	0	0	0	0	0	0	0	0	3	2	1	2	1
06:00	15		50	11	0	0	0	1	0	0	0	1	2	3	0	5	3
07:00	34	58	49	8	0	0	0	0	0	0	0	6	6	7	5	8	2
08:00	52		49	8	0	0	0	0	0	0	2	4	9	14	10	5	8
09:00	49	56	46	11	0	1	0	0	2	2	1	4	4	20	6	6	3
10:00	43	59	50	7	0	0	0	0	0	1	0	1	9	11	8	7	6
11:00	55	56	49	7	0	0	0	0	1	0	1	2	11	17	13	7	3
12:00	38	55	47	7	0	0	0	0	0	0	1	6	7	13	5	4	2
13:00	61	53	45	7	0	0	0	0	0	2	2	10	19	14	8	5	1
14:00	55	57	49	9	0	1	0	0	0	0	1	3	11	13	15	7	4
15:00	79	55	46	8	0	0	1	0	0	0	3	11	22	17	12	10	3
16:00	81	59	51	7	0	0	0	0	0	0	2	3	12	18	23	13	10
17:00	83	57	49	6	0	0	0	0	0	1	0	2	19	24	18	16	3
18:00	42	55	49	6	0	0	0	0	0	0	0	4	7	11	13	5	2
19:00	28	54	47	9	0	0	1	0	0	0	2	0	5	10	6	3	1
20:00	14	59	48	9	0	0	0	0	0	0	2	1	2	3	2	2	2
21:00	16	58	48	11	0	0	1	0	0	0	0	1	2	5	3	2	2
22:00	12	54	47	7	0	0	0	0	0	0	0	3	2	3	2	1	1
23:00	6		53	8	0	0	0	0	0	0	0	1	0	1	1	1	2
Total																	
12H(7-19)	672	57	48	8	0	2	1	0	3	6	13	56	136	179	136	93	47
16H(6-22)	745	57	48	8	0	2	3	1	3	6	17	59	147	200	147	105	55
18H(6-24)	763	57	48	8	0	2	3	1	3	6	17	63	149	204	150	107	58
24H(0-24)	778	57	48	8	0	2	3	1	3	6	18	63	154	206	152	110	60
AM Peak	11:00		00:00	06:00	11:00	09:00	11:00	06:00	09:00	09:00	08:00	07:00	11:00	09:00	11:00	07:00	08:00
	55		51	11	0	1	0	1	2	2	2	6	11	20	13	8	8
PM Peak	17:00	16:00	23:00	21:00	23:00	14:00	21:00	23:00	23:00	13:00	15:00	15:00	15:00	17:00	16:00	17:00	16:00
	83	59	53	11	0	1	1	0	0	2	3	11	22	24	23	16	10

VDA-pro R2 29/01/2018

Site No. 10218001 Site Ref. 10218001
B5301 Parsonby Brow Parsonby Wigton
Speed Report (Speed Limit 60 Mph) 24 January 2018 Channel: Southbound

	Total Volume	85th %ile	Mean Ave.	Std. Dev.	Bin 1 <5MPH	Bin 2 5-<10	Bin 3 10-<15	Bin 4 15-<20	Bin 5 20-<25	Bin 6 25-<30	Bin 7 30-<35	Bin 8 35-<40	Bin 9 40-<45	Bin 10 45-<50	Bin 11 50-<55	Bin 12 55-<60	Bin 13 =>60
00:00	7		55	4	0	0	0	0	0	0	0	0	0	1	2	2	2
01:00	1		38	0	0	0	0	0	0	0	0	1	0	0	0	0	0
02:00	0				0	0	0	0	0	0	0	0	0	0	0	0	0
03:00	2		30	3	0	0	0	0	0	1	1	0	0	0	0	0	0
04:00	3		51	2	0	0	0	0	0	0	0	0	0	1	2	0	0
05:00	15	54	47	7	0	0	0	0	0	0	0	3	5	1	4	1	1
06:00	39	54	47	7	0	0	0	0	1	1	0	2	9	11	12	1	2
07:00	70	51	44	8	0	0	0	0	2	2	5	6	22	19	12	1	1
08:00	85	51	42	9	0	0	2	1	0	6	5	15	27	12	13	1	3
09:00	59	52	43	11	0	0	3	0	0	2	5	13	8	17	4	5	2
10:00	42	49	41	9	0	0	1	0	0	5	5	4	14	7	4	2	0
11:00	50	47	41	8	0	1	0	0	0	2	3	16	16	9	0	2	1
12:00	51	49	41	8	0	1	0	0	0	2	6	10	18	7	6	0	1
13:00	52	50	42	9	0	0	1	0	0	6	2	8	14	14	6	1	0
14:00	47	48	43	6	0	0	0	0	0	0	5	8	21	8	3	1	1
15:00	54	50	42	10	0	0	1	2	0	2	7	5	14	14	7	1	1
16:00	56	53	43	9	0	0	0	1	0	5	3	10	17	9	4	6	1
17:00	43	51	45	6	0	0	0	0	0	0	1	6	17	11	5	1	2
18:00	29	54	45	7	0	0	0	0	0	0	2	4	9	7	3	4	0
19:00	16	54	48	6	0	0	0	0	0	0	0	2	3	4	5	1	1
20:00	12	54	48	6	0	0	0	0	0	0	0	0	5	4	1	1	1
21:00	10	55	48	6	0	0	0	0	0	0	0	0	4	4	0	1	1
22:00	11	54	48	6	0	0	0	0	0	0	0	2	1	2	5	1	0
23:00	7		44	4	0	0	0	0	0	0	0	1	4	1	1	0	0
Total																	
12H(7-19)	638	51	43	9	0	2	8	4	2	32	49	105	197	134	67	25	13
16H(6-22)	715	51	43	9	0	2	8	4	3	33	49	109	218	157	85	29	18
18H(6-24)	733	52	43	9	0	2	8	4	3	33	49	112	223	160	91	30	18
24H(0-24)	761	52	43	9	0	2	8	4	3	34	50	116	228	163	99	33	21
AM Peak	08:00		00:00	09:00	11:00	11:00	09:00	08:00	07:00	08:00	10:00	11:00	08:00	07:00	08:00	09:00	08:00
	85		55	11	0	1	3	1	2	6	5	16	27	19	13	5	3
PM Peak	16:00	21:00	22:00	15:00	23:00	12:00	15:00	15:00	23:00	13:00	15:00	16:00	14:00	15:00	15:00	16:00	17:00
	56	55	48	10	0	1	1	2	0	6	7	10	21	14	7	6	2

VDA-pro R2 29/01/2018

Site No. 10218001 Site Ref. 10218001
B5301 Parsonby Brow Parsonby Wigton
Speed Report (Speed Limit 60 Mph) 25 January 2018 Channel: Southbound

	Total Volume	85th %ile	Mean Ave.	Std. Dev.	Bin 1 <5MPH	Bin 2 5-<10	Bin 3 10-<15	Bin 4 15-<20	Bin 5 20-<25	Bin 6 25-<30	Bin 7 30-<35	Bin 8 35-<40	Bin 9 40-<45	Bin 10 45-<50	Bin 11 50-<55	Bin 12 55-<60	Bin 13 =>60
00:00	7		50	6	0	0	0	0	0	0	0	1	0	2	3	1	0
01:00	3		34	8	0	0	0	0	1	0	0	1	1	0	0	0	0
02:00	0				0	0	0	0	0	0	0	0	0	0	0	0	0
03:00	0				0	0	0	0	0	0	0	0	0	0	0	0	0
04:00	9		51	6	0	0	0	0	0	0	0	1	1	0	5	2	0
05:00	18		50	7	0	0	0	0	0	0	0	1	3	5	4	2	3
06:00	33	57	51	5	0	0	0	0	0	0	0	1	2	14	9	5	2
07:00	70	51	44	7	0	0	0	0	1	1	5	10	26	15	9	0	3
08:00	94	52	43	8	0	1	1	0	0	1	7	18	28	20	11	5	2
09:00	60	52	44	8	0	1	0	0	1	0	1	8	22	15	8	2	2
10:00	54	50	41	9	0	0	1	0	3	5	2	8	11	17	6	1	0
11:00	51	48	43	6	0	0	0	0	0	1	5	9	20	12	2	1	1
12:00	52	47	37	10	0	0	0	2	8	0	7	16	9	4	4	1	1
13:00	60	49	39	10	1	0	1	2	1	1	13	10	15	9	6	0	1
14:00	39	51	41	10	0	1	0	0	0	4	6	4	13	3	6	2	0
15:00	46	50	44	7	0	0	0	0	1	0	4	6	13	15	4	3	0
16:00	52	54	45	7	0	0	0	0	0	1	1	12	11	13	8	6	0
17:00	47	48	41	9	0	0	1	0	0	4	6	10	13	8	2	2	1
18:00	32	54	47	6	0	0	0	0	0	0	0	3	9	11	5	3	1
19:00	18	55	46	11	0	0	0	0	2	0	1	1	3	1	7	3	0
20:00	10	55	49	7	0	0	0	0	0	0	0	2	0	3	3	2	0
21:00	6		43	22	0	0	2	0	0	0	0	0	0	0	0	2	2
22:00	12		50	8	0	0	0	0	0	0	0	1	4	1	2	2	2
23:00	3		43	4	0	0	0	0	0	0	0	1	1	1	0	0	0
Total																	
12H(7-19)	657	51	42	9	1	3	4	4	15	18	57	114	190	142	71	26	12
16H(6-22)	724	52	43	9	1	3	6	4	17	18	58	118	195	160	90	38	16
18H(6-24)	739	52	43	9	1	3	6	4	17	18	58	120	200	162	92	40	18
24H(0-24)	776	53	43	9	1	3	6	4	18	18	58	124	205	169	104	45	21
AM Peak	08:00		04:00	10:00	11:00	09:00	10:00	11:00	10:00	10:00	08:00	08:00	08:00	08:00	08:00	08:00	07:00
	94		51	9	0	1	1	0	3	5	7	18	28	20	11	5	3
PM Peak	13:00	20:00	22:00	21:00	13:00	14:00	21:00	13:00	12:00	17:00	13:00	12:00	13:00	15:00	16:00	16:00	22:00
	60	55	50	22	1	1	2	2	8	4	13	16	15	15	8	6	2

VDA-pro R2 29/01/2018

Site No. 10218001 Site Ref. 10218001
B5301 Parsonby Brow Parsonby Wigton
Speed Report (Speed Limit 60 Mph) 24 January 2018 Channel: Total Flow

	Total Volume	85th %ile	Mean Ave.	Std. Dev.	Bin 1 <5MPH	Bin 2 5-<10	Bin 3 10-<15	Bin 4 15-<20	Bin 5 20-<25	Bin 6 25-<30	Bin 7 30-<35	Bin 8 35-<40	Bin 9 40-<45	Bin 10 45-<50	Bin 11 50-<55	Bin 12 55-<60	Bin 13 =>60
00:00	7		55	4	0	0	0	0	0	0	0	0	0	1	2	2	2
01:00	1		38	0	0	0	0	0	0	0	0	1	0	0	0	0	0
02:00	1		53	0	0	0	0	0	0	0	0	0	0	0	1	0	0
03:00	3		38	11	0	0	0	0	0	1	1	0	0	0	1	0	0
04:00	4		48	6	0	0	0	0	0	0	0	1	0	1	2	0	0
05:00	25	54	47	6	0	0	0	0	0	0	0	4	7	4	8	1	1
06:00	52	54	47	8	0	0	0	0	1	1	1	4	10	15	14	3	3
07:00	100	52	44	7	0	0	0	0	2	2	7	11	28	27	20	2	1
08:00	133	53	44	9	0	0	2	1	0	8	5	18	35	28	24	6	6
09:00	101	57	46	11	0	1	3	0	0	2	5	14	14	29	14	11	8
10:00	85	54	45	9	0	0	1	0	0	5	7	7	21	18	16	7	3
11:00	84	53	44	9	0	1	0	0	0	2	4	23	21	16	6	6	5
12:00	96	54	45	9	0	1	1	0	0	2	6	14	29	17	14	4	8
13:00	106	53	45	9	0	1	1	0	0	6	2	14	25	26	21	3	7
14:00	98	52	44	8	0	0	1	0	0	1	5	19	33	19	12	5	3
15:00	130	54	46	9	0	0	1	2	0	2	7	16	21	39	26	9	7
16:00	127	57	48	9	0	0	0	1	0	5	3	14	23	27	25	19	10
17:00	144	55	48	6	0	0	0	0	0	1	1	10	40	45	26	17	4
18:00	70	57	48	7	0	0	0	0	0	0	3	5	17	14	16	12	3
19:00	48	57	48	10	0	1	0	0	0	0	1	8	6	11	11	5	5
20:00	45	58	49	7	0	0	0	0	0	0	0	3	13	10	8	7	4
21:00	28		49	8	0	0	0	0	0	0	0	2	10	6	1	2	7
22:00	17	54	48	7	0	0	0	0	0	0	0	3	3	4	5	1	1
23:00	11	53	46	8	0	0	0	0	0	0	1	1	4	1	3	0	1
Total																	
12H(7-19)	1274	54	46	9	0	4	10	4	2	36	55	165	307	305	220	101	65
16H(6-22)	1447	55	46	9	0	5	10	4	3	37	57	182	346	347	254	118	84
18H(6-24)	1475	55	46	9	0	5	10	4	3	37	58	186	353	352	262	119	86
24H(0-24)	1516	55	46	9	0	5	10	4	3	38	59	192	360	358	276	122	89
AM Peak	08:00		00:00	03:00	11:00	11:00	09:00	08:00	07:00	08:00	10:00	11:00	08:00	09:00	08:00	09:00	09:00
	133		55	11	0	1	3	1	2	8	7	23	35	29	24	11	8
PM Peak	17:00	20:00	21:00	19:00	23:00	19:00	15:00	15:00	23:00	13:00	15:00	14:00	17:00	17:00	15:00	16:00	16:00
	144	58	49	10	0	1	1	2	0	6	7	19	40	45	26	19	10

VDA-pro R2 29/01/2018

Site No. 10218001 Site Ref. 10218001
B5301 Parsonby Brow Parsonby Wigton
Speed Report (Speed Limit 60 Mph) 25 January 2018 Channel: Total Flow

	Total Volume	85th %ile	Mean Ave.	Std. Dev.	Bin 1 <5MPH	Bin 2 5-<10	Bin 3 10-<15	Bin 4 15-<20	Bin 5 20-<25	Bin 6 25-<30	Bin 7 30-<35	Bin 8 35-<40	Bin 9 40-<45	Bin 10 45-<50	Bin 11 50-<55	Bin 12 55-<60	Bin 13 =>60
00:00	11	57	50	7	0	0	0	0	0	0	0	1	2	2	3	2	1
01:00	5		38	10	0	0	0	0	1	0	1	1	1	0	1	0	0
02:00	0				0	0	0	0	0	0	0	0	0	0	0	0	0
03:00	0				0	0	0	0	0	0	0	0	0	0	0	0	0
04:00	9		51	6	0	0	0	0	0	0	0	1	1	0	5	2	0
05:00	27	59	50	7	0	0	0	0	0	0	0	1	6	7	5	4	4
06:00	48	59	50	8	0	0	0	1	0	0	0	2	4	17	9	10	5
07:00	104	54	45	8	0	0	0	0	1	1	5	16	32	22	14	8	5
08:00	146	54	45	9	0	1	1	0	0	1	9	22	37	34	21	10	10
09:00	109	54	45	9	0	2	0	0	3	2	2	12	26	35	14	8	5
10:00	97	55	45	10	0	0	1	0	3	6	2	9	20	28	14	8	6
11:00	106	54	46	7	0	0	0	0	1	1	6	11	31	29	15	8	4
12:00	90	52	41	10	0	0	0	2	8	0	8	22	16	17	9	5	3
13:00	121	51	42	9	1	0	1	2	1	3	15	20	34	23	14	5	2
14:00	94	55	45	10	0	2	0	0	0	4	7	7	24	16	21	9	4
15:00	125	54	45	8	0	0	1	0	1	0	7	17	35	32	16	13	3
16:00	133	57	49	7	0	0	0	0	0	1	3	15	23	31	31	19	10
17:00	130	56	46	8	0	0	1	0	0	5	6	12	32	32	20	18	4
18:00	74	55	48	6	0	0	0	0	0	0	0	7	16	22	18	8	3
19:00	46	55	47	10	0	0	1	0	2	0	3	1	8	11	13	6	1
20:00	24	57	48	8	0	0	0	0	0	0	2	3	2	6	5	4	2
21:00	22		47	15	0	0	3	0	0	0	0	1	2	5	3	4	4
22:00	24	58	48	8	0	0	0	0	0	0	0	4	6	4	4	3	3
23:00	9		49	8	0	0	0	0	0	0	0	2	1	2	1	1	2
Total																	
12H(7-19)	1329	54	45	9	1	5	5	4	18	24	70	170	326	321	207	119	59
16H(6-22)	1469	55	46	9	1	5	9	5	20	24	75	177	342	360	237	143	71
18H(6-24)	1502	55	46	9	1	5	9	5	20	24	75	183	349	366	242	147	76
24H(0-24)	1554	55	46	9	1	5	9	5	21	24	76	187	359	375	256	155	81
AM Peak	08:00	05:00	04:00	01:00	11:00	09:00	10:00	06:00	10:00	10:00	08:00	08:00	08:00	09:00	08:00	08:00	08:00
	146	59	51	10	0	2	1	1	3	6	9	22	37	35	21	10	10
PM Peak	16:00	22:00	23:00	21:00	13:00	14:00	21:00	13:00	12:00	17:00	13:00	12:00	15:00	17:00	14:00	16:00	16:00
	133	58	49	15	1	2	3	2	8	5	15	22	35	32	21	19	10

VDA-pro R2 29/01/2018

Site No. 10218001 Site Ref. 10218001
B5301 Parsonby Brow Parsonby Wigton
Speed Report (Speed Limit 60 Mph) 26 January 2018 Channel: Northbound

	Total Volume	85th %ile	Mean Ave.	Std. Dev.	Bin 1 <5MPH	Bin 2 5-<10	Bin 3 10-<15	Bin 4 15-<20	Bin 5 20-<25	Bin 6 25-<30	Bin 7 30-<35	Bin 8 35-<40	Bin 9 40-<45	Bin 10 45-<50	Bin 11 50-<55	Bin 12 55-<60	Bin 13 =>60
00:00	1		43	0	0	0	0	0	0	0	0	0	1	0	0	0	0
01:00	3		34	6	0	0	0	0	0	1	1	0	1	0	0	0	0
02:00	0				0	0	0	0	0	0	0	0	0	0	0	0	0
03:00	0				0	0	0	0	0	0	0	0	0	0	0	0	0
04:00	1		48	0	0	0	0	0	0	0	0	0	0	1	0	0	0
05:00	21	58	50	7	0	0	0	0	0	0	0	2	3	5	4	2	5
06:00	10	58	48	8	0	0	0	0	0	0	0	2	2	3	1	0	2
07:00	28	56	46	8	0	0	0	0	0	0	3	6	4	7	3	3	2
08:00	41	54	47	9	0	0	0	0	0	0	3	1	7	16	8	4	2
09:00	31	51	43	6	0	0	0	0	0	0	2	8	10	5	5	1	0
10:00	38	54	46	8	0	0	0	0	0	0	3	5	11	9	5	0	5
11:00	47	57	50	6	0	0	0	0	0	0	0	2	9	15	11	6	4
12:00	52	58	49	8	0	0	0	0	0	0	2	5	8	11	13	7	6
13:00	47	53	46	8	0	0	0	0	0	4	2	1	9	15	13	2	1
14:00	73	56	48	7	0	0	0	0	0	1	4	4	13	20	18	10	3
15:00	71	54	48	6	0	0	0	0	0	0	1	4	18	18	21	5	4
16:00	84	60	52	6	0	0	0	0	0	0	0	5	4	24	23	16	12
17:00	83	56	48	6	0	0	0	0	0	0	0	4	16	31	15	11	6
18:00	54	56	48	7	0	0	0	0	0	0	0	9	13	12	10	8	2
19:00	31	59	49	7	0	0	0	0	0	0	0	3	8	7	3	6	4
20:00	19	59	49	10	0	0	0	1	0	0	0	1	5	1	2	5	4
21:00	24	55	47	8	0	0	0	0	0	0	1	5	4	5	4	2	3
22:00	15		47	9	0	0	0	0	0	0	0	1	5	4	3	1	1
23:00	10	58	50	7	0	0	0	0	0	0	0	1	1	3	2	1	2
Total																	
12H(7-19)	649	56	48	7	0	1	0	1	0	5	21	56	122	183	144	71	46
16H(6-22)	733	57	48	7	0	1	0	1	0	5	22	69	137	202	155	86	55
18H(6-24)	758	57	48	7	0	1	0	1	0	5	22	74	141	208	158	89	59
24H(0-24)	784	57	48	8	0	1	0	1	0	6	23	76	146	214	163	93	61
AM Peak	11:00		05:00	08:00	11:00	08:00	11:00	11:00	11:00	01:00	10:00	09:00	10:00	08:00	11:00	11:00	10:00
	47		50	9	0	1	0	0	0	1	3	8	11	16	11	6	5
PM Peak	16:00	16:00	16:00	20:00	23:00	23:00	23:00	20:00	23:00	13:00	14:00	18:00	15:00	17:00	16:00	16:00	16:00
	84	60	52	10	0	0	0	1	0	4	4	9	18	31	23	16	12

VDA-pro R2 29/01/2018

Site No. 10218001 Site Ref. 10218001
B5301 Parsonby Brow Parsonby Wigton
Speed Report (Speed Limit 60 Mph) 27 January 2018 Channel: Northbound

	Total Volume	85th %ile	Mean Ave.	Std. Dev.	Bin 1 <5MPH	Bin 2 5-<10	Bin 3 10-<15	Bin 4 15-<20	Bin 5 20-<25	Bin 6 25-<30	Bin 7 30-<35	Bin 8 35-<40	Bin 9 40-<45	Bin 10 45-<50	Bin 11 50-<55	Bin 12 55-<60	Bin 13 =>60
00:00	6		53	7	0	0	0	0	0	0	0	0	1	0	1	1	3
01:00	3		46	5	0	0	0	0	0	0	0	1	0	2	0	0	0
02:00	8		56	4	0	0	0	0	0	0	0	0	0	1	1	4	2
03:00	0				0	0	0	0	0	0	0	0	0	0	0	0	0
04:00	1		38	0	0	0	0	0	0	0	0	1	0	0	0	0	0
05:00	8		43	6	0	0	0	0	0	0	1	2	1	3	1	0	0
06:00	4		51	7	0	0	0	0	0	0	0	0	1	1	1	1	0
07:00	7		46	7	0	0	0	0	0	0	0	2	2	1	1	0	1
08:00	20		50	8	0	0	0	0	0	0	0	2	6	1	6	3	2
09:00	15	54	47	7	0	0	0	0	0	0	1	1	3	5	3	2	0
10:00	34	54	48	6	0	0	0	0	0	0	0	4	8	9	9	2	2
11:00	38	59	50	9	0	0	0	0	0	0	2	2	6	8	8	7	5
12:00	52	57	48	8	0	0	0	0	0	5	1	3	4	16	12	6	5
13:00	54	58	48	8	0	0	0	0	0	0	1	2	12	21	14	4	0
14:00	50	60	51	7	0	0	0	0	0	0	0	5	6	10	9	13	7
15:00	54	59	51	5	0	0	0	0	0	0	1	0	10	13	10	14	6
16:00	44	60	52	7	0	0	0	0	0	0	0	0	7	9	10	12	6
17:00	39	56	50	6	0	0	0	0	0	0	0	1	5	14	11	6	2
18:00	30	55	48	6	0	0	0	0	0	0	0	3	8	11	3	3	2
19:00	22	54	48	8	0	0	0	0	0	0	0	2	4	9	4	2	1
20:00	20	56	48	7	0	0	0	0	0	0	0	2	5	5	4	3	1
21:00	21	52	46	6	0	0	0	0	0	0	0	3	7	4	2	2	3
22:00	15		54	6	0	0	0	0	0	0	0	0	2	3	2	4	4
23:00	3		50	7	0	0	0	0	0	0	0	0	1	1	0	0	1
Total																	
12H(7-19)	437	58	50	7	0	0	0	0	0	6	5	25	77	118	93	72	41
16H(6-22)	501	58	49	7	0	0	0	0	0	6	5	32	94	137	104	79	44
18H(6-24)	519	58	49	7	0	0	0	0	0	6	5	32	97	141	106	83	49
24H(0-24)	545	58	49	7	0	0	0	0	0	6	6	36	100	147	108	88	54
AM Peak	11:00		02:00	00:00	11:00	11:00	11:00	11:00	11:00	11:00	11:00	10:00	10:00	10:00	10:00	11:00	11:00
	38		56	7	0	0	0	0	0	0	2	4	8	9	9	7	5
PM Peak	15:00	14:00	22:00	12:00	23:00	23:00	23:00	23:00	23:00	12:00	15:00	14:00	13:00	13:00	13:00	15:00	14:00
	54	60	54	8	0	0	0	0	0	5	1	5	12	21	14	14	7

VDA-pro R2 29/01/2018

Site No. 10218001 Site Ref. 10218001
B5301 Parsonby Brow Parsonby Wigton
Speed Report (Speed Limit 60 Mph) 26 January 2018 Channel: Southbound

	Total Volume	85th %ile	Mean Ave.	Std. Dev.	Bin 1 <5MPH	Bin 2 5-<10	Bin 3 10-<15	Bin 4 15-<20	Bin 5 20-<25	Bin 6 25-<30	Bin 7 30-<35	Bin 8 35-<40	Bin 9 40-<45	Bin 10 45-<50	Bin 11 50-<55	Bin 12 55-<60	Bin 13 =>60
00:00	8		44	8	0	0	0	0	0	0	1	2	2	1	1	1	0
01:00	1		28	0	0	0	0	0	0	1	0	0	0	0	0	0	0
02:00	1		43	0	0	0	0	0	0	0	0	0	1	0	0	0	0
03:00	1		33	0	0	0	0	0	0	0	1	0	0	0	0	0	0
04:00	2		55	3	0	0	0	0	0	0	0	0	0	0	1	1	0
05:00	11	58	50	7	0	0	0	0	0	0	0	0	3	4	0	3	1
06:00	36	55	49	5	0	0	0	0	0	0	0	1	9	10	11	5	0
07:00	76	52	43	9	1	0	0	0	0	3	8	11	15	20	16	2	0
08:00	81	50	43	9	0	2	0	0	0	4	9	8	23	22	8	3	2
09:00	52	51	43	9	0	1	0	0	1	0	3	11	13	14	6	2	1
10:00	43	52	44	8	0	0	0	1	0	0	3	7	13	9	7	2	1
11:00	54	50	43	7	0	0	0	0	0	0	7	9	20	9	6	3	0
12:00	44	50	42	9	0	0	0	0	1	6	2	7	12	9	5	1	1
13:00	84	55	45	10	0	0	0	1	3	4	2	13	19	15	15	8	4
14:00	57	50	44	5	0	0	0	0	0	0	0	12	24	12	7	2	0
15:00	51	53	43	11	0	0	0	2	5	0	1	6	12	11	10	3	1
16:00	51	52	44	8	0	0	0	0	0	1	6	7	11	15	7	3	1
17:00	49	50	44	7	0	0	0	0	0	2	4	5	19	11	5	1	2
18:00	49	54	46	8	0	0	0	0	0	0	4	7	12	13	7	2	4
19:00	26	53	45	7	0	0	0	0	0	0	1	4	11	4	3	2	1
20:00	9		46	10	0	0	0	0	0	1	1	0	1	1	4	1	0
21:00	19	48	45	7	0	0	0	0	0	0	1	2	10	3	1	0	2
22:00	4		50	3	0	0	0	0	0	0	0	0	0	2	2	0	0
23:00	6		48	7	0	0	0	0	0	0	0	1	1	2	1	0	1
Total																	
12H(7-19)	691	52	44	8	1	3	0	4	10	23	46	103	193	160	99	32	17
16H(6-22)	781	53	44	8	1	3	0	4	10	24	49	110	224	178	118	40	20
18H(6-24)	791	53	44	8	1	3	0	4	10	24	49	111	225	182	121	40	21
24H(0-24)	815	53	44	8	1	3	0	4	10	25	51	113	231	187	123	45	22
AM Peak	08:00		04:00	08:00	07:00	08:00	11:00	10:00	09:00	08:00	08:00	09:00	08:00	08:00	07:00	06:00	08:00
	81		55	9	1	2	0	1	1	4	9	11	23	22	16	5	2
PM Peak	13:00	13:00	22:00	15:00	23:00	23:00	23:00	15:00	15:00	12:00	16:00	13:00	14:00	16:00	13:00	13:00	18:00
	84	55	50	11	0	0	0	2	5	6	6	13	24	15	15	8	4

VDA-pro R2 29/01/2018

Site No. 10218001 Site Ref. 10218001
B5301 Parsonby Brow Parsonby Wigton
Speed Report (Speed Limit 60 Mph) 27 January 2018 Channel: Southbound

	Total Volume	85th %ile	Mean Ave.	Std. Dev.	Bin 1 <5MPH	Bin 2 5-<10	Bin 3 10-<15	Bin 4 15-<20	Bin 5 20-<25	Bin 6 25-<30	Bin 7 30-<35	Bin 8 35-<40	Bin 9 40-<45	Bin 10 45-<50	Bin 11 50-<55	Bin 12 55-<60	Bin 13 =>60
00:00	2		53	7	0	0	0	0	0	0	0	0	0	0	2	0	0
01:00	2		51	9	0	0	0	0	0	0	0	0	0	1	0	0	1
02:00	4		35	13	0	0	0	1	0	1	0	0	1	0	1	0	0
03:00	0				0	0	0	0	0	0	0	0	0	0	0	0	0
04:00	2		54	6	0	0	0	0	0	0	0	0	0	1	0	0	1
05:00	7		46	7	0	0	0	0	0	0	0	0	1	3	1	1	1
06:00	16	50	45	6	0	0	0	0	0	0	0	4	4	5	2	1	0
07:00	17	55	48	5	0	0	0	0	0	0	2	1	3	3	5	3	0
08:00	34	51	46	5	0	0	0	0	0	0	1	3	10	14	4	2	0
09:00	41	53	46	6	0	0	0	0	0	0	1	3	15	13	4	4	1
10:00	58	54	46	8	0	0	0	0	0	2	2	8	14	15	11	3	3
11:00	42	53	47	5	0	0	0	0	0	0	0	1	17	12	9	3	0
12:00	47	50	44	7	0	0	0	0	0	2	2	7	15	13	5	3	0
13:00	60	52	45	8	0	0	0	0	0	0	0	7	28	11	13	1	0
14:00	36	52	45	8	0	0	0	1	0	0	3	3	11	10	6	1	1
15:00	27	49	43	5	0	0	0	0	0	0	6	2	7	9	3	0	0
16:00	27	55	48	6	0	0	0	0	0	0	0	2	6	9	6	3	1
17:00	27	50	44	7	0	0	0	0	0	1	0	8	6	8	1	3	0
18:00	42	56	48	7	0	0	0	0	0	0	1	3	12	8	10	6	2
19:00	16	49	46	5	0	0	0	0	0	0	0	2	4	9	0	1	0
20:00	10		48	9	0	0	0	0	0	0	0	2	3	2	0	0	3
21:00	12	53	46	7	0	0	0	0	0	0	0	3	3	2	3	1	0
22:00	11		48	8	0	0	0	0	0	0	0	1	4	2	1	1	2
23:00	16	49	45	5	0	0	0	0	0	0	1	0	8	5	1	1	0
Total																	
12H(7-19)	458	53	46	7	0	0	0	1	0	5	18	48	144	125	77	32	8
16H(6-22)	512	53	46	7	0	0	0	1	0	5	18	59	158	143	82	35	11
18H(6-24)	539	53	46	7	0	0	0	1	0	5	19	60	170	150	84	37	13
24H(0-24)	556	53	46	7	0	0	0	2	0	6	19	61	175	152	88	37	16
AM Peak	10:00		04:00	02:00	11:00	11:00	11:00	02:00	11:00	10:00	10:00	10:00	11:00	10:00	10:00	09:00	10:00
	58		54	13	0	0	0	1	0	2	2	8	17	15	11	4	3
PM Peak	13:00	18:00	22:00	20:00	23:00	23:00	23:00	14:00	23:00	12:00	15:00	17:00	13:00	12:00	13:00	18:00	20:00
	60	56	48	8	0	0	0	1	0	2	6	8	28	13	13	6	3

VDA-pro R2 29/01/2018

Site No. 10218001 Site Ref. 10218001
B5301 Parsonby Brow Parsonby Wigton
Speed Report (Speed Limit 60 Mph) 26 January 2018 Channel: Total Flow

	Total Volume	85th %ile	Mean Ave.	Std. Dev.	Bin 1 <5MPH	Bin 2 5-<10	Bin 3 10-<15	Bin 4 15-<20	Bin 5 20-<25	Bin 6 25-<30	Bin 7 30-<35	Bin 8 35-<40	Bin 9 40-<45	Bin 10 45-<50	Bin 11 50-<55	Bin 12 55-<60	Bin 13 =>60
00:00	9		44	7	0	0	0	0	0	0	1	2	3	1	1	1	0
01:00	4		33	6	0	0	0	0	0	2	1	0	1	0	0	0	0
02:00	1		43	0	0	0	0	0	0	0	0	0	1	0	0	0	0
03:00	1		33	0	0	0	0	0	0	0	1	0	0	0	0	0	0
04:00	3		53	4	0	0	0	0	0	0	0	0	0	1	1	1	0
05:00	32	58	50	7	0	0	0	0	0	0	0	2	6	9	5	7	3
06:00	46	55	49	6	0	0	0	0	0	0	0	3	11	12	12	7	1
07:00	104	53	44	9	1	0	0	0	0	3	11	17	19	27	19	5	2
08:00	122	52	44	8	0	3	0	0	0	4	12	9	30	38	16	7	3
09:00	83	51	43	8	0	1	0	0	1	0	5	19	23	19	11	3	1
10:00	81	53	45	8	0	0	0	1	0	3	3	12	24	18	12	2	6
11:00	101	54	46	7	0	0	0	0	0	0	7	11	29	24	17	9	4
12:00	96	55	46	9	0	0	0	0	1	6	4	12	20	20	18	8	7
13:00	131	54	45	9	0	0	0	1	3	8	4	14	28	30	28	10	5
14:00	130	54	46	7	0	0	0	1	0	0	4	16	37	32	25	12	3
15:00	122	54	46	9	0	0	0	2	5	0	2	10	30	29	31	8	5
16:00	135	58	49	8	0	0	0	0	0	1	6	12	15	39	30	19	13
17:00	132	54	47	8	0	0	0	0	0	2	5	11	35	42	19	10	8
18:00	103	55	47	7	0	0	0	0	0	0	4	16	25	25	17	10	6
19:00	57	57	47	7	0	0	0	0	0	0	1	7	19	11	6	8	5
20:00	28	58	48	10	0	0	0	1	0	1	1	3	2	6	6	2	6
21:00	43	54	46	7	0	0	0	0	0	0	2	7	14	8	6	2	4
22:00	19		48	8	0	0	0	0	0	0	0	4	3	5	3	1	3
23:00	16	58	49	7	0	0	0	0	0	0	0	2	2	5	3	2	2
Total																	
12H(7-19)	1340	54	46	8	1	4	0	4	10	28	67	159	315	343	243	103	63
16H(6-22)	1514	55	46	8	1	4	0	5	10	29	71	179	361	380	273	126	75
18H(6-24)	1549	55	46	8	1	4	0	5	10	29	71	185	366	390	279	129	80
24H(0-24)	1599	55	46	8	1	4	0	5	10	31	74	189	377	401	286	138	83
AM Peak	08:00		04:00	08:00	07:00	08:00	11:00	10:00	09:00	08:00	08:00	09:00	08:00	08:00	07:00	11:00	10:00
	122		53	9	1	3	0	1	1	4	12	19	30	38	19	9	6
PM Peak	16:00	16:00	23:00	20:00	23:00	23:00	23:00	15:00	15:00	13:00	16:00	18:00	14:00	17:00	15:00	16:00	16:00
	135	58	49	10	0	0	0	2	5	8	6	16	37	42	31	19	13

VDA-pro R2 29/01/2018

Site No. 10218001 Site Ref. 10218001
B5301 Parsonby Brow Parsonby Wigton
Speed Report (Speed Limit 60 Mph) 27 January 2018 Channel: Total Flow

	Total Volume	85th %ile	Mean Ave.	Std. Dev.	Bin 1 <5MPH	Bin 2 5-<10	Bin 3 10-<15	Bin 4 15-<20	Bin 5 20-<25	Bin 6 25-<30	Bin 7 30-<35	Bin 8 35-<40	Bin 9 40-<45	Bin 10 45-<50	Bin 11 50-<55	Bin 12 55-<60	Bin 13 =>60
00:00	8		53	8	0	0	0	0	0	0	0	1	1	0	2	1	3
01:00	5		48	6	0	0	0	0	0	0	0	0	2	2	0	0	1
02:00	12		49	13	0	0	0	1	0	1	0	0	1	1	2	4	2
03:00	0				0	0	0	0	0	0	0	0	0	0	0	0	0
04:00	3		48	9	0	0	0	0	0	0	0	1	0	1	0	0	1
05:00	15	51	45	7	0	0	0	0	0	0	1	3	4	4	2	0	1
06:00	20	53	46	6	0	0	0	0	0	0	0	4	5	6	3	1	1
07:00	24	55	47	7	0	0	0	0	0	0	2	3	5	4	6	3	1
08:00	54	56	48	7	0	0	0	0	0	0	1	5	16	15	7	5	5
09:00	56	54	47	6	0	0	0	0	0	0	2	4	18	18	7	6	1
10:00	92	54	47	7	0	0	0	0	0	2	2	12	22	24	20	5	5
11:00	80	56	48	7	0	0	0	0	0	0	2	3	23	20	17	10	5
12:00	99	55	46	8	0	0	0	0	0	7	3	10	19	29	17	9	5
13:00	114	53	47	5	0	0	0	0	0	0	0	9	40	32	27	5	1
14:00	86	58	48	8	0	0	0	1	0	0	3	8	17	20	15	14	8
15:00	81	57	48	8	0	0	0	0	0	1	7	2	17	22	13	14	5
16:00	71	59	51	6	0	0	0	0	0	0	0	2	13	18	16	15	7
17:00	66	55	48	7	0	0	0	0	0	1	0	9	11	22	12	9	2
18:00	72	56	48	7	0	0	0	0	0	0	1	6	20	19	13	9	4
19:00	38	52	47	6	0	0	0	0	0	0	0	4	8	18	4	3	1
20:00	30	58	48	9	0	0	0	0	0	0	0	4	8	7	4	3	4
21:00	30	53	46	6	0	0	0	0	0	0	0	6	10	6	5	3	0
22:00	26		51	6	0	0	0	0	0	0	0	1	6	5	3	5	6
23:00	19	48	46	5	0	0	0	0	0	0	1	0	9	6	1	1	1
Total																	
12H(7-19)	895	56	48	7	0	0	0	1	0	11	23	73	221	243	170	104	49
16H(6-22)	1013	56	48	7	0	0	0	1	0	11	23	91	252	280	186	114	55
18H(6-24)	1058	56	48	7	0	0	0	1	0	11	24	92	267	291	190	120	62
24H(0-24)	1101	56	48	7	0	0	0	2	0	12	25	97	275	299	196	125	70
AM Peak	10:00		00:00	02:00	11:00	11:00	11:00	02:00	11:00	10:00	11:00	10:00	11:00	10:00	10:00	11:00	11:00
	92		53	13	0	0	0	1	0	2	2	12	23	24	20	10	5
PM Peak	13:00	16:00	22:00	12:00	23:00	23:00	23:00	14:00	23:00	12:00	15:00	12:00	13:00	13:00	13:00	16:00	14:00
	114	59	51	8	0	0	0	1	0	7	7	10	40	32	27	15	8

VDA-pro R2 29/01/2018

Site No. 10218001 Site Ref. 10218001
B5301 Parsonby Brow Parsonby Wigton
Speed Report (Speed Limit 60 Mph) 28 January 2018 Channel: Northbound

	Total Volume	85th %ile	Mean Ave.	Std. Dev.	Bin 1 <5MPH	Bin 2 5-<10	Bin 3 10-<15	Bin 4 15-<20	Bin 5 20-<25	Bin 6 25-<30	Bin 7 30-<35	Bin 8 35-<40	Bin 9 40-<45	Bin 10 45-<50	Bin 11 50-<55	Bin 12 55-<60	Bin 13 =>60
00:00	5		51	2	0	0	0	0	0	0	0	0	0	2	3	0	0
01:00	6		54	4	0	0	0	0	0	0	0	0	0	1	2	3	0
02:00	3		48	11	0	0	0	0	0	0	1	0	0	0	1	1	0
03:00	2		53	5	0	0	0	0	0	0	0	0	0	1	0	1	0
04:00	2		45	3	0	0	0	0	0	0	0	0	1	1	0	0	0
05:00	4		39	8	0	0	0	0	0	0	2	1	0	0	1	0	0
06:00	5		41	2	0	0	0	0	0	0	0	2	3	0	0	0	0
07:00	2		48	0	0	0	0	0	0	0	0	0	0	2	0	0	0
08:00	10		52	7	0	0	0	0	0	0	0	0	3	0	4	0	3
09:00	19	58	50	8	0	0	0	0	0	1	0	2	0	5	6	3	2
10:00	16	57	50	6	0	0	0	0	0	0	0	0	4	3	5	3	1
11:00	28	57	50	7	0	0	0	0	0	0	0	0	1	9	10	3	5
12:00	50	58	51	8	0	0	0	0	0	1	1	3	7	5	18	11	4
13:00	45	56	50	5	0	0	0	0	0	0	0	0	8	17	11	9	0
14:00	41	58	51	6	0	0	0	0	0	0	0	1	6	10	12	9	3
15:00	39	59	52	5	0	0	0	0	0	0	0	0	5	5	17	7	5
16:00	48	57	50	6	0	0	0	0	0	0	0	1	12	11	14	5	5
17:00	33		48	11	1	0	0	0	0	0	0	5	4	6	10	2	5
18:00	20	59	53	5	0	0	0	0	0	0	0	0	0	9	3	6	2
19:00	18	58	50	6	0	0	0	0	0	0	0	0	6	3	4	3	2
20:00	12	54	46	9	0	0	0	0	0	1	0	1	5	0	3	1	1
21:00	12	54	52	4	0	0	0	0	0	0	0	0	1	2	7	2	0
22:00	3		44	6	0	0	0	0	0	0	0	1	1	0	1	0	0
23:00	4		56	5	0	0	0	0	0	0	0	0	0	1	1	2	0
Total																	
12H(7-19)	351	58	51	7	1	0	0	0	0	3	1	13	50	82	110	58	33
16H(6-22)	398	58	50	7	1	0	0	0	0	4	1	16	65	87	124	64	36
18H(6-24)	405	58	50	7	1	0	0	0	0	4	1	17	66	88	125	66	37
24H(0-24)	427	58	50	7	1	0	0	0	0	4	4	18	67	93	132	71	37
AM Peak	11:00		01:00	02:00	11:00	11:00	11:00	11:00	11:00	09:00	05:00	09:00	10:00	11:00	11:00	11:00	11:00
	28		54	11	0	0	0	0	0	1	2	2	4	9	10	3	5
PM Peak	12:00	15:00	23:00	17:00	17:00	23:00	23:00	23:00	23:00	20:00	12:00	17:00	16:00	13:00	12:00	12:00	17:00
	50	59	56	11	1	0	0	0	0	1	1	5	12	17	18	11	5

VDA-pro R2 29/01/2018

Site No. 10218001 Site Ref. 10218001
B5301 Parsonby Brow Parsonby Wigton
Speed Report (Speed Limit 60 Mph) 28 January 2018 Channel: Southbound

	Total Volume	85th %ile	Mean Ave.	Std. Dev.	Bin 1 <5MPH	Bin 2 5-<10	Bin 3 10-<15	Bin 4 15-<20	Bin 5 20-<25	Bin 6 25-<30	Bin 7 30-<35	Bin 8 35-<40	Bin 9 40-<45	Bin 10 45-<50	Bin 11 50-<55	Bin 12 55-<60	Bin 13 =>60
00:00	0				0	0	0	0	0	0	0	0	0	0	0	0	0
01:00	1		60	0	0	0	0	0	0	0	0	0	0	0	0	0	1
02:00	3		54	2	0	0	0	0	0	0	0	0	0	0	2	1	0
03:00	0				0	0	0	0	0	0	0	0	0	0	0	0	0
04:00	4		46	7	0	0	0	0	0	0	0	1	1	1	0	1	0
05:00	7		49	7	0	0	0	0	0	0	0	0	3	2	0	1	1
06:00	9		44	3	0	0	0	0	0	0	0	1	5	3	0	0	0
07:00	15	55	46	7	0	0	0	0	0	0	0	5	3	3	1	3	0
08:00	12	54	49	5	0	0	0	0	0	0	0	1	2	3	5	1	0
09:00	29	50	44	7	0	0	0	0	1	0	2	4	8	9	4	1	0
10:00	50	53	44	8	0	0	0	0	2	2	1	7	14	9	12	2	1
11:00	40	52	47	6	0	0	0	0	0	0	1	3	11	17	4	2	2
12:00	51	50	45	5	0	0	0	0	0	0	1	7	15	21	6	0	1
13:00	40	53	46	7	0	0	0	0	0	0	1	11	5	10	10	2	1
14:00	24	55	47	7	0	0	0	0	0	0	2	2	3	9	4	3	1
15:00	30	52	47	6	0	0	0	0	0	0	0	6	2	15	5	2	0
16:00	27	50	43	7	0	0	0	1	0	0	1	6	9	6	4	0	0
17:00	18	52	46	7	0	0	0	0	0	0	1	4	2	6	4	0	1
18:00	18	55	47	6	0	0	0	0	0	0	0	2	7	5	1	2	1
19:00	14	56	47	8	0	0	0	0	0	0	0	4	1	5	1	2	1
20:00	3		49	6	0	0	0	0	0	0	0	0	1	1	0	1	0
21:00	11	53	48	6	0	0	0	0	0	0	0	0	5	2	3	0	1
22:00	5		54	4	0	0	0	0	0	0	0	0	0	1	2	1	1
23:00	7		48	7	0	0	0	0	0	0	0	1	1	3	1	0	1
Total																	
12H(7-19)	354	53	46	7	0	0	0	1	3	2	10	58	81	113	60	18	8
16H(6-22)	391	53	46	7	0	0	0	1	3	2	10	63	93	124	64	21	10
18H(6-24)	403	53	46	7	0	0	0	1	3	2	10	64	94	128	67	22	12
24H(0-24)	418	53	46	7	0	0	0	1	3	2	10	65	98	131	69	25	14
AM Peak	10:00				11:00	11:00	11:00	11:00	10:00	10:00	09:00	10:00	10:00	11:00	10:00	07:00	11:00
	50				0	0	0	0	2	2	2	7	14	17	12	3	2
PM Peak	12:00	19:00	22:00	19:00	23:00	23:00	23:00	16:00	23:00	23:00	14:00	13:00	12:00	12:00	13:00	14:00	23:00
	51	56	54	8	0	0	0	1	0	0	2	11	15	21	10	3	1

VDA-pro R2 29/01/2018

Site No. 10218001 Site Ref. 10218001
B5301 Parsonby Brow Parsonby Wigton
Speed Report (Speed Limit 60 Mph) 28 January 2018 Channel: Total Flow

	Total Volume	85th %ile	Mean Ave.	Std. Dev.	Bin 1 <5MPH	Bin 2 5-<10	Bin 3 10-<15	Bin 4 15-<20	Bin 5 20-<25	Bin 6 25-<30	Bin 7 30-<35	Bin 8 35-<40	Bin 9 40-<45	Bin 10 45-<50	Bin 11 50-<55	Bin 12 55-<60	Bin 13 =>60
00:00	5		51	2	0	0	0	0	0	0	0	0	0	2	3	0	0
01:00	7		55	4	0	0	0	0	0	0	0	0	0	1	2	3	1
02:00	6		51	8	0	0	0	0	0	0	1	0	0	0	3	2	0
03:00	2		53	5	0	0	0	0	0	0	0	0	0	1	0	1	0
04:00	6		46	6	0	0	0	0	0	0	0	1	2	2	0	1	0
05:00	11	54	45	9	0	0	0	0	0	0	2	1	3	2	1	1	1
06:00	14	46	43	3	0	0	0	0	0	0	0	3	8	3	0	0	0
07:00	17	55	46	7	0	0	0	0	0	0	0	5	3	5	1	3	0
08:00	22	56	50	6	0	0	0	0	0	0	0	1	5	3	9	1	3
09:00	48	54	46	8	0	0	0	0	1	1	2	6	8	14	10	4	2
10:00	66	54	46	8	0	0	0	0	2	2	1	7	18	12	17	5	2
11:00	68	55	48	7	0	0	0	0	0	1	1	4	12	26	14	5	5
12:00	101	55	48	7	0	0	0	0	0	1	2	10	22	26	24	11	5
13:00	85	55	48	6	0	0	0	0	0	0	1	11	13	27	21	11	1
14:00	65	57	50	7	0	0	0	0	0	0	2	3	9	19	16	12	4
15:00	69	57	50	6	0	0	0	0	0	0	0	6	7	20	22	9	5
16:00	75	55	47	7	0	0	0	1	0	0	1	7	21	17	18	5	5
17:00	51	55	47	10	1	0	0	0	0	0	1	9	6	12	14	2	6
18:00	38	58	50	6	0	0	0	0	0	0	0	2	7	14	4	8	3
19:00	32	58	49	7	0	0	0	0	0	0	0	4	7	8	5	5	3
20:00	15	56	47	8	0	0	0	0	0	1	0	1	6	1	3	2	1
21:00	23	55	50	5	0	0	0	0	0	0	0	0	6	4	10	2	1
22:00	8		50	7	0	0	0	0	0	0	0	1	1	1	3	1	1
23:00	11		51	7	0	0	0	0	0	0	0	1	1	4	1	2	2
Total																	
12H(7-19)	705	56	48	7	1	0	0	1	3	5	11	71	131	195	170	76	41
16H(6-22)	789	56	48	7	1	0	0	1	3	6	11	79	158	211	188	85	46
18H(6-24)	808	56	48	7	1	0	0	1	3	6	11	81	160	216	192	88	49
24H(0-24)	845	56	48	7	1	0	0	1	3	6	14	83	165	224	201	96	51
AM Peak	11:00		01:00	05:00	11:00	11:00	11:00	11:00	10:00	10:00	09:00	10:00	10:00	11:00	10:00	11:00	11:00
	68		55	9	0	0	0	0	2	2	2	7	18	26	17	5	5
PM Peak	12:00	18:00	23:00	17:00	17:00	23:00	23:00	16:00	23:00	20:00	14:00	13:00	12:00	13:00	12:00	14:00	17:00
	101	58	51	10	1	0	0	1	0	1	2	11	22	27	24	12	6

VDA-pro R2 29/01/2018

Site No. 10218001 Site Ref. 10218001
B5301 Parsonby Brow Parsonby Wigton
Classification Report (Euro 13) 22 January 2018 Channel: Northbound

	Total Volume	Bin 1 Cr/LVn+T	Bin 2 2AxRg	Bin 3 3AxRg	Bin 4 4AxRg	Bin 5 2AxRg+Tr	Bin 6 3AxRg+Tr	Bin 7 Artic2Ax	Bin 8 Artic2Ax	Bin 9 Artic2Ax	Bin 10 Artic3Ax	Bin 11 Artic3Ax	Bin 12 2/3AxBus	Bin 13 >=7Ax/Un
00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:00	2	2	0	0	0	0	0	0	0	0	0	0	0	0
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00	1	1	0	0	0	0	0	0	0	0	0	0	0	0
04:00	2	2	0	0	0	0	0	0	0	0	0	0	0	0
05:00	11	11	0	0	0	0	0	0	0	0	0	0	0	0
06:00	16	16	0	0	0	0	0	0	0	0	0	0	0	0
07:00	31	27	2	0	0	0	0	0	0	1	0	1	0	0
08:00	45	40	3	0	0	0	0	0	0	0	0	0	2	0
09:00	30	23	2	0	1	0	0	0	0	2	0	2	0	0
10:00	36	34	0	1	1	0	0	0	0	0	0	0	0	0
11:00	45	36	4	0	3	0	0	0	0	0	0	1	1	0
12:00	44	40	1	0	1	0	0	0	0	1	0	1	0	0
13:00	47	41	0	0	4	0	0	0	0	0	0	0	2	0
14:00	45	43	0	0	2	0	0	0	0	0	0	0	0	0
15:00	64	61	0	0	1	0	0	0	1	1	0	0	0	0
16:00	84	80	1	1	0	0	0	0	0	1	1	0	0	0
17:00	78	77	1	0	0	0	0	0	0	0	0	0	0	0
18:00	54	54	0	0	0	0	0	0	0	0	0	0	0	0
19:00	19	18	0	0	1	0	0	0	0	0	0	0	0	0
20:00	24	22	0	0	2	0	0	0	0	0	0	0	0	0
21:00	9	7	0	0	2	0	0	0	0	0	0	0	0	0
22:00	10	9	0	0	1	0	0	0	0	0	0	0	0	0
23:00	2	1	0	0	1	0	0	0	0	0	0	0	0	0
Total														
12H(7-19)	603	556	14	2	13	0	0	0	1	6	1	5	5	0
16H(6-22)	671	619	14	2	18	0	0	0	1	6	1	5	5	0
18H(6-24)	683	629	14	2	20	0	0	0	1	6	1	5	5	0
24H(0-24)	699	645	14	2	20	0	0	0	1	6	1	5	5	0
AM Peak	11:00	08:00	11:00	10:00	11:00	11:00	11:00	11:00	11:00	09:00	11:00	09:00	08:00	11:00
	45	40	4	1	3	0	0	0	0	2	0	2	2	0
PM Peak	16:00	16:00	17:00	16:00	13:00	23:00	23:00	23:00	15:00	16:00	16:00	12:00	13:00	23:00
	84	80	1	1	4	0	0	0	1	1	1	1	2	0

VDA-pro R2 30/01/2018

Site No. 10218001 Site Ref. 10218001
B5301 Parsonby Brow Parsonby Wigton
Classification Report (Euro 13) 23 January 2018 Channel: Northbound

	Total Volume	Bin 1 Cr/LVn+T	Bin 2 2AxRg	Bin 3 3AxRg	Bin 4 4AxRg	Bin 5 2AxRg+Tr	Bin 6 3AxRg+Tr	Bin 7 Artic2Ax	Bin 8 Artic2Ax	Bin 9 Artic2Ax	Bin 10 Artic3Ax	Bin 11 Artic3Ax	Bin 12 2/3AxBus	Bin 13 >=7Ax/Un
00:00	3	1	1	0	1	0	0	0	0	0	0	0	0	0
01:00	2	1	0	0	1	0	0	0	0	0	0	0	0	0
02:00	2	2	0	0	0	0	0	0	0	0	0	0	0	0
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00	12	12	0	0	0	0	0	0	0	0	0	0	0	0
06:00	14	14	0	0	0	0	0	0	0	0	0	0	0	0
07:00	30	27	0	0	1	0	0	0	0	1	0	0	1	0
08:00	51	43	2	0	1	0	0	0	0	0	0	0	5	0
09:00	47	45	1	0	1	0	0	0	0	0	0	0	0	0
10:00	33	30	2	0	0	0	0	0	0	0	0	1	0	0
11:00	33	26	4	0	0	0	0	0	1	1	0	1	0	0
12:00	39	34	0	0	2	0	0	0	0	1	0	0	2	0
13:00	50	46	3	0	1	0	0	0	0	0	0	0	0	0
14:00	50	45	0	0	1	0	0	0	1	2	0	1	0	0
15:00	72	64	0	0	5	0	0	0	0	0	0	2	1	0
16:00	77	77	0	0	0	0	0	0	0	0	0	0	0	0
17:00	84	79	3	0	1	0	0	0	0	1	0	0	0	0
18:00	59	57	1	0	0	0	0	0	0	0	0	1	0	0
19:00	22	22	0	0	0	0	0	0	0	0	0	0	0	0
20:00	21	18	0	0	3	0	0	0	0	0	0	0	0	0
21:00	15	14	0	0	1	0	0	0	0	0	0	0	0	0
22:00	10	10	0	0	0	0	0	0	0	0	0	0	0	0
23:00	1	1	0	0	0	0	0	0	0	0	0	0	0	0
Total														
12H(7-19)	625	573	16	0	13	0	0	0	2	6	0	6	9	0
16H(6-22)	697	641	16	0	17	0	0	0	2	6	0	6	9	0
18H(6-24)	708	652	16	0	17	0	0	0	2	6	0	6	9	0
24H(0-24)	727	668	17	0	19	0	0	0	2	6	0	6	9	0
AM Peak	08:00	09:00	11:00	11:00	09:00	11:00	11:00	11:00	11:00	11:00	11:00	11:00	08:00	11:00
	51	45	4	0	1	0	0	0	1	1	0	1	5	0
PM Peak	17:00	17:00	17:00	23:00	15:00	23:00	23:00	23:00	14:00	14:00	23:00	15:00	12:00	23:00
	84	79	3	0	5	0	0	0	1	2	0	2	2	0

VDA-pro R2 30/01/2018

Site No. 10218001 Site Ref. 10218001
B5301 Parsonby Brow Parsonby Wigton
Classification Report (Euro 13) 22 January 2018 Channel: Southbound

	Total Volume	Bin 1 Cr/LVn+T	Bin 2 2AxRg	Bin 3 3AxRg	Bin 4 4AxRg	Bin 5 2AxRg+Tr	Bin 6 3AxRg+Tr	Bin 7 Artic2Ax	Bin 8 Artic2Ax	Bin 9 Artic2Ax	Bin 10 Artic3Ax	Bin 11 Artic3Ax	Bin 12 2/3AxBus	Bin 13 >=7Ax/Un
00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:00	1	1	0	0	0	0	0	0	0	0	0	0	0	0
02:00	1	1	0	0	0	0	0	0	0	0	0	0	0	0
03:00	4	4	0	0	0	0	0	0	0	0	0	0	0	0
04:00	11	11	0	0	0	0	0	0	0	0	0	0	0	0
05:00	11	11	0	0	0	0	0	0	0	0	0	0	0	0
06:00	31	29	1	0	1	0	0	0	0	0	0	0	0	0
07:00	61	58	1	0	0	0	0	0	0	1	0	1	0	0
08:00	98	92	1	1	0	0	0	0	0	0	0	0	4	0
09:00	50	46	2	0	0	0	0	0	1	0	0	1	0	0
10:00	35	31	2	1	0	0	0	0	0	0	1	0	0	0
11:00	59	50	4	1	1	1	0	0	0	0	0	0	1	1
12:00	53	46	2	1	2	0	0	0	1	0	0	0	1	0
13:00	48	38	4	1	2	0	0	0	0	1	0	0	2	0
14:00	43	35	4	0	3	0	0	0	0	0	1	0	0	0
15:00	55	53	1	0	1	0	0	0	0	0	0	0	0	0
16:00	50	47	1	0	1	0	0	0	0	0	0	0	1	0
17:00	51	50	0	0	1	0	0	0	0	0	0	0	0	0
18:00	31	31	0	0	0	0	0	0	0	0	0	0	0	0
19:00	12	12	0	0	0	0	0	0	0	0	0	0	0	0
20:00	8	8	0	0	0	0	0	0	0	0	0	0	0	0
21:00	9	9	0	0	0	0	0	0	0	0	0	0	0	0
22:00	13	13	0	0	0	0	0	0	0	0	0	0	0	0
23:00	1	1	0	0	0	0	0	0	0	0	0	0	0	0
Total														
12H(7-19)	634	577	22	5	11	1	0	0	2	2	2	2	9	1
16H(6-22)	694	635	23	5	12	1	0	0	2	2	2	2	9	1
18H(6-24)	708	649	23	5	12	1	0	0	2	2	2	2	9	1
24H(0-24)	736	677	23	5	12	1	0	0	2	2	2	2	9	1
AM Peak	08:00	08:00	11:00	11:00	11:00	11:00	11:00	11:00	09:00	07:00	10:00	09:00	08:00	11:00
	98	92	4	1	1	1	0	0	1	1	1	1	4	1
PM Peak	15:00	15:00	14:00	13:00	14:00	23:00	23:00	23:00	12:00	13:00	14:00	23:00	13:00	23:00
	55	53	4	1	3	0	0	0	1	1	1	0	2	0

VDA-pro R2 30/01/2018

Site No. 10218001 Site Ref. 10218001
B5301 Parsonby Brow Parsonby Wigton
Classification Report (Euro 13) 23 January 2018 Channel: Southbound

	Total Volume	Bin 1 Cr/LVn+T	Bin 2 2AxRg	Bin 3 3AxRg	Bin 4 4AxRg	Bin 5 2AxRg+Tr	Bin 6 3AxRg+Tr	Bin 7 Artic2Ax	Bin 8 Artic2Ax	Bin 9 Artic2Ax	Bin 10 Artic3Ax	Bin 11 Artic3Ax	Bin 12 2/3AxBus	Bin 13 >=7Ax/Un
00:00	8	8	0	0	0	0	0	0	0	0	0	0	0	0
01:00	1	1	0	0	0	0	0	0	0	0	0	0	0	0
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00	1	1	0	0	0	0	0	0	0	0	0	0	0	0
04:00	2	2	0	0	0	0	0	0	0	0	0	0	0	0
05:00	13	13	0	0	0	0	0	0	0	0	0	0	0	0
06:00	31	30	1	0	0	0	0	0	0	0	0	0	0	0
07:00	63	58	0	0	1	0	0	0	1	0	0	0	3	0
08:00	100	92	3	0	2	1	0	0	0	0	0	0	2	0
09:00	37	32	3	0	0	0	0	1	1	0	0	0	0	0
10:00	48	41	3	0	1	1	0	0	1	0	0	0	1	0
11:00	45	37	4	1	0	0	0	0	1	1	0	0	1	0
12:00	43	39	0	0	1	0	0	1	0	0	0	0	2	0
13:00	39	34	3	0	0	0	0	0	0	0	1	0	0	1
14:00	46	42	2	0	0	0	0	0	1	0	0	0	1	0
15:00	55	49	0	0	3	0	0	0	0	0	1	0	2	0
16:00	48	48	0	0	0	0	0	0	0	0	0	0	0	0
17:00	45	45	0	0	0	0	0	0	0	0	0	0	0	0
18:00	24	24	0	0	0	0	0	0	0	0	0	0	0	0
19:00	24	24	0	0	0	0	0	0	0	0	0	0	0	0
20:00	12	12	0	0	0	0	0	0	0	0	0	0	0	0
21:00	10	10	0	0	0	0	0	0	0	0	0	0	0	0
22:00	5	5	0	0	0	0	0	0	0	0	0	0	0	0
23:00	1	1	0	0	0	0	0	0	0	0	0	0	0	0
Total														
12H(7-19)	593	541	18	1	8	2	0	2	5	1	2	0	12	1
16H(6-22)	670	617	19	1	8	2	0	2	5	1	2	0	12	1
18H(6-24)	676	623	19	1	8	2	0	2	5	1	2	0	12	1
24H(0-24)	701	648	19	1	8	2	0	2	5	1	2	0	12	1
AM Peak	08:00	08:00	11:00	11:00	08:00	10:00	11:00	09:00	11:00	11:00	11:00	11:00	07:00	11:00
	100	92	4	1	2	1	0	1	1	1	0	0	3	0
PM Peak	15:00	15:00	13:00	23:00	15:00	23:00	23:00	12:00	14:00	23:00	15:00	23:00	15:00	13:00
	55	49	3	0	3	0	0	1	1	0	1	0	2	1

VDA-pro R2 30/01/2018

Site No. 10218001 Site Ref. 10218001
B5301 Parsonby Brow Parsonby Wigton
Classification Report (Euro 13) 22 January 2018 Channel: Total Flow

	Total Volume	Bin 1 Cr/LVn+T	Bin 2 2AxRg	Bin 3 3AxRg	Bin 4 4AxRg	Bin 5 2AxRg+Tr	Bin 6 3AxRg+Tr	Bin 7 Artic2Ax	Bin 8 Artic2Ax	Bin 9 Artic2Ax	Bin 10 Artic3Ax	Bin 11 Artic3Ax	Bin 12 2/3AxBus	Bin 13 >=7Ax/Un
00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:00	3	3	0	0	0	0	0	0	0	0	0	0	0	0
02:00	1	1	0	0	0	0	0	0	0	0	0	0	0	0
03:00	5	5	0	0	0	0	0	0	0	0	0	0	0	0
04:00	13	13	0	0	0	0	0	0	0	0	0	0	0	0
05:00	22	22	0	0	0	0	0	0	0	0	0	0	0	0
06:00	47	45	1	0	1	0	0	0	0	0	0	0	0	0
07:00	92	85	3	0	0	0	0	0	0	2	0	2	0	0
08:00	143	132	4	1	0	0	0	0	0	0	0	0	6	0
09:00	80	69	4	0	1	0	0	0	1	2	0	3	0	0
10:00	71	65	2	2	1	0	0	0	0	0	1	0	0	0
11:00	104	86	8	1	4	1	0	0	0	0	0	1	2	1
12:00	97	86	3	1	3	0	0	0	1	1	0	1	1	0
13:00	95	79	4	1	6	0	0	0	0	1	0	0	4	0
14:00	88	78	4	0	5	0	0	0	0	0	1	0	0	0
15:00	119	114	1	0	2	0	0	0	1	1	0	0	0	0
16:00	134	127	2	1	1	0	0	0	0	1	1	0	1	0
17:00	129	127	1	0	1	0	0	0	0	0	0	0	0	0
18:00	85	85	0	0	0	0	0	0	0	0	0	0	0	0
19:00	31	30	0	0	1	0	0	0	0	0	0	0	0	0
20:00	32	30	0	0	2	0	0	0	0	0	0	0	0	0
21:00	18	16	0	0	2	0	0	0	0	0	0	0	0	0
22:00	23	22	0	0	1	0	0	0	0	0	0	0	0	0
23:00	3	2	0	0	1	0	0	0	0	0	0	0	0	0
Total														
12H(7-19)	1237	1133	36	7	24	1	0	0	3	8	3	7	14	1
16H(6-22)	1365	1254	37	7	30	1	0	0	3	8	3	7	14	1
18H(6-24)	1391	1278	37	7	32	1	0	0	3	8	3	7	14	1
24H(0-24)	1435	1322	37	7	32	1	0	0	3	8	3	7	14	1
AM Peak	08:00	08:00	11:00	10:00	11:00	11:00	11:00	11:00	09:00	09:00	10:00	09:00	08:00	11:00
	143	132	8	2	4	1	0	0	1	2	1	3	6	1
PM Peak	16:00	17:00	14:00	16:00	13:00	23:00	23:00	23:00	15:00	16:00	16:00	12:00	13:00	23:00
	134	127	4	1	6	0	0	0	1	1	1	1	4	0

VDA-pro R2 30/01/2018

Site No. 10218001 Site Ref. 10218001
B5301 Parsonby Brow Parsonby Wigton
Classification Report (Euro 13) 23 January 2018 Channel: Total Flow

	Total Volume	Bin 1 Cr/LVn+T	Bin 2 2AxRg	Bin 3 3AxRg	Bin 4 4AxRg	Bin 5 2AxRg+Tr	Bin 6 3AxRg+Tr	Bin 7 Artic2Ax	Bin 8 Artic2Ax	Bin 9 Artic2Ax	Bin 10 Artic3Ax	Bin 11 Artic3Ax	Bin 12 2/3AxBus	Bin 13 >=7Ax/Un
00:00	11	9	1	0	1	0	0	0	0	0	0	0	0	0
01:00	3	2	0	0	1	0	0	0	0	0	0	0	0	0
02:00	2	2	0	0	0	0	0	0	0	0	0	0	0	0
03:00	1	1	0	0	0	0	0	0	0	0	0	0	0	0
04:00	2	2	0	0	0	0	0	0	0	0	0	0	0	0
05:00	25	25	0	0	0	0	0	0	0	0	0	0	0	0
06:00	45	44	1	0	0	0	0	0	0	0	0	0	0	0
07:00	93	85	0	0	2	0	0	0	1	1	0	0	4	0
08:00	151	135	5	0	3	1	0	0	0	0	0	0	7	0
09:00	84	77	4	0	1	0	0	1	1	0	0	0	0	0
10:00	81	71	5	0	1	1	0	0	1	0	0	1	1	0
11:00	78	63	8	1	0	0	0	0	2	2	0	1	1	0
12:00	82	73	0	0	3	0	0	1	0	1	0	0	4	0
13:00	89	80	6	0	1	0	0	0	0	0	1	0	0	1
14:00	96	87	2	0	1	0	0	0	2	2	0	1	1	0
15:00	127	113	0	0	8	0	0	0	0	0	1	2	3	0
16:00	125	125	0	0	0	0	0	0	0	0	0	0	0	0
17:00	129	124	3	0	1	0	0	0	0	1	0	0	0	0
18:00	83	81	1	0	0	0	0	0	0	0	0	1	0	0
19:00	46	46	0	0	0	0	0	0	0	0	0	0	0	0
20:00	33	30	0	0	3	0	0	0	0	0	0	0	0	0
21:00	25	24	0	0	1	0	0	0	0	0	0	0	0	0
22:00	15	15	0	0	0	0	0	0	0	0	0	0	0	0
23:00	2	2	0	0	0	0	0	0	0	0	0	0	0	0
Total														
12H(7-19)	1218	1114	34	1	21	2	0	2	7	7	2	6	21	1
16H(6-22)	1367	1258	35	1	25	2	0	2	7	7	2	6	21	1
18H(6-24)	1384	1275	35	1	25	2	0	2	7	7	2	6	21	1
24H(0-24)	1428	1316	36	1	27	2	0	2	7	7	2	6	21	1
AM Peak	08:00	08:00	11:00	11:00	08:00	10:00	11:00	09:00	11:00	11:00	11:00	11:00	08:00	11:00
	151	135	8	1	3	1	0	1	2	2	0	1	7	0
PM Peak	17:00	16:00	13:00	23:00	15:00	23:00	23:00	12:00	14:00	14:00	15:00	15:00	12:00	13:00
	129	125	6	0	8	0	0	1	2	2	1	2	4	1

VDA-pro R2 30/01/2018

Site No. 10218001 Site Ref. 10218001
B5301 Parsonby Brow Parsonby Wigton
Classification Report (Euro 13) 24 January 2018 Channel: Northbound

	Total Volume	Bin 1 Cr/LVn+T	Bin 2 2AxRg	Bin 3 3AxRg	Bin 4 4AxRg	Bin 5 2AxRg+Tr	Bin 6 3AxRg+Tr	Bin 7 Artic2Ax	Bin 8 Artic2Ax	Bin 9 Artic2Ax	Bin 10 Artic3Ax	Bin 11 Artic3Ax	Bin 12 2/3AxBus	Bin 13 >=7Ax/Un
00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:00	1	1	0	0	0	0	0	0	0	0	0	0	0	0
03:00	1	1	0	0	0	0	0	0	0	0	0	0	0	0
04:00	1	0	0	0	0	0	0	1	0	0	0	0	0	0
05:00	10	10	0	0	0	0	0	0	0	0	0	0	0	0
06:00	13	13	0	0	0	0	0	0	0	0	0	0	0	0
07:00	30	26	0	0	4	0	0	0	0	0	0	0	0	0
08:00	48	43	0	0	4	0	0	0	0	0	0	1	0	0
09:00	42	37	2	0	2	0	0	0	0	0	0	0	1	0
10:00	43	35	1	0	5	0	0	0	0	1	0	1	0	0
11:00	34	24	2	0	6	0	0	0	0	1	0	0	1	0
12:00	45	38	0	1	1	0	0	0	0	1	0	1	3	0
13:00	54	43	3	0	4	0	0	0	0	1	0	2	1	0
14:00	51	47	1	0	2	0	0	0	0	0	0	1	0	0
15:00	76	73	0	0	2	0	0	0	0	0	0	1	0	0
16:00	71	66	2	0	2	0	0	0	0	1	0	0	0	0
17:00	101	97	1	0	1	0	0	0	0	0	0	0	2	0
18:00	41	39	0	0	2	0	0	0	0	0	0	0	0	0
19:00	32	30	1	0	0	0	0	0	0	1	0	0	0	0
20:00	33	31	0	0	2	0	0	0	0	0	0	0	0	0
21:00	18	17	0	0	0	0	0	0	0	0	0	0	1	0
22:00	6	5	0	0	1	0	0	0	0	0	0	0	0	0
23:00	4	4	0	0	0	0	0	0	0	0	0	0	0	0
Total														
12H(7-19)	636	568	12	1	35	0	0	0	0	5	0	7	8	0
16H(6-22)	732	659	13	1	37	0	0	0	0	6	0	7	9	0
18H(6-24)	742	668	13	1	38	0	0	0	0	6	0	7	9	0
24H(0-24)	755	680	13	1	38	0	0	1	0	6	0	7	9	0
AM Peak	08:00	08:00	11:00	11:00	11:00	11:00	11:00	04:00	11:00	11:00	11:00	10:00	11:00	11:00
	48	43	2	0	6	0	0	1	0	1	0	1	1	0
PM Peak	17:00	17:00	13:00	12:00	13:00	23:00	23:00	23:00	23:00	19:00	23:00	13:00	12:00	23:00
	101	97	3	1	4	0	0	0	0	1	0	2	3	0

VDA-pro R2 30/01/2018

Site No. 10218001 Site Ref. 10218001
B5301 Parsonby Brow Parsonby Wigton
Classification Report (Euro 13) 25 January 2018 Channel: Northbound

	Total Volume	Bin 1 Cr/LVn+T	Bin 2 2AxRg	Bin 3 3AxRg	Bin 4 4AxRg	Bin 5 2AxRg+Tr	Bin 6 3AxRg+Tr	Bin 7 Artic2Ax	Bin 8 Artic2Ax	Bin 9 Artic2Ax	Bin 10 Artic3Ax	Bin 11 Artic3Ax	Bin 12 2/3AxBus	Bin 13 >=7Ax/Un
00:00	4	3	0	0	1	0	0	0	0	0	0	0	0	0
01:00	2	1	0	0	1	0	0	0	0	0	0	0	0	0
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00	9	9	0	0	0	0	0	0	0	0	0	0	0	0
06:00	15	14	1	0	0	0	0	0	0	0	0	0	0	0
07:00	34	33	0	0	0	0	0	1	0	0	0	0	0	0
08:00	52	43	2	0	4	0	0	0	0	1	0	1	1	0
09:00	49	37	3	0	5	0	0	0	0	0	0	1	3	0
10:00	43	36	0	0	5	0	0	0	0	2	0	0	0	0
11:00	55	45	3	0	3	0	0	0	0	1	1	0	2	0
12:00	38	33	1	0	3	0	0	0	0	0	0	1	0	0
13:00	61	53	2	0	4	0	0	0	0	1	1	0	0	0
14:00	55	49	0	1	2	0	0	0	0	2	0	0	1	0
15:00	79	67	2	1	4	1	0	0	0	1	0	1	2	0
16:00	81	75	3	0	2	0	0	0	0	0	0	1	0	0
17:00	83	80	1	0	0	1	0	0	0	1	0	0	0	0
18:00	42	42	0	0	0	0	0	0	0	0	0	0	0	0
19:00	28	27	1	0	0	0	0	0	0	0	0	0	0	0
20:00	14	13	0	0	1	0	0	0	0	0	0	0	0	0
21:00	16	12	1	0	3	0	0	0	0	0	0	0	0	0
22:00	12	12	0	0	0	0	0	0	0	0	0	0	0	0
23:00	6	6	0	0	0	0	0	0	0	0	0	0	0	0
Total														
12H(7-19)	672	593	17	2	32	2	0	1	0	9	2	5	9	0
16H(6-22)	745	659	20	2	36	2	0	1	0	9	2	5	9	0
18H(6-24)	763	677	20	2	36	2	0	1	0	9	2	5	9	0
24H(0-24)	778	690	20	2	38	2	0	1	0	9	2	5	9	0
AM Peak	11:00	11:00	11:00	11:00	10:00	11:00	11:00	07:00	11:00	10:00	11:00	09:00	09:00	11:00
	55	45	3	0	5	0	0	1	0	2	1	1	3	0
PM Peak	17:00	17:00	16:00	15:00	15:00	17:00	23:00	23:00	23:00	14:00	13:00	16:00	15:00	23:00
	83	80	3	1	4	1	0	0	0	2	1	1	2	0

VDA-pro R2 30/01/2018

Site No. 10218001 Site Ref. 10218001
B5301 Parsonby Brow Parsonby Wigton
Classification Report (Euro 13) 24 January 2018 Channel: Southbound

	Total Volume	Bin 1 Cr/LVn+T	Bin 2 2AxRg	Bin 3 3AxRg	Bin 4 4AxRg	Bin 5 2AxRg+Tr	Bin 6 3AxRg+Tr	Bin 7 Artic2Ax	Bin 8 Artic2Ax	Bin 9 Artic2Ax	Bin 10 Artic3Ax	Bin 11 Artic3Ax	Bin 12 2/3AxBus	Bin 13 >=7Ax/Un
00:00	7	7	0	0	0	0	0	0	0	0	0	0	0	0
01:00	1	1	0	0	0	0	0	0	0	0	0	0	0	0
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00	2	2	0	0	0	0	0	0	0	0	0	0	0	0
04:00	3	3	0	0	0	0	0	0	0	0	0	0	0	0
05:00	15	15	0	0	0	0	0	0	0	0	0	0	0	0
06:00	39	35	1	0	2	0	0	1	0	0	0	0	0	0
07:00	70	69	0	0	1	0	0	0	0	0	0	0	0	0
08:00	85	77	3	1	1	0	0	0	0	1	2	0	0	0
09:00	59	50	3	0	4	0	0	1	0	1	0	0	0	0
10:00	42	29	3	1	5	0	0	0	0	1	1	0	2	0
11:00	50	46	1	1	1	0	0	0	0	0	1	0	0	0
12:00	51	43	1	1	3	0	0	0	1	0	0	0	1	1
13:00	52	44	1	0	2	0	0	1	0	0	0	0	4	0
14:00	47	43	1	0	3	0	0	0	0	0	0	0	0	0
15:00	54	47	1	0	3	0	0	0	0	0	1	0	2	0
16:00	56	52	2	0	1	0	0	0	0	0	1	0	0	0
17:00	43	43	0	0	0	0	0	0	0	0	0	0	0	0
18:00	29	29	0	0	0	0	0	0	0	0	0	0	0	0
19:00	16	14	0	1	0	0	0	0	0	1	0	0	0	0
20:00	12	12	0	0	0	0	0	0	0	0	0	0	0	0
21:00	10	9	0	0	0	0	0	0	0	1	0	0	0	0
22:00	11	11	0	0	0	0	0	0	0	0	0	0	0	0
23:00	7	7	0	0	0	0	0	0	0	0	0	0	0	0
Total														
12H(7-19)	638	572	16	4	24	0	0	2	1	3	6	0	9	1
16H(6-22)	715	642	17	5	26	0	0	3	1	5	6	0	9	1
18H(6-24)	733	660	17	5	26	0	0	3	1	5	6	0	9	1
24H(0-24)	761	688	17	5	26	0	0	3	1	5	6	0	9	1
AM Peak	08:00	08:00	10:00	11:00	10:00	11:00	11:00	09:00	11:00	10:00	08:00	11:00	10:00	11:00
	85	77	3	1	5	0	0	1	0	1	2	0	2	0
PM Peak	16:00	16:00	16:00	19:00	15:00	23:00	23:00	13:00	12:00	21:00	16:00	23:00	13:00	12:00
	56	52	2	1	3	0	0	1	1	1	1	0	4	1

VDA-pro R2 30/01/2018

Site No. 10218001 Site Ref. 10218001
B5301 Parsonby Brow Parsonby Wigton
Classification Report (Euro 13) 25 January 2018 Channel: Southbound

	Total Volume	Bin 1 Cr/LVn+T	Bin 2 2AxRg	Bin 3 3AxRg	Bin 4 4AxRg	Bin 5 2AxRg+Tr	Bin 6 3AxRg+Tr	Bin 7 Artic2Ax	Bin 8 Artic2Ax	Bin 9 Artic2Ax	Bin 10 Artic3Ax	Bin 11 Artic3Ax	Bin 12 2/3AxBus	Bin 13 >=7Ax/Un
00:00	7	6	1	0	0	0	0	0	0	0	0	0	0	0
01:00	3	2	1	0	0	0	0	0	0	0	0	0	0	0
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:00	9	9	0	0	0	0	0	0	0	0	0	0	0	0
05:00	18	17	0	0	0	0	0	0	0	1	0	0	0	0
06:00	33	33	0	0	0	0	0	0	0	0	0	0	0	0
07:00	70	63	1	0	4	0	0	0	0	0	0	0	1	1
08:00	94	85	6	0	0	0	0	1	0	0	0	0	2	0
09:00	60	51	4	0	4	0	0	0	0	0	1	0	0	0
10:00	54	48	1	0	3	0	0	0	0	0	0	0	2	0
11:00	51	48	0	0	2	0	0	0	0	1	0	0	0	0
12:00	52	42	4	0	2	0	0	1	1	0	0	0	2	0
13:00	60	54	0	3	1	0	0	0	1	0	1	0	0	0
14:00	39	34	1	0	3	0	0	0	1	0	0	0	0	0
15:00	46	42	3	0	1	0	0	0	0	0	0	0	0	0
16:00	52	51	0	1	0	0	0	0	0	0	0	0	0	0
17:00	47	43	1	0	0	0	0	0	1	0	0	0	2	0
18:00	32	32	0	0	0	0	0	0	0	0	0	0	0	0
19:00	18	14	1	0	0	0	0	0	0	0	0	0	3	0
20:00	10	10	0	0	0	0	0	0	0	0	0	0	0	0
21:00	6	4	2	0	0	0	0	0	0	0	0	0	0	0
22:00	12	12	0	0	0	0	0	0	0	0	0	0	0	0
23:00	3	3	0	0	0	0	0	0	0	0	0	0	0	0
Total														
12H(7-19)	657	593	21	4	20	0	0	2	4	1	2	0	9	1
16H(6-22)	724	654	24	4	20	0	0	2	4	1	2	0	12	1
18H(6-24)	739	669	24	4	20	0	0	2	4	1	2	0	12	1
24H(0-24)	776	703	26	4	20	0	0	2	4	2	2	0	12	1
AM Peak	08:00	08:00	08:00	11:00	09:00	11:00	11:00	08:00	11:00	11:00	09:00	11:00	10:00	07:00
	94	85	6	0	4	0	0	1	0	1	1	0	2	1
PM Peak	13:00	13:00	12:00	13:00	14:00	23:00	23:00	12:00	17:00	23:00	13:00	23:00	19:00	23:00
	60	54	4	3	3	0	0	1	1	0	1	0	3	0

VDA-pro R2 30/01/2018

Site No. 10218001 Site Ref. 10218001
B5301 Parsonby Brow Parsonby Wigton
Classification Report (Euro 13) 24 January 2018 Channel: Total Flow

	Total Volume	Bin 1 Cr/LVn+T	Bin 2 2AxRg	Bin 3 3AxRg	Bin 4 4AxRg	Bin 5 2AxRg+Tr	Bin 6 3AxRg+Tr	Bin 7 Artic2Ax	Bin 8 Artic2Ax	Bin 9 Artic2Ax	Bin 10 Artic3Ax	Bin 11 Artic3Ax	Bin 12 2/3AxBus	Bin 13 >=7Ax/Un
00:00	7	7	0	0	0	0	0	0	0	0	0	0	0	0
01:00	1	1	0	0	0	0	0	0	0	0	0	0	0	0
02:00	1	1	0	0	0	0	0	0	0	0	0	0	0	0
03:00	3	3	0	0	0	0	0	0	0	0	0	0	0	0
04:00	4	3	0	0	0	0	0	1	0	0	0	0	0	0
05:00	25	25	0	0	0	0	0	0	0	0	0	0	0	0
06:00	52	48	1	0	2	0	0	1	0	0	0	0	0	0
07:00	100	95	0	0	5	0	0	0	0	0	0	0	0	0
08:00	133	120	3	1	5	0	0	0	0	1	2	1	0	0
09:00	101	87	5	0	6	0	0	1	0	1	0	0	1	0
10:00	85	64	4	1	10	0	0	0	0	2	1	1	2	0
11:00	84	70	3	1	7	0	0	0	0	1	1	0	1	0
12:00	96	81	1	2	4	0	0	0	1	1	0	1	4	1
13:00	106	87	4	0	6	0	0	1	0	1	0	2	5	0
14:00	98	90	2	0	5	0	0	0	0	0	0	1	0	0
15:00	130	120	1	0	5	0	0	0	0	0	1	1	2	0
16:00	127	118	4	0	3	0	0	0	0	1	1	0	0	0
17:00	144	140	1	0	1	0	0	0	0	0	0	0	2	0
18:00	70	68	0	0	2	0	0	0	0	0	0	0	0	0
19:00	48	44	1	1	0	0	0	0	0	2	0	0	0	0
20:00	45	43	0	0	2	0	0	0	0	0	0	0	0	0
21:00	28	26	0	0	0	0	0	0	0	1	0	0	1	0
22:00	17	16	0	0	1	0	0	0	0	0	0	0	0	0
23:00	11	11	0	0	0	0	0	0	0	0	0	0	0	0
Total														
12H(7-19)	1274	1140	28	5	59	0	0	2	1	8	6	7	17	1
16H(6-22)	1447	1301	30	6	63	0	0	3	1	11	6	7	18	1
18H(6-24)	1475	1328	30	6	64	0	0	3	1	11	6	7	18	1
24H(0-24)	1516	1368	30	6	64	0	0	4	1	11	6	7	18	1
AM Peak	08:00	08:00	09:00	11:00	10:00	11:00	11:00	09:00	11:00	10:00	08:00	10:00	10:00	11:00
	133	120	5	1	10	0	0	1	0	2	2	1	2	0
PM Peak	17:00	17:00	16:00	12:00	13:00	23:00	23:00	13:00	12:00	19:00	16:00	13:00	13:00	12:00
	144	140	4	2	6	0	0	1	1	2	1	2	5	1

VDA-pro R2 30/01/2018

Site No. 10218001 Site Ref. 10218001
B5301 Parsonby Brow Parsonby Wigton
Classification Report (Euro 13) 25 January 2018 Channel: Total Flow

	Total Volume	Bin 1 Cr/LVn+T	Bin 2 2AxRg	Bin 3 3AxRg	Bin 4 4AxRg	Bin 5 2AxRg+Tr	Bin 6 3AxRg+Tr	Bin 7 Artic2Ax	Bin 8 Artic2Ax	Bin 9 Artic2Ax	Bin 10 Artic3Ax	Bin 11 Artic3Ax	Bin 12 2/3AxBus	Bin 13 >=7Ax/Un
00:00	11	9	1	0	1	0	0	0	0	0	0	0	0	0
01:00	5	3	1	0	1	0	0	0	0	0	0	0	0	0
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:00	9	9	0	0	0	0	0	0	0	0	0	0	0	0
05:00	27	26	0	0	0	0	0	0	0	1	0	0	0	0
06:00	48	47	1	0	0	0	0	0	0	0	0	0	0	0
07:00	104	96	1	0	4	0	0	1	0	0	0	0	1	1
08:00	146	128	8	0	4	0	0	1	0	1	0	1	3	0
09:00	109	88	7	0	9	0	0	0	0	0	1	1	3	0
10:00	97	84	1	0	8	0	0	0	0	2	0	0	2	0
11:00	106	93	3	0	5	0	0	0	0	2	1	0	2	0
12:00	90	75	5	0	5	0	0	1	1	0	0	1	2	0
13:00	121	107	2	3	5	0	0	0	1	1	2	0	0	0
14:00	94	83	1	1	5	0	0	0	1	2	0	0	1	0
15:00	125	109	5	1	5	1	0	0	0	1	0	1	2	0
16:00	133	126	3	1	2	0	0	0	0	0	0	1	0	0
17:00	130	123	2	0	0	1	0	0	1	1	0	0	2	0
18:00	74	74	0	0	0	0	0	0	0	0	0	0	0	0
19:00	46	41	2	0	0	0	0	0	0	0	0	0	3	0
20:00	24	23	0	0	1	0	0	0	0	0	0	0	0	0
21:00	22	16	3	0	3	0	0	0	0	0	0	0	0	0
22:00	24	24	0	0	0	0	0	0	0	0	0	0	0	0
23:00	9	9	0	0	0	0	0	0	0	0	0	0	0	0
Total														
12H(7-19)	1329	1186	38	6	52	2	0	3	4	10	4	5	18	1
16H(6-22)	1469	1313	44	6	56	2	0	3	4	10	4	5	21	1
18H(6-24)	1502	1346	44	6	56	2	0	3	4	10	4	5	21	1
24H(0-24)	1554	1393	46	6	58	2	0	3	4	11	4	5	21	1
AM Peak	08:00	08:00	08:00	11:00	09:00	11:00	11:00	08:00	11:00	11:00	11:00	09:00	09:00	07:00
	146	128	8	0	9	0	0	1	0	2	1	1	3	1
PM Peak	16:00	16:00	15:00	13:00	15:00	17:00	23:00	12:00	17:00	14:00	13:00	16:00	19:00	23:00
	133	126	5	3	5	1	0	1	1	2	2	1	3	0

VDA-pro R2 30/01/2018

Site No. 10218001 Site Ref. 10218001
B5301 Parsonby Brow Parsonby Wigton
Classification Report (Euro 13) 26 January 2018 Channel: Northbound

	Total Volume	Bin 1 Cr/LVn+T	Bin 2 2AxRg	Bin 3 3AxRg	Bin 4 4AxRg	Bin 5 2AxRg+Tr	Bin 6 3AxRg+Tr	Bin 7 Artic2Ax	Bin 8 Artic2Ax	Bin 9 Artic2Ax	Bin 10 Artic3Ax	Bin 11 Artic3Ax	Bin 12 2/3AxBus	Bin 13 >=7Ax/Un
00:00	1	1	0	0	0	0	0	0	0	0	0	0	0	0
01:00	3	2	0	0	1	0	0	0	0	0	0	0	0	0
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:00	1	1	0	0	0	0	0	0	0	0	0	0	0	0
05:00	21	21	0	0	0	0	0	0	0	0	0	0	0	0
06:00	10	10	0	0	0	0	0	0	0	0	0	0	0	0
07:00	28	28	0	0	0	0	0	0	0	0	0	0	0	0
08:00	41	39	0	0	1	0	0	0	1	0	0	0	0	0
09:00	31	26	1	1	3	0	0	0	0	0	0	0	0	0
10:00	38	34	2	0	1	0	0	0	0	0	0	1	0	0
11:00	47	44	3	0	0	0	0	0	0	0	0	0	0	0
12:00	52	49	0	0	1	0	0	0	0	0	0	2	0	0
13:00	47	41	0	0	2	0	0	0	0	0	0	2	2	0
14:00	73	65	3	0	2	0	0	0	0	0	0	1	2	0
15:00	71	64	2	1	2	0	0	0	0	0	0	2	0	0
16:00	84	83	0	0	0	0	0	0	0	0	0	1	0	0
17:00	83	78	0	1	2	0	0	0	0	0	0	0	2	0
18:00	54	54	0	0	0	0	0	0	0	0	0	0	0	0
19:00	31	29	1	0	1	0	0	0	0	0	0	0	0	0
20:00	19	16	1	0	2	0	0	0	0	0	0	0	0	0
21:00	24	23	0	0	1	0	0	0	0	0	0	0	0	0
22:00	15	14	0	0	1	0	0	0	0	0	0	0	0	0
23:00	10	10	0	0	0	0	0	0	0	0	0	0	0	0
Total														
12H(7-19)	649	605	11	3	14	0	0	0	1	0	0	9	6	0
16H(6-22)	733	683	13	3	18	0	0	0	1	0	0	9	6	0
18H(6-24)	758	707	13	3	19	0	0	0	1	0	0	9	6	0
24H(0-24)	784	732	13	3	20	0	0	0	1	0	0	9	6	0
AM Peak	11:00	11:00	11:00	09:00	09:00	11:00	11:00	11:00	08:00	11:00	11:00	10:00	11:00	11:00
	47	44	3	1	3	0	0	0	1	0	0	1	0	0
PM Peak	16:00	16:00	14:00	17:00	20:00	23:00	23:00	23:00	23:00	23:00	23:00	15:00	17:00	23:00
	84	83	3	1	2	0	0	0	0	0	0	2	2	0

VDA-pro R2 30/01/2018

Site No. 10218001 Site Ref. 10218001
B5301 Parsonby Brow Parsonby Wigton
Classification Report (Euro 13) 27 January 2018 Channel: Northbound

	Total Volume	Bin 1 Cr/LVn+T	Bin 2 2AxRg	Bin 3 3AxRg	Bin 4 4AxRg	Bin 5 2AxRg+Tr	Bin 6 3AxRg+Tr	Bin 7 Artic2Ax	Bin 8 Artic2Ax	Bin 9 Artic2Ax	Bin 10 Artic3Ax	Bin 11 Artic3Ax	Bin 12 2/3AxBus	Bin 13 >=7Ax/Un
00:00	6	5	0	0	1	0	0	0	0	0	0	0	0	0
01:00	3	2	0	0	1	0	0	0	0	0	0	0	0	0
02:00	8	8	0	0	0	0	0	0	0	0	0	0	0	0
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:00	1	1	0	0	0	0	0	0	0	0	0	0	0	0
05:00	8	8	0	0	0	0	0	0	0	0	0	0	0	0
06:00	4	4	0	0	0	0	0	0	0	0	0	0	0	0
07:00	7	7	0	0	0	0	0	0	0	0	0	0	0	0
08:00	20	18	2	0	0	0	0	0	0	0	0	0	0	0
09:00	15	14	0	0	0	0	0	0	0	0	0	0	1	0
10:00	34	34	0	0	0	0	0	0	0	0	0	0	0	0
11:00	38	37	1	0	0	0	0	0	0	0	0	0	0	0
12:00	52	52	0	0	0	0	0	0	0	0	0	0	0	0
13:00	54	53	0	0	0	0	0	0	0	0	0	0	1	0
14:00	50	50	0	0	0	0	0	0	0	0	0	0	0	0
15:00	54	54	0	0	0	0	0	0	0	0	0	0	0	0
16:00	44	44	0	0	0	0	0	0	0	0	0	0	0	0
17:00	39	38	1	0	0	0	0	0	0	0	0	0	0	0
18:00	30	30	0	0	0	0	0	0	0	0	0	0	0	0
19:00	22	22	0	0	0	0	0	0	0	0	0	0	0	0
20:00	20	18	0	0	2	0	0	0	0	0	0	0	0	0
21:00	18	16	0	0	2	0	0	0	0	0	0	0	0	0
22:00	15	15	0	0	0	0	0	0	0	0	0	0	0	0
23:00	3	3	0	0	0	0	0	0	0	0	0	0	0	0
Total														
12H(7-19)	437	431	4	0	0	0	0	0	0	0	0	0	2	0
16H(6-22)	501	491	4	0	4	0	0	0	0	0	0	0	2	0
18H(6-24)	519	509	4	0	4	0	0	0	0	0	0	0	2	0
24H(0-24)	545	533	4	0	6	0	0	0	0	0	0	0	2	0
AM Peak	11:00	11:00	08:00	11:00	01:00	11:00	11:00	11:00	11:00	11:00	11:00	11:00	09:00	11:00
	38	37	2	0	1	0	0	0	0	0	0	0	1	0
PM Peak	15:00	15:00	17:00	23:00	21:00	23:00	23:00	23:00	23:00	23:00	23:00	23:00	13:00	23:00
	54	54	1	0	2	0	0	0	0	0	0	0	1	0

VDA-pro R2 30/01/2018

Site No. 10218001 Site Ref. 10218001
B5301 Parsonby Brow Parsonby Wigton
Classification Report (Euro 13) 26 January 2018 Channel: Southbound

	Total Volume	Bin 1 Cr/LVn+T	Bin 2 2AxRg	Bin 3 3AxRg	Bin 4 4AxRg	Bin 5 2AxRg+Tr	Bin 6 3AxRg+Tr	Bin 7 Artic2Ax	Bin 8 Artic2Ax	Bin 9 Artic2Ax	Bin 10 Artic3Ax	Bin 11 Artic3Ax	Bin 12 2/3AxBus	Bin 13 >=7Ax/Un
00:00	8	8	0	0	0	0	0	0	0	0	0	0	0	0
01:00	1	1	0	0	0	0	0	0	0	0	0	0	0	0
02:00	1	1	0	0	0	0	0	0	0	0	0	0	0	0
03:00	1	0	0	1	0	0	0	0	0	0	0	0	0	0
04:00	2	2	0	0	0	0	0	0	0	0	0	0	0	0
05:00	11	11	0	0	0	0	0	0	0	0	0	0	0	0
06:00	36	36	0	0	0	0	0	0	0	0	0	0	0	0
07:00	76	71	2	0	1	0	0	0	2	0	0	0	0	0
08:00	81	79	1	1	0	0	0	0	0	0	0	0	0	0
09:00	52	46	1	0	2	1	0	1	0	0	0	0	1	0
10:00	43	41	0	0	0	1	0	0	0	0	1	0	0	0
11:00	54	50	2	0	1	0	0	0	1	0	0	0	0	0
12:00	44	39	1	1	0	0	0	1	0	0	0	0	2	0
13:00	84	75	6	0	1	0	0	0	0	1	0	0	1	0
14:00	57	54	0	0	0	0	0	1	0	0	0	0	2	0
15:00	51	44	1	3	1	0	0	0	0	0	0	0	2	0
16:00	51	46	2	0	1	0	0	1	0	0	0	0	1	0
17:00	49	48	0	0	1	0	0	0	0	0	0	0	0	0
18:00	49	49	0	0	0	0	0	0	0	0	0	0	0	0
19:00	26	26	0	0	0	0	0	0	0	0	0	0	0	0
20:00	9	9	0	0	0	0	0	0	0	0	0	0	0	0
21:00	19	19	0	0	0	0	0	0	0	0	0	0	0	0
22:00	4	4	0	0	0	0	0	0	0	0	0	0	0	0
23:00	6	6	0	0	0	0	0	0	0	0	0	0	0	0
Total														
12H(7-19)	691	642	16	5	8	2	0	4	3	1	1	0	9	0
16H(6-22)	781	732	16	5	8	2	0	4	3	1	1	0	9	0
18H(6-24)	791	742	16	5	8	2	0	4	3	1	1	0	9	0
24H(0-24)	815	765	16	6	8	2	0	4	3	1	1	0	9	0
AM Peak	08:00	08:00	11:00	08:00	09:00	10:00	11:00	09:00	07:00	11:00	10:00	11:00	09:00	11:00
	81	79	2	1	2	1	0	1	2	0	1	0	1	0
PM Peak	13:00	13:00	13:00	15:00	17:00	23:00	23:00	16:00	23:00	13:00	23:00	23:00	15:00	23:00
	84	75	6	3	1	0	0	1	0	1	0	0	2	0

VDA-pro R2 30/01/2018

Site No. 10218001 Site Ref. 10218001
B5301 Parsonby Brow Parsonby Wigton
Classification Report (Euro 13) 27 January 2018 Channel: Southbound

	Total Volume	Bin 1 Cr/LVn+T	Bin 2 2AxRg	Bin 3 3AxRg	Bin 4 4AxRg	Bin 5 2AxRg+Tr	Bin 6 3AxRg+Tr	Bin 7 Artic2Ax	Bin 8 Artic2Ax	Bin 9 Artic2Ax	Bin 10 Artic3Ax	Bin 11 Artic3Ax	Bin 12 2/3AxBus	Bin 13 >=7Ax/Un
00:00	2	2	0	0	0	0	0	0	0	0	0	0	0	0
01:00	2	2	0	0	0	0	0	0	0	0	0	0	0	0
02:00	4	3	1	0	0	0	0	0	0	0	0	0	0	0
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:00	2	2	0	0	0	0	0	0	0	0	0	0	0	0
05:00	7	7	0	0	0	0	0	0	0	0	0	0	0	0
06:00	16	16	0	0	0	0	0	0	0	0	0	0	0	0
07:00	17	17	0	0	0	0	0	0	0	0	0	0	0	0
08:00	34	34	0	0	0	0	0	0	0	0	0	0	0	0
09:00	41	41	0	0	0	0	0	0	0	0	0	0	0	0
10:00	58	58	0	0	0	0	0	0	0	0	0	0	0	0
11:00	42	42	0	0	0	0	0	0	0	0	0	0	0	0
12:00	47	47	0	0	0	0	0	0	0	0	0	0	0	0
13:00	60	60	0	0	0	0	0	0	0	0	0	0	0	0
14:00	36	36	0	0	0	0	0	0	0	0	0	0	0	0
15:00	27	27	0	0	0	0	0	0	0	0	0	0	0	0
16:00	27	27	0	0	0	0	0	0	0	0	0	0	0	0
17:00	27	27	0	0	0	0	0	0	0	0	0	0	0	0
18:00	42	42	0	0	0	0	0	0	0	0	0	0	0	0
19:00	16	15	1	0	0	0	0	0	0	0	0	0	0	0
20:00	10	10	0	0	0	0	0	0	0	0	0	0	0	0
21:00	12	11	1	0	0	0	0	0	0	0	0	0	0	0
22:00	11	11	0	0	0	0	0	0	0	0	0	0	0	0
23:00	16	16	0	0	0	0	0	0	0	0	0	0	0	0
Total														
12H(7-19)	458	458	0	0	0	0	0	0	0	0	0	0	0	0
16H(6-22)	512	510	2	0	0	0	0	0	0	0	0	0	0	0
18H(6-24)	539	537	2	0	0	0	0	0	0	0	0	0	0	0
24H(0-24)	556	553	3	0	0	0	0	0	0	0	0	0	0	0
AM Peak	10:00	10:00	02:00	11:00	11:00	11:00	11:00	11:00	11:00	11:00	11:00	11:00	11:00	11:00
	58	58	1	0	0	0	0	0	0	0	0	0	0	0
PM Peak	13:00	13:00	21:00	23:00	23:00	23:00	23:00	23:00	23:00	23:00	23:00	23:00	23:00	23:00
	60	60	1	0	0	0	0	0	0	0	0	0	0	0

VDA-pro R2 30/01/2018

Site No. 10218001 Site Ref. 10218001
B5301 Parsonby Brow Parsonby Wigton
Classification Report (Euro 13) 26 January 2018 Channel: Total Flow

	Total Volume	Bin 1 Cr/LVn+T	Bin 2 2AxRg	Bin 3 3AxRg	Bin 4 4AxRg	Bin 5 2AxRg+Tr	Bin 6 3AxRg+Tr	Bin 7 Artic2Ax	Bin 8 Artic2Ax	Bin 9 Artic2Ax	Bin 10 Artic3Ax	Bin 11 Artic3Ax	Bin 12 2/3AxBus	Bin 13 >=7Ax/Un
00:00	9	9	0	0	0	0	0	0	0	0	0	0	0	0
01:00	4	3	0	0	1	0	0	0	0	0	0	0	0	0
02:00	1	1	0	0	0	0	0	0	0	0	0	0	0	0
03:00	1	0	0	1	0	0	0	0	0	0	0	0	0	0
04:00	3	3	0	0	0	0	0	0	0	0	0	0	0	0
05:00	32	32	0	0	0	0	0	0	0	0	0	0	0	0
06:00	46	46	0	0	0	0	0	0	0	0	0	0	0	0
07:00	104	99	2	0	1	0	0	0	2	0	0	0	0	0
08:00	122	118	1	1	1	0	0	0	1	0	0	0	0	0
09:00	83	72	2	1	5	1	0	1	0	0	0	0	1	0
10:00	81	75	2	0	1	1	0	0	0	0	1	1	0	0
11:00	101	94	5	0	1	0	0	0	1	0	0	0	0	0
12:00	96	88	1	1	1	0	0	1	0	0	0	2	2	0
13:00	131	116	6	0	3	0	0	0	0	1	0	2	3	0
14:00	130	119	3	0	2	0	0	1	0	0	0	1	4	0
15:00	122	108	3	4	3	0	0	0	0	0	0	2	2	0
16:00	135	129	2	0	1	0	0	1	0	0	0	1	1	0
17:00	132	126	0	1	3	0	0	0	0	0	0	0	2	0
18:00	103	103	0	0	0	0	0	0	0	0	0	0	0	0
19:00	57	55	1	0	1	0	0	0	0	0	0	0	0	0
20:00	28	25	1	0	2	0	0	0	0	0	0	0	0	0
21:00	43	42	0	0	1	0	0	0	0	0	0	0	0	0
22:00	19	18	0	0	1	0	0	0	0	0	0	0	0	0
23:00	16	16	0	0	0	0	0	0	0	0	0	0	0	0
Total														
12H(7-19)	1340	1247	27	8	22	2	0	4	4	1	1	9	15	0
16H(6-22)	1514	1415	29	8	26	2	0	4	4	1	1	9	15	0
18H(6-24)	1549	1449	29	8	27	2	0	4	4	1	1	9	15	0
24H(0-24)	1599	1497	29	9	28	2	0	4	4	1	1	9	15	0
AM Peak	08:00	08:00	11:00	09:00	09:00	10:00	11:00	09:00	07:00	11:00	10:00	10:00	09:00	11:00
	122	118	5	1	5	1	0	1	2	0	1	1	1	0
PM Peak	16:00	16:00	13:00	15:00	17:00	23:00	23:00	16:00	23:00	13:00	23:00	15:00	14:00	23:00
	135	129	6	4	3	0	0	1	0	1	0	2	4	0

VDA-pro R2 30/01/2018

Site No. 10218001 Site Ref. 10218001
B5301 Parsonby Brow Parsonby Wigton
Classification Report (Euro 13) 27 January 2018 Channel: Total Flow

	Total Volume	Bin 1 Cr/LVn+T	Bin 2 2AxRg	Bin 3 3AxRg	Bin 4 4AxRg	Bin 5 2AxRg+Tr	Bin 6 3AxRg+Tr	Bin 7 Artic2Ax	Bin 8 Artic2Ax	Bin 9 Artic2Ax	Bin 10 Artic3Ax	Bin 11 Artic3Ax	Bin 12 2/3AxBus	Bin 13 >=7Ax/Un
00:00	8	7	0	0	1	0	0	0	0	0	0	0	0	0
01:00	5	4	0	0	1	0	0	0	0	0	0	0	0	0
02:00	12	11	1	0	0	0	0	0	0	0	0	0	0	0
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:00	3	3	0	0	0	0	0	0	0	0	0	0	0	0
05:00	15	15	0	0	0	0	0	0	0	0	0	0	0	0
06:00	20	20	0	0	0	0	0	0	0	0	0	0	0	0
07:00	24	24	0	0	0	0	0	0	0	0	0	0	0	0
08:00	54	52	2	0	0	0	0	0	0	0	0	0	0	0
09:00	56	55	0	0	0	0	0	0	0	0	0	0	1	0
10:00	92	92	0	0	0	0	0	0	0	0	0	0	0	0
11:00	80	79	1	0	0	0	0	0	0	0	0	0	0	0
12:00	99	99	0	0	0	0	0	0	0	0	0	0	0	0
13:00	114	113	0	0	0	0	0	0	0	0	0	0	1	0
14:00	86	86	0	0	0	0	0	0	0	0	0	0	0	0
15:00	81	81	0	0	0	0	0	0	0	0	0	0	0	0
16:00	71	71	0	0	0	0	0	0	0	0	0	0	0	0
17:00	66	65	1	0	0	0	0	0	0	0	0	0	0	0
18:00	72	72	0	0	0	0	0	0	0	0	0	0	0	0
19:00	38	37	1	0	0	0	0	0	0	0	0	0	0	0
20:00	30	28	0	0	2	0	0	0	0	0	0	0	0	0
21:00	30	27	1	0	2	0	0	0	0	0	0	0	0	0
22:00	26	26	0	0	0	0	0	0	0	0	0	0	0	0
23:00	19	19	0	0	0	0	0	0	0	0	0	0	0	0
Total														
12H(7-19)	895	889	4	0	0	0	0	0	0	0	0	0	2	0
16H(6-22)	1013	1001	6	0	4	0	0	0	0	0	0	0	2	0
18H(6-24)	1058	1046	6	0	4	0	0	0	0	0	0	0	2	0
24H(0-24)	1101	1086	7	0	6	0	0	0	0	0	0	0	2	0
AM Peak	10:00	10:00	08:00	11:00	01:00	11:00	11:00	11:00	11:00	11:00	11:00	11:00	09:00	11:00
	92	92	2	0	1	0	0	0	0	0	0	0	1	0
PM Peak	13:00	13:00	21:00	23:00	21:00	23:00	23:00	23:00	23:00	23:00	23:00	23:00	13:00	23:00
	114	113	1	0	2	0	0	0	0	0	0	0	1	0

VDA-pro R2 30/01/2018

Site No. 10218001 Site Ref. 10218001
B5301 Parsonby Brow Parsonby Wigton
Classification Report (Euro 13) 28 January 2018 Channel: Northbound

	Total Volume	Bin 1 Cr/LVn+T	Bin 2 2AxRg	Bin 3 3AxRg	Bin 4 4AxRg	Bin 5 2AxRg+Tr	Bin 6 3AxRg+Tr	Bin 7 Artic2Ax	Bin 8 Artic2Ax	Bin 9 Artic2Ax	Bin 10 Artic3Ax	Bin 11 Artic3Ax	Bin 12 2/3AxBus	Bin 13 >=7Ax/Un
00:00	5	5	0	0	0	0	0	0	0	0	0	0	0	0
01:00	6	6	0	0	0	0	0	0	0	0	0	0	0	0
02:00	3	3	0	0	0	0	0	0	0	0	0	0	0	0
03:00	2	2	0	0	0	0	0	0	0	0	0	0	0	0
04:00	2	2	0	0	0	0	0	0	0	0	0	0	0	0
05:00	4	4	0	0	0	0	0	0	0	0	0	0	0	0
06:00	5	5	0	0	0	0	0	0	0	0	0	0	0	0
07:00	2	2	0	0	0	0	0	0	0	0	0	0	0	0
08:00	10	10	0	0	0	0	0	0	0	0	0	0	0	0
09:00	19	18	0	0	1	0	0	0	0	0	0	0	0	0
10:00	16	16	0	0	0	0	0	0	0	0	0	0	0	0
11:00	28	28	0	0	0	0	0	0	0	0	0	0	0	0
12:00	50	49	0	0	0	0	0	0	0	1	0	0	0	0
13:00	45	45	0	0	0	0	0	0	0	0	0	0	0	0
14:00	41	41	0	0	0	0	0	0	0	0	0	0	0	0
15:00	39	39	0	0	0	0	0	0	0	0	0	0	0	0
16:00	48	48	0	0	0	0	0	0	0	0	0	0	0	0
17:00	33	32	1	0	0	0	0	0	0	0	0	0	0	0
18:00	20	19	0	0	1	0	0	0	0	0	0	0	0	0
19:00	18	17	1	0	0	0	0	0	0	0	0	0	0	0
20:00	12	8	0	0	4	0	0	0	0	0	0	0	0	0
21:00	12	12	0	0	0	0	0	0	0	0	0	0	0	0
22:00	3	1	0	0	2	0	0	0	0	0	0	0	0	0
23:00	4	4	0	0	0	0	0	0	0	0	0	0	0	0
Total														
12H(7-19)	351	347	1	0	2	0	0	0	0	1	0	0	0	0
16H(6-22)	398	389	2	0	6	0	0	0	0	1	0	0	0	0
18H(6-24)	405	394	2	0	8	0	0	0	0	1	0	0	0	0
24H(0-24)	427	416	2	0	8	0	0	0	0	1	0	0	0	0
AM Peak	11:00	11:00	11:00	11:00	09:00	11:00	11:00	11:00	11:00	11:00	11:00	11:00	11:00	11:00
	28	28	0	0	1	0	0	0	0	0	0	0	0	0
PM Peak	12:00	12:00	19:00	23:00	20:00	23:00	23:00	23:00	23:00	12:00	23:00	23:00	23:00	23:00
	50	49	1	0	4	0	0	0	0	1	0	0	0	0

VDA-pro R2 30/01/2018

Site No. 10218001 Site Ref. 10218001
B5301 Parsonby Brow Parsonby Wigton
Classification Report (Euro 13) 28 January 2018 Channel: Southbound

	Total Volume	Bin 1 Cr/LVn+T	Bin 2 2AxRg	Bin 3 3AxRg	Bin 4 4AxRg	Bin 5 2AxRg+Tr	Bin 6 3AxRg+Tr	Bin 7 Artic2Ax	Bin 8 Artic2Ax	Bin 9 Artic2Ax	Bin 10 Artic3Ax	Bin 11 Artic3Ax	Bin 12 2/3AxBus	Bin 13 >=7Ax/Un
00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:00	1	1	0	0	0	0	0	0	0	0	0	0	0	0
02:00	3	3	0	0	0	0	0	0	0	0	0	0	0	0
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:00	4	4	0	0	0	0	0	0	0	0	0	0	0	0
05:00	7	7	0	0	0	0	0	0	0	0	0	0	0	0
06:00	9	9	0	0	0	0	0	0	0	0	0	0	0	0
07:00	15	13	1	0	0	0	0	0	0	0	0	0	1	0
08:00	12	12	0	0	0	0	0	0	0	0	0	0	0	0
09:00	29	29	0	0	0	0	0	0	0	0	0	0	0	0
10:00	50	50	0	0	0	0	0	0	0	0	0	0	0	0
11:00	40	40	0	0	0	0	0	0	0	0	0	0	0	0
12:00	51	50	1	0	0	0	0	0	0	0	0	0	0	0
13:00	40	39	0	0	0	0	0	0	0	1	0	0	0	0
14:00	24	24	0	0	0	0	0	0	0	0	0	0	0	0
15:00	30	30	0	0	0	0	0	0	0	0	0	0	0	0
16:00	27	27	0	0	0	0	0	0	0	0	0	0	0	0
17:00	18	18	0	0	0	0	0	0	0	0	0	0	0	0
18:00	18	17	1	0	0	0	0	0	0	0	0	0	0	0
19:00	14	14	0	0	0	0	0	0	0	0	0	0	0	0
20:00	3	3	0	0	0	0	0	0	0	0	0	0	0	0
21:00	11	11	0	0	0	0	0	0	0	0	0	0	0	0
22:00	5	5	0	0	0	0	0	0	0	0	0	0	0	0
23:00	7	7	0	0	0	0	0	0	0	0	0	0	0	0
Total														
12H(7-19)	354	349	3	0	0	0	0	0	0	1	0	0	1	0
16H(6-22)	391	386	3	0	0	0	0	0	0	1	0	0	1	0
18H(6-24)	403	398	3	0	0	0	0	0	0	1	0	0	1	0
24H(0-24)	418	413	3	0	0	0	0	0	0	1	0	0	1	0
AM Peak	10:00	10:00	07:00	11:00	11:00	11:00	11:00	11:00	11:00	11:00	11:00	11:00	07:00	11:00
	50	50	1	0	0	0	0	0	0	0	0	0	1	0
PM Peak	12:00	12:00	18:00	23:00	23:00	23:00	23:00	23:00	23:00	13:00	23:00	23:00	23:00	23:00
	51	50	1	0	0	0	0	0	0	1	0	0	0	0

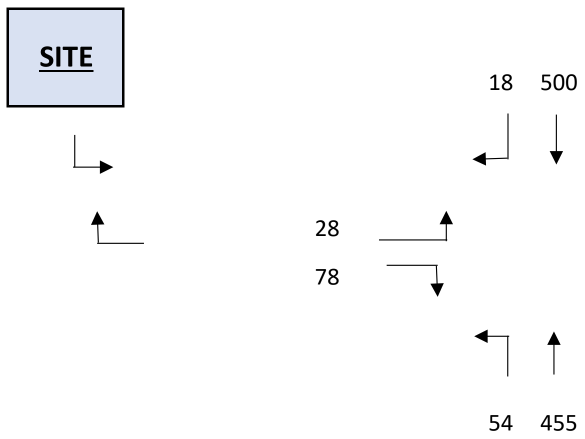
VDA-pro R2 30/01/2018

Site No. 10218001 Site Ref. 10218001
B5301 Parsonby Brow Parsonby Wigton
Classification Report (Euro 13) 28 January 2018 Channel: Total Flow

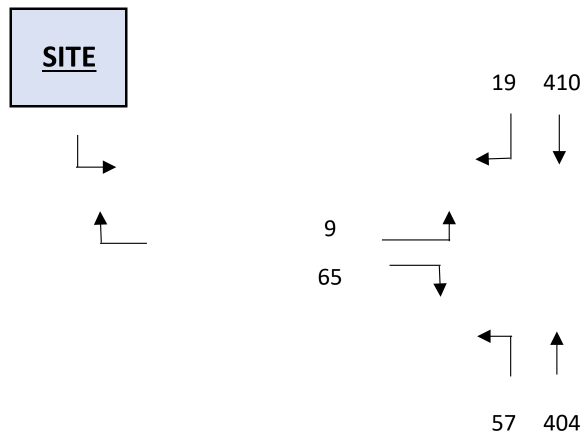
	Total Volume	Bin 1 Cr/LVn+T	Bin 2 2AxRg	Bin 3 3AxRg	Bin 4 4AxRg	Bin 5 2AxRg+Tr	Bin 6 3AxRg+Tr	Bin 7 Artic2Ax	Bin 8 Artic2Ax	Bin 9 Artic2Ax	Bin 10 Artic3Ax	Bin 11 Artic3Ax	Bin 12 2/3AxBus	Bin 13 >=7Ax/Un
00:00	5	5	0	0	0	0	0	0	0	0	0	0	0	0
01:00	7	7	0	0	0	0	0	0	0	0	0	0	0	0
02:00	6	6	0	0	0	0	0	0	0	0	0	0	0	0
03:00	2	2	0	0	0	0	0	0	0	0	0	0	0	0
04:00	6	6	0	0	0	0	0	0	0	0	0	0	0	0
05:00	11	11	0	0	0	0	0	0	0	0	0	0	0	0
06:00	14	14	0	0	0	0	0	0	0	0	0	0	0	0
07:00	17	15	1	0	0	0	0	0	0	0	0	0	1	0
08:00	22	22	0	0	0	0	0	0	0	0	0	0	0	0
09:00	48	47	0	0	1	0	0	0	0	0	0	0	0	0
10:00	66	66	0	0	0	0	0	0	0	0	0	0	0	0
11:00	68	68	0	0	0	0	0	0	0	0	0	0	0	0
12:00	101	99	1	0	0	0	0	0	0	1	0	0	0	0
13:00	85	84	0	0	0	0	0	0	0	1	0	0	0	0
14:00	65	65	0	0	0	0	0	0	0	0	0	0	0	0
15:00	69	69	0	0	0	0	0	0	0	0	0	0	0	0
16:00	75	75	0	0	0	0	0	0	0	0	0	0	0	0
17:00	51	50	1	0	0	0	0	0	0	0	0	0	0	0
18:00	38	36	1	0	1	0	0	0	0	0	0	0	0	0
19:00	32	31	1	0	0	0	0	0	0	0	0	0	0	0
20:00	15	11	0	0	4	0	0	0	0	0	0	0	0	0
21:00	23	23	0	0	0	0	0	0	0	0	0	0	0	0
22:00	8	6	0	0	2	0	0	0	0	0	0	0	0	0
23:00	11	11	0	0	0	0	0	0	0	0	0	0	0	0
Total														
12H(7-19)	705	696	4	0	2	0	0	0	0	2	0	0	1	0
16H(6-22)	789	775	5	0	6	0	0	0	0	2	0	0	1	0
18H(6-24)	808	792	5	0	8	0	0	0	0	2	0	0	1	0
24H(0-24)	845	829	5	0	8	0	0	0	0	2	0	0	1	0
AM Peak	11:00	11:00	07:00	11:00	09:00	11:00	11:00	11:00	11:00	11:00	11:00	11:00	07:00	11:00
	68	68	1	0	1	0	0	0	0	0	0	0	1	0
PM Peak	12:00	12:00	19:00	23:00	20:00	23:00	23:00	23:00	23:00	13:00	23:00	23:00	23:00	23:00
	101	99	1	0	4	0	0	0	0	1	0	0	0	0

VDA-pro R2 30/01/2018

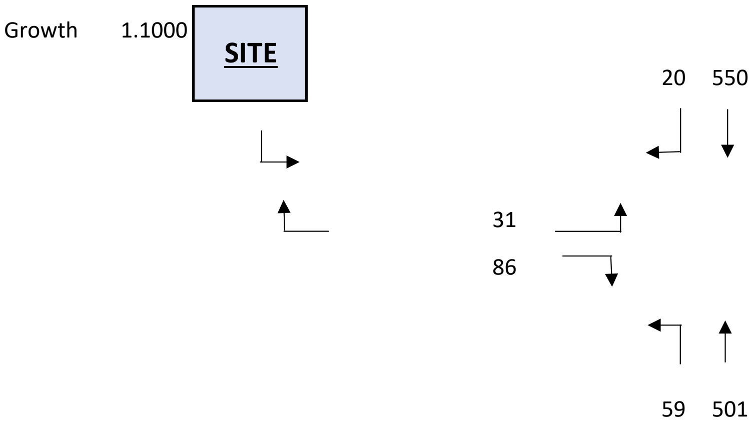
Base 2019 (AM)



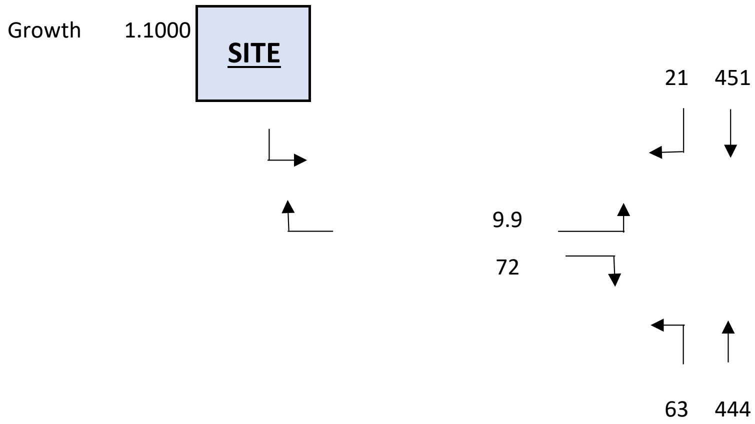
Base 2019 (PM)



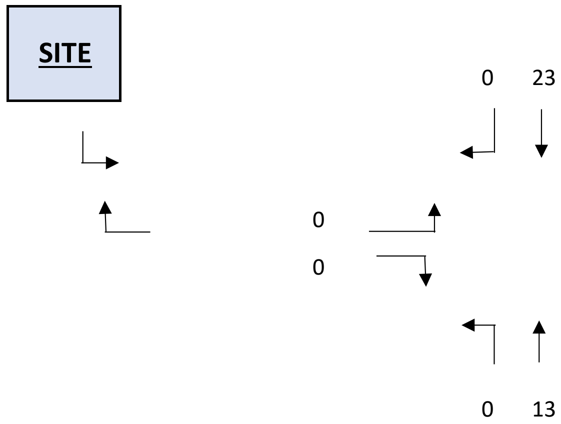
Base 2029 (AM)



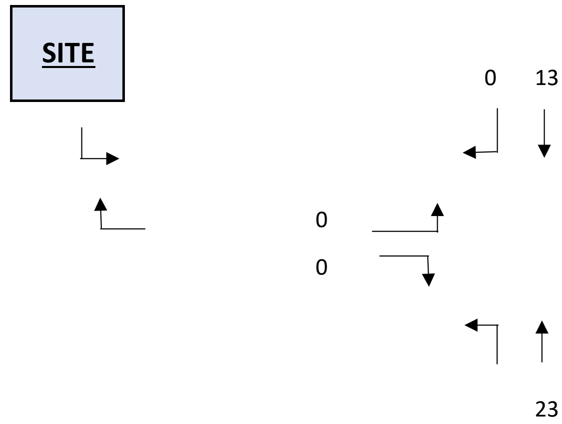
Base 2029 (PM)



Committed (AM)



Committed (PM)



HGV = 2.5pcu

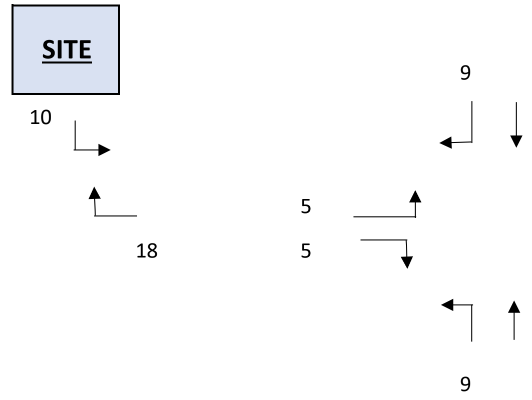
Total PCUs - AM Peak

5 'HGVs' + 10 staff arriving from Carlisle along A595	22.5 PCUs
5 'HGVs' departing to Carlisle along A595	12.5 PCUs
	35 PCUs

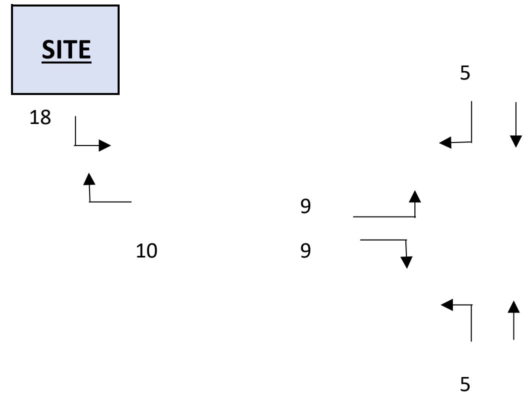
Total PCUs - PM Peak

5 'HGVs' + 10 staff departing towards Carlisle along A595	22.5 PCUs
5 'HGVs' arriving froms Carlisle along A595	12.5 PCUs
	35 PCUs

Development (AM)



Development (PM)



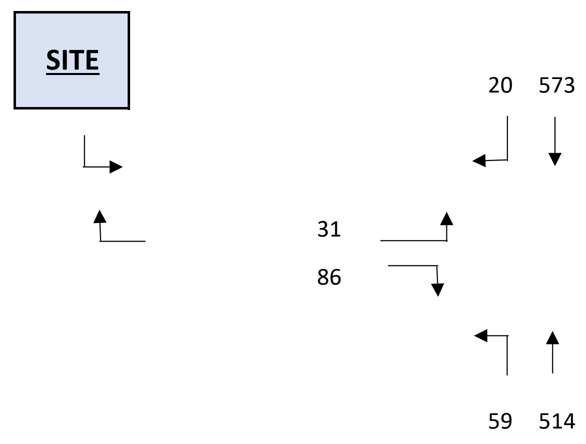
Total PCUs - AM Peak

2 'HGVs' + 4 staff arriving from Carlisle along A595	9 PCUs	HGV = 2.5pcu
2 'HGVs' departing to Carlisle along A595	5 PCUs	
2 'HGVs' + 4 staff arriving from Cockermouth	9 PCUs	
2 'HGVs' departing to Cockermouth	5 PCUs	
	28 PCUs	

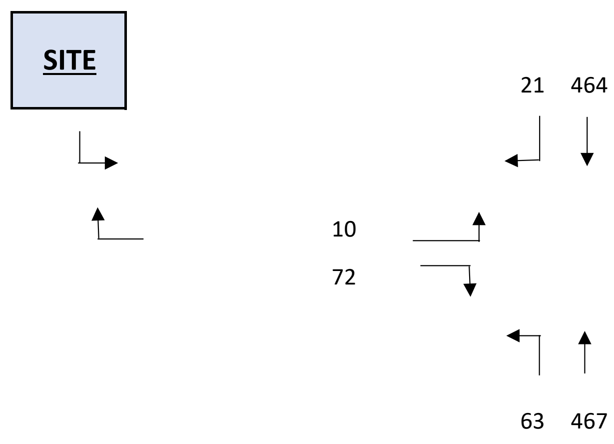
Total PCUs - PM Peak

2 'HGVs' + 4 staff departing towards Carlisle along A595	9 PCUs
2 'HGVs' arriving froms Carlisle along A595	5 PCUs
2 'HGVs' + 4 staff departing to Cockermouth	9 PCUs
2 'HGVs' arriving from Cockermouth	5 PCUs
	28

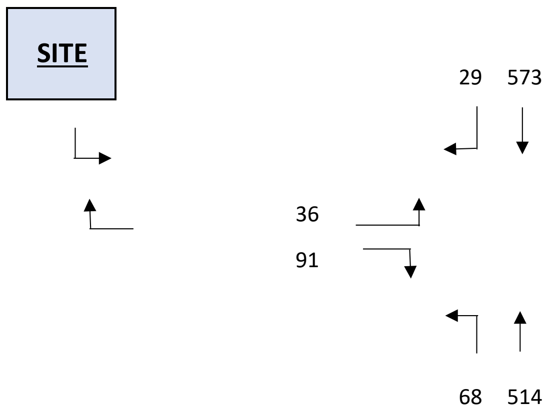
Base 2029+Committed (AM)



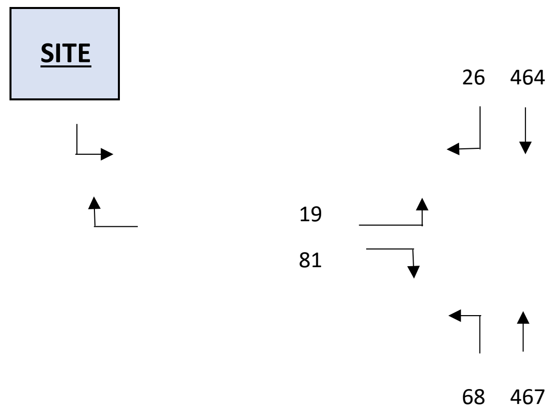
Base 2029+Committed (PM)



Base 2029+Committed+Development (AM)



Base 2029+Committed+Development (PM)



Junctions 9

PICADY 9 - Priority Intersection Module

Filename: B5301 A595.j9
Path: X:\iPRT Drive\amer\Projects\Archived Projects\665 High Close Quarry\04 Reports\05 Junctions Modelling\B5301 A595
Report generation date: 02/04/2020 13:41:33

Summary of junction performance

	AM			PM		
	Queue (PCU)	Delay (s)	RFC	Queue (PCU)	Delay (s)	RFC
	2019					
Stream B-C	0.1	8.09	0.06	0.0	8.49	0.02
Stream B-A	0.3	13.74	0.23	0.2	10.69	0.17
Stream C-AB	0.1	5.37	0.06	0.1	5.08	0.05
	2029					
Stream B-C	0.1	8.48	0.07	0.0	8.76	0.02
Stream B-A	0.4	15.49	0.27	0.3	11.65	0.20
Stream C-AB	0.1	5.25	0.07	0.1	5.00	0.06
	2019+Comm					
Stream B-C	0.1	8.16	0.06	0.0	8.60	0.02
Stream B-A	0.3	14.14	0.23	0.2	10.99	0.17
Stream C-AB	0.1	5.33	0.06	0.1	5.08	0.06
	2029+Comm					
Stream B-C	0.1	8.56	0.07	0.0	8.88	0.02
Stream B-A	0.4	15.99	0.27	0.3	12.01	0.20
Stream C-AB	0.1	5.21	0.07	0.1	5.00	0.06
	2029+Comm+Dev					
Stream B-C	0.1	8.87	0.08	0.1	9.20	0.04
Stream B-A	0.5	17.07	0.30	0.3	13.29	0.23
Stream C-AB	0.3	5.45	0.10	0.2	5.21	0.08

There are warnings associated with one or more model runs - see the 'Data Errors and Warnings' tables for each Analysis or Demand Set.

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle.

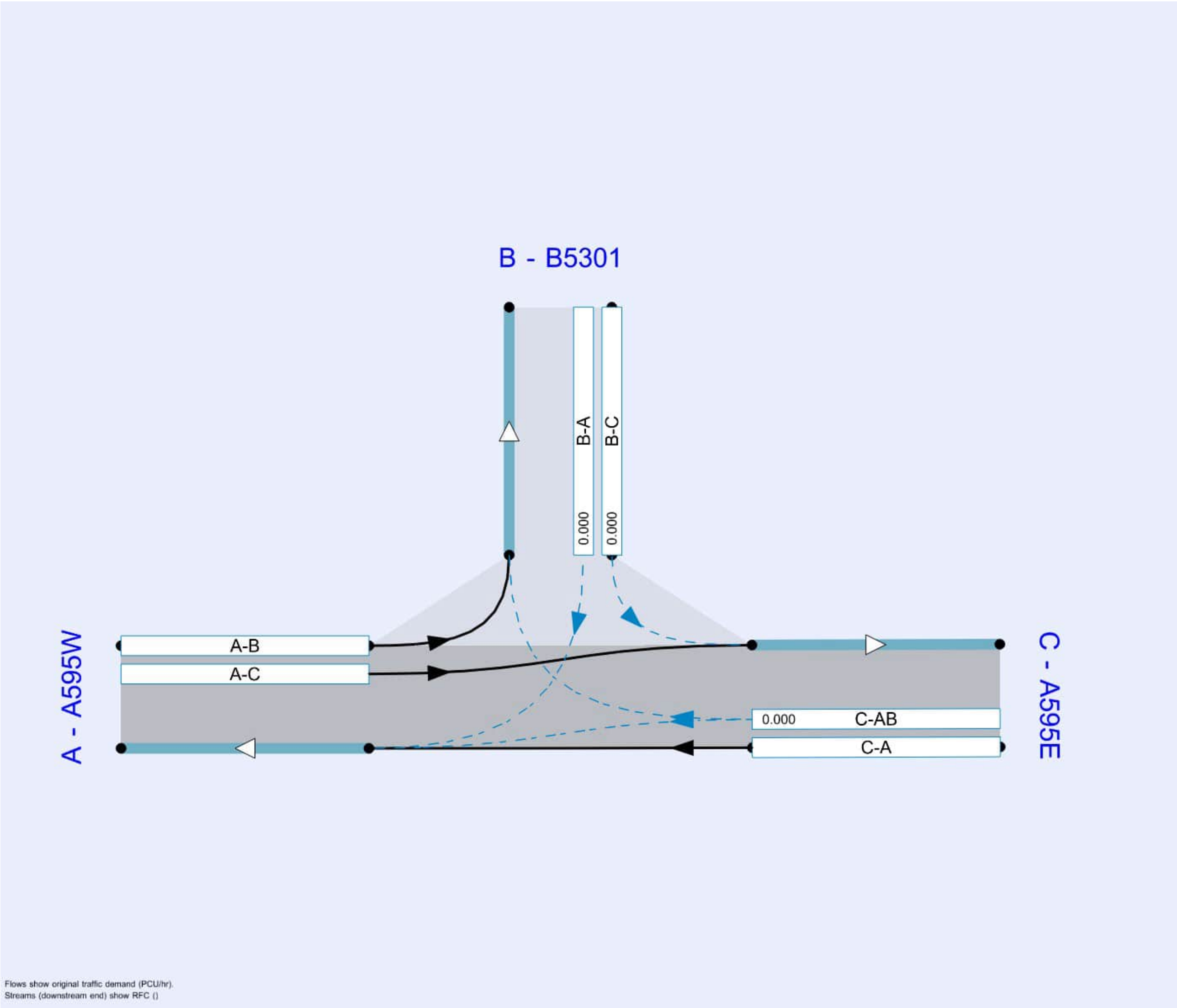
File summary

File Description

Title	
Location	
Site number	
Date	11/01/2020
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	DESKTOP-QNVH2TL\Amer
Description	

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
m	kph	PCU	PCU	perHour	s	-Min	perMin



The junction diagram reflects the last run of Junctions.

Analysis Options

Vehicle length (m)	Calculate Queue Percentiles	Calculate detailed queueing delay	Calculate residual capacity	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)
5.75				0.85	36.00	20.00

Demand Set Summary

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically	Relationship type	Relationship
D1	2019	AM	ONE HOUR	00:00	01:30	15	✓		
D2	2019	PM	ONE HOUR	00:00	01:30	15	✓		
D3	2029	AM	ONE HOUR	00:00	01:30	15	✓	Simple	D1*1.1
D4	2029	PM	ONE HOUR	00:00	01:30	15	✓	Simple	D2*1.1
D5	Committed	AM	ONE HOUR	00:00	01:30	15			
D6	Committed	PM	ONE HOUR	00:00	01:30	15			
D7	Dev	AM	ONE HOUR	00:00	01:30	15			
D8	Dev	PM	ONE HOUR	00:00	01:30	15			
D9	2019+Comm	AM	ONE HOUR	00:00	01:30	15	✓	Simple	D1+D5
D10	2019+Comm	PM	ONE HOUR	00:00	01:30	15	✓	Simple	D2+D6
D11	2029+Comm	AM	ONE HOUR	00:00	01:30	15	✓	Simple	D3+D5
D12	2029+Comm	PM	ONE HOUR	00:00	01:30	15	✓	Simple	D4+D6
D13	2029+Comm+Dev	AM	ONE HOUR	00:00	01:30	15	✓	Simple	D3+D5+D7
D14	2029+Comm+Dev	PM	ONE HOUR	00:00	01:30	15	✓	Simple	D4+D6+D8

Analysis Set Details

ID	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	✓	100.000	100.000

2019, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Demand Set Relationship	D11 - 2029+Comm , AM	Demand Set relationships are chained. This may slow down the file.

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		1.34	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description	Arm type
A	A595W		Major
B	B5301		Minor
C	A595E		Major

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Has right turn bay	Visibility for right turn (m)	Blocks?	Blocking queue (PCU)
C - A595E	7.30			100.0	✓	0.00

Geometries for Arm C are measured opposite Arm B. Geometries for Arm A (if relevant) are measured opposite Arm D.

Minor Arm Geometry

Arm	Minor arm type	Width at give-way (m)	Width at 5m (m)	Width at 10m (m)	Width at 15m (m)	Width at 20m (m)	Estimate flare length	Flare length (PCU)	Visibility to left (m)	Visibility to right (m)
B - B5301	One lane plus flare	10.00	5.50	4.50	4.20	3.70	✓	2.00	100	90

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
B-A	618	0.106	0.268	0.169	0.383
B-C	650	0.094	0.238	-	-
C-B	632	0.231	0.231	-	-

The slopes and intercepts shown above do NOT include any corrections or adjustments.

Streams may be combined, in which case capacity will be adjusted.

Values are shown for the first time segment only; they may differ for subsequent time segments.

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D1	2019	AM	ONE HOUR	00:00	01:30	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A - A595W		ONE HOUR	✓	509	100.000
B - B5301		ONE HOUR	✓	106	100.000
C - A595E		ONE HOUR	✓	518	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A - A595W	B - B5301	C - A595E
From	A - A595W	0	54	455
	B - B5301	78	0	28
	C - A595E	500	18	0

Proportions

		To		
		A - A595W	B - B5301	C - A595E
From	A - A595W	0.00	0.11	0.89
	B - B5301	0.74	0.00	0.26
	C - A595E	0.97	0.03	0.00

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A - A595W	B - B5301	C - A595E
From	A - A595W	0	8	5
	B - B5301	11	0	4
	C - A595E	10	23	0

Average PCU Per Veh

		To		
		A - A595W	B - B5301	C - A595E
From	A - A595W	1.000	1.080	1.050
	B - B5301	1.110	1.000	1.040
	C - A595E	1.100	1.230	1.000

Detailed Demand Data

Demand for each time segment

Time Segment	Arm	Demand (PCU/hr)	Demand in PCU (PCU/hr)
00:00-00:15	A - A595W	383	383
	B - B5301	80	80
	C - A595E	390	390
00:15-00:30	A - A595W	458	458
	B - B5301	95	95
	C - A595E	466	466
00:30-00:45	A - A595W	560	560
	B - B5301	117	117
	C - A595E	570	570
00:45-01:00	A - A595W	560	560
	B - B5301	117	117
	C - A595E	570	570
01:00-01:15	A - A595W	458	458
	B - B5301	95	95
	C - A595E	466	466
01:15-01:30	A - A595W	383	383
	B - B5301	80	80
	C - A595E	390	390

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-C	0.06	8.09	0.1	A	26	39
B-A	0.23	13.74	0.3	B	72	107
C-AB	0.06	5.37	0.1	A	37	56
C-A					438	657
A-B					50	74
A-C					418	626

Main Results for each time segment

00:00 - 00:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	21	5	546	0.039	21	0.0	0.0	7.127	A
B-A	59	15	453	0.130	58	0.0	0.2	10.105	B
C-AB	25	6	806	0.032	25	0.0	0.0	5.374	A
C-A	365	91			365				
A-B	41	10			41				
A-C	343	86			343				

00:15 - 00:30

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	25	6	525	0.048	25	0.0	0.1	7.496	A
B-A	70	18	421	0.167	70	0.2	0.2	11.378	B
C-AB	35	9	844	0.041	35	0.0	0.1	5.161	A
C-A	431	108			431				
A-B	49	12			49				
A-C	409	102			409				

00:30 - 00:45

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	31	8	494	0.062	31	0.1	0.1	8.088	A
B-A	86	21	377	0.228	85	0.2	0.3	13.708	B
C-AB	51	13	899	0.057	51	0.1	0.1	4.886	A
C-A	519	130			519				
A-B	59	15			59				
A-C	501	125			501				

00:45 - 01:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	31	8	493	0.062	31	0.1	0.1	8.094	A
B-A	86	21	377	0.228	86	0.3	0.3	13.744	B
C-AB	51	13	899	0.057	51	0.1	0.1	4.869	A
C-A	519	130			519				
A-B	59	15			59				
A-C	501	125			501				

01:00 - 01:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	25	6	524	0.048	25	0.1	0.1	7.507	A
B-A	70	18	421	0.167	71	0.3	0.2	11.418	B
C-AB	35	9	844	0.041	35	0.1	0.1	5.118	A
C-A	431	108			431				
A-B	49	12			49				
A-C	409	102			409				

01:15 - 01:30

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	21	5	546	0.039	21	0.1	0.0	7.137	A
B-A	59	15	453	0.130	59	0.2	0.2	10.147	B
C-AB	26	6	806	0.032	26	0.1	0.0	5.353	A
C-A	364	91			364				
A-B	41	10			41				
A-C	343	86			343				

2019, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Demand Set Relationship	D11 - 2029+Comm , AM	Demand Set relationships are chained. This may slow down the file.

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		0.99	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D2	2019	PM	ONE HOUR	00:00	01:30	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A - A595W		ONE HOUR	✓	461	100.000
B - B5301		ONE HOUR	✓	74	100.000
C - A595E		ONE HOUR	✓	429	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A - A595W	B - B5301	C - A595E
From	A - A595W	0	57	404
	B - B5301	65	0	9
	C - A595E	410	19	0

Proportions

		To		
		A - A595W	B - B5301	C - A595E
From	A - A595W	0.00	0.12	0.88
	B - B5301	0.88	0.00	0.12
	C - A595E	0.96	0.04	0.00

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A - A595W	B - B5301	C - A595E
From	A - A595W	0	8	38
	B - B5301	5	0	13
	C - A595E	3	6	0

Average PCU Per Veh

		To		
		A - A595W	B - B5301	C - A595E
From	A - A595W	1.000	1.080	1.380
	B - B5301	1.050	1.000	1.130
	C - A595E	1.030	1.060	1.000

Detailed Demand Data

Demand for each time segment

Time Segment	Arm	Demand (PCU/hr)	Demand in PCU (PCU/hr)
00:00-00:15	A - A595W	347	347
	B - B5301	56	56
	C - A595E	323	323
00:15-00:30	A - A595W	414	414
	B - B5301	67	67
	C - A595E	386	386
00:30-00:45	A - A595W	508	508
	B - B5301	81	81
	C - A595E	472	472
00:45-01:00	A - A595W	508	508
	B - B5301	81	81
	C - A595E	472	472
01:00-01:15	A - A595W	414	414
	B - B5301	67	67
	C - A595E	386	386
01:15-01:30	A - A595W	347	347
	B - B5301	56	56
	C - A595E	323	323

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-C	0.02	8.49	0.0	A	8	12
B-A	0.17	10.69	0.2	B	60	89
C-AB	0.05	5.08	0.1	A	34	51
C-A					360	540
A-B					52	78
A-C					371	556

Main Results for each time segment

00:00 - 00:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	7	2	531	0.013	7	0.0	0.0	7.753	A
B-A	49	12	494	0.099	48	0.0	0.1	8.468	A
C-AB	24	6	766	0.031	24	0.0	0.0	5.084	A
C-A	299	75			299				
A-B	43	11			43				
A-C	304	76			304				

00:15 - 00:30

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	8	2	514	0.016	8	0.0	0.0	8.043	A
B-A	58	15	465	0.126	58	0.1	0.1	9.286	A
C-AB	32	8	795	0.040	32	0.0	0.1	4.937	A
C-A	354	88			354				
A-B	51	13			51				
A-C	363	91			363				

00:30 - 00:45

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	10	2	489	0.020	10	0.0	0.0	8.488	A
B-A	72	18	425	0.168	71	0.1	0.2	10.680	B
C-AB	46	11	837	0.054	45	0.1	0.1	4.750	A
C-A	427	107			427				
A-B	63	16			63				
A-C	445	111			445				

00:45 - 01:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	10	2	489	0.020	10	0.0	0.0	8.490	A
B-A	72	18	425	0.168	72	0.2	0.2	10.695	B
C-AB	46	11	837	0.054	46	0.1	0.1	4.747	A
C-A	427	107			427				
A-B	63	16			63				
A-C	445	111			445				

01:00 - 01:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	8	2	514	0.016	8	0.0	0.0	8.046	A
B-A	58	15	465	0.126	59	0.2	0.2	9.302	A
C-AB	32	8	795	0.040	32	0.1	0.1	4.930	A
C-A	354	88			354				
A-B	51	13			51				
A-C	363	91			363				

01:15 - 01:30

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	7	2	531	0.013	7	0.0	0.0	7.759	A
B-A	49	12	494	0.099	49	0.2	0.1	8.493	A
C-AB	24	6	766	0.031	24	0.1	0.0	5.081	A
C-A	299	75			299				
A-B	43	11			43				
A-C	304	76			304				

2029, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Demand Set Relationship	D11 - 2029+Comm , AM	Demand Set relationships are chained. This may slow down the file.

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		1.48	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically	Relationship type	Relationship
D3	2029	AM	ONE HOUR	00:00	01:30	15	✓	Simple	D1*1.1

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A - A595W		ONE HOUR	✓	560	100.000
B - B5301		ONE HOUR	✓	117	100.000
C - A595E		ONE HOUR	✓	570	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A - A595W	B - B5301	C - A595E
From	A - A595W	0	59	501
	B - B5301	86	0	31
	C - A595E	550	20	0

Proportions

		To		
		A - A595W	B - B5301	C - A595E
From	A - A595W	0.00	0.11	0.89
	B - B5301	0.74	0.00	0.26
	C - A595E	0.97	0.03	0.00

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A - A595W	B - B5301	C - A595E
From	A - A595W	0	8	5
	B - B5301	11	0	4
	C - A595E	10	23	0

Average PCU Per Veh

		To		
		A - A595W	B - B5301	C - A595E
From	A - A595W	1.000	1.080	1.050
	B - B5301	1.110	1.000	1.040
	C - A595E	1.100	1.230	1.000

Detailed Demand Data

Demand for each time segment

Time Segment	Arm	Demand (PCU/hr)	Demand in PCU (PCU/hr)
00:00-00:15	A - A595W	422	422
	B - B5301	88	88
	C - A595E	429	429
00:15-00:30	A - A595W	503	503
	B - B5301	105	105
	C - A595E	512	512
00:30-00:45	A - A595W	616	616
	B - B5301	128	128
	C - A595E	627	627
00:45-01:00	A - A595W	616	616
	B - B5301	128	128
	C - A595E	627	627
01:00-01:15	A - A595W	503	503
	B - B5301	105	105
	C - A595E	512	512
01:15-01:30	A - A595W	422	422
	B - B5301	88	88
	C - A595E	429	429

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-C	0.07	8.48	0.1	A	28	42
B-A	0.27	15.49	0.4	C	79	118
C-AB	0.07	5.25	0.1	A	45	67
C-A					478	717
A-B					55	82
A-C					459	689

Main Results for each time segment

00:00 - 00:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	23	6	535	0.043	23	0.0	0.0	7.307	A
B-A	65	16	436	0.148	64	0.0	0.2	10.705	B
C-AB	30	7	826	0.036	30	0.0	0.1	5.250	A
C-A	399	100			399				
A-B	45	11			45				
A-C	377	94			377				

00:15 - 00:30

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	28	7	511	0.054	28	0.0	0.1	7.744	A
B-A	77	19	401	0.192	77	0.2	0.3	12.309	B
C-AB	41	10	869	0.048	41	0.1	0.1	5.032	A
C-A	471	118			471				
A-B	53	13			53				
A-C	450	112			450				

00:30 - 00:45

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	34	8	476	0.071	34	0.1	0.1	8.474	A
B-A	94	24	352	0.268	94	0.3	0.4	15.424	C
C-AB	63	16	931	0.067	63	0.1	0.1	4.755	A
C-A	565	141			565				
A-B	65	16			65				
A-C	551	138			551				

00:45 - 01:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	34	8	475	0.071	34	0.1	0.1	8.482	A
B-A	94	24	352	0.268	94	0.4	0.4	15.486	C
C-AB	63	16	931	0.067	63	0.1	0.1	4.740	A
C-A	565	141			565				
A-B	65	16			65				
A-C	551	138			551				

01:00 - 01:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	28	7	510	0.054	28	0.1	0.1	7.758	A
B-A	77	19	401	0.192	78	0.4	0.3	12.371	B
C-AB	42	10	869	0.048	42	0.1	0.1	4.989	A
C-A	471	118			471				
A-B	53	13			53				
A-C	450	112			450				

01:15 - 01:30

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	23	6	535	0.043	23	0.1	0.0	7.320	A
B-A	65	16	436	0.148	65	0.3	0.2	10.764	B
C-AB	30	8	826	0.036	30	0.1	0.1	5.229	A
C-A	399	100			399				
A-B	45	11			45				
A-C	377	94			377				

2029, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Demand Set Relationship	D11 - 2029+Comm , AM	Demand Set relationships are chained. This may slow down the file.

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		1.07	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically	Relationship type	Relationship
D4	2029	PM	ONE HOUR	00:00	01:30	15	✓	Simple	D2*1.1

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A - A595W		ONE HOUR	✓	507	100.000
B - B5301		ONE HOUR	✓	81	100.000
C - A595E		ONE HOUR	✓	472	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A - A595W	B - B5301	C - A595E
From	A - A595W	0	63	444
	B - B5301	72	0	10
	C - A595E	451	21	0

Proportions

		To		
		A - A595W	B - B5301	C - A595E
From	A - A595W	0.00	0.12	0.88
	B - B5301	0.88	0.00	0.12
	C - A595E	0.96	0.04	0.00

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A - A595W	B - B5301	C - A595E
From	A - A595W	0	8	38
	B - B5301	5	0	13
	C - A595E	3	6	0

Average PCU Per Veh

		To		
		A - A595W	B - B5301	C - A595E
From	A - A595W	1.000	1.080	1.380
	B - B5301	1.050	1.000	1.130
	C - A595E	1.030	1.060	1.000

Detailed Demand Data

Demand for each time segment

Time Segment	Arm	Demand (PCU/hr)	Demand in PCU (PCU/hr)
00:00-00:15	A - A595W	382	382
	B - B5301	61	61
	C - A595E	355	355
00:15-00:30	A - A595W	456	456
	B - B5301	73	73
	C - A595E	424	424
00:30-00:45	A - A595W	558	558
	B - B5301	90	90
	C - A595E	520	520
00:45-01:00	A - A595W	558	558
	B - B5301	90	90
	C - A595E	520	520
01:00-01:15	A - A595W	456	456
	B - B5301	73	73
	C - A595E	424	424
01:15-01:30	A - A595W	382	382
	B - B5301	61	61
	C - A595E	355	355

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-C	0.02	8.76	0.0	A	9	14
B-A	0.20	11.65	0.3	B	66	98
C-AB	0.06	5.00	0.1	A	40	60
C-A					393	589
A-B					58	86
A-C					408	612

Main Results for each time segment

00:00 - 00:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	7	2	522	0.014	7	0.0	0.0	7.897	A
B-A	54	13	479	0.112	53	0.0	0.1	8.861	A
C-AB	28	7	781	0.036	28	0.0	0.1	5.003	A
C-A	327	82			327				
A-B	47	12			47				
A-C	335	84			335				

00:15 - 00:30

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	9	2	503	0.018	9	0.0	0.0	8.233	A
B-A	64	16	447	0.144	64	0.1	0.2	9.859	A
C-AB	38	9	813	0.046	37	0.1	0.1	4.851	A
C-A	387	97			387				
A-B	56	14			56				
A-C	400	100			400				

00:30 - 00:45

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	11	3	475	0.023	11	0.0	0.0	8.762	A
B-A	79	20	403	0.195	78	0.2	0.3	11.633	B
C-AB	55	14	861	0.063	54	0.1	0.1	4.660	A
C-A	465	116			465				
A-B	69	17			69				
A-C	489	122			489				

00:45 - 01:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	11	3	475	0.023	11	0.0	0.0	8.764	A
B-A	79	20	403	0.195	79	0.3	0.3	11.654	B
C-AB	55	14	861	0.063	55	0.1	0.1	4.657	A
C-A	465	116			465				
A-B	69	17			69				
A-C	489	122			489				

01:00 - 01:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	9	2	503	0.018	9	0.0	0.0	8.239	A
B-A	64	16	447	0.144	65	0.3	0.2	9.883	A
C-AB	38	9	814	0.046	38	0.1	0.1	4.842	A
C-A	387	97			387				
A-B	56	14			56				
A-C	400	100			400				

01:15 - 01:30

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	7	2	522	0.014	7	0.0	0.0	7.904	A
B-A	54	13	479	0.112	54	0.2	0.1	8.890	A
C-AB	28	7	781	0.036	28	0.1	0.1	5.003	A
C-A	327	82			327				
A-B	47	12			47				
A-C	335	84			335				

2019+Comm, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Demand Set Relationship	D11 - 2029+Comm , AM	Demand Set relationships are chained. This may slow down the file.

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		1.33	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically	Relationship type	Relationship
D9	2019+Comm	AM	ONE HOUR	00:00	01:30	15	✓	Simple	D1+D5

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A - A595W		ONE HOUR	✓	522	100.000
B - B5301		ONE HOUR	✓	106	100.000
C - A595E		ONE HOUR	✓	541	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A - A595W	B - B5301	C - A595E
From	A - A595W	0	54	468
	B - B5301	78	0	28
	C - A595E	523	18	0

Proportions

		To		
		A - A595W	B - B5301	C - A595E
From	A - A595W	0.00	0.10	0.90
	B - B5301	0.74	0.00	0.26
	C - A595E	0.97	0.03	0.00

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A - A595W	B - B5301	C - A595E
From	A - A595W	0	8	6
	B - B5301	11	0	4
	C - A595E	11	23	0

Average PCU Per Veh

		To		
		A - A595W	B - B5301	C - A595E
From	A - A595W	1.000	1.080	1.059
	B - B5301	1.110	1.000	1.040
	C - A595E	1.113	1.230	1.000

Detailed Demand Data

Demand for each time segment

Time Segment	Arm	Demand (PCU/hr)	Demand in PCU (PCU/hr)
00:00-00:15	A - A595W	393	393
	B - B5301	80	80
	C - A595E	407	407
00:15-00:30	A - A595W	469	469
	B - B5301	95	95
	C - A595E	486	486
00:30-00:45	A - A595W	575	575
	B - B5301	117	117
	C - A595E	596	596
00:45-01:00	A - A595W	575	575
	B - B5301	117	117
	C - A595E	596	596
01:00-01:15	A - A595W	469	469
	B - B5301	95	95
	C - A595E	486	486
01:15-01:30	A - A595W	393	393
	B - B5301	80	80
	C - A595E	407	407

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-C	0.06	8.16	0.1	A	26	39
B-A	0.23	14.14	0.3	B	72	107
C-AB	0.06	5.33	0.1	A	39	58
C-A					458	687
A-B					50	74
A-C					429	644

Main Results for each time segment

00:00 - 00:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	21	5	544	0.039	21	0.0	0.0	7.161	A
B-A	59	15	447	0.131	58	0.0	0.2	10.248	B
C-AB	26	7	816	0.032	26	0.0	0.0	5.332	A
C-A	381	95			381				
A-B	41	10			41				
A-C	352	88			352				

00:15 - 00:30

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	25	6	521	0.048	25	0.0	0.1	7.542	A
B-A	70	18	414	0.169	70	0.2	0.2	11.597	B
C-AB	36	9	857	0.042	36	0.0	0.1	5.113	A
C-A	450	113			450				
A-B	49	12			49				
A-C	421	105			421				

00:30 - 00:45

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	31	8	490	0.063	31	0.1	0.1	8.158	A
B-A	86	21	368	0.233	85	0.2	0.3	14.099	B
C-AB	54	13	915	0.059	53	0.1	0.1	4.835	A
C-A	542	135			542				
A-B	59	15			59				
A-C	515	129			515				

00:45 - 01:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	31	8	489	0.063	31	0.1	0.1	8.165	A
B-A	86	21	368	0.233	86	0.3	0.3	14.139	B
C-AB	54	13	915	0.059	54	0.1	0.1	4.821	A
C-A	542	135			542				
A-B	59	15			59				
A-C	515	129			515				

01:00 - 01:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	25	6	521	0.048	25	0.1	0.1	7.554	A
B-A	70	18	414	0.169	71	0.3	0.2	11.637	B
C-AB	36	9	857	0.042	36	0.1	0.1	5.077	A
C-A	450	113			450				
A-B	49	12			49				
A-C	421	105			421				

01:15 - 01:30

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	21	5	543	0.039	21	0.1	0.0	7.174	A
B-A	59	15	447	0.131	59	0.2	0.2	10.295	B
C-AB	26	7	817	0.032	26	0.1	0.1	5.311	A
C-A	381	95			381				
A-B	41	10			41				
A-C	352	88			352				

2019+Comm, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Demand Set Relationship	D11 - 2029+Comm , AM	Demand Set relationships are chained. This may slow down the file.

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		0.98	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically	Relationship type	Relationship
D10	2019+Comm	PM	ONE HOUR	00:00	01:30	15	✓	Simple	D2+D6

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A - A595W		ONE HOUR	✓	484	100.000
B - B5301		ONE HOUR	✓	74	100.000
C - A595E		ONE HOUR	✓	442	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A - A595W	B - B5301	C - A595E
From	A - A595W	0	57	427
	B - B5301	65	0	9
	C - A595E	423	19	0

Proportions

		To		
		A - A595W	B - B5301	C - A595E
From	A - A595W	0.00	0.12	0.88
	B - B5301	0.88	0.00	0.12
	C - A595E	0.96	0.04	0.00

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A - A595W	B - B5301	C - A595E
From	A - A595W	0	8	39
	B - B5301	5	0	13
	C - A595E	4	6	0

Average PCU Per Veh

		To		
		A - A595W	B - B5301	C - A595E
From	A - A595W	1.000	1.080	1.386
	B - B5301	1.050	1.000	1.130
	C - A595E	1.040	1.060	1.000

Detailed Demand Data

Demand for each time segment

Time Segment	Arm	Demand (PCU/hr)	Demand in PCU (PCU/hr)
00:00-00:15	A - A595W	364	364
	B - B5301	56	56
	C - A595E	333	333
00:15-00:30	A - A595W	435	435
	B - B5301	67	67
	C - A595E	397	397
00:30-00:45	A - A595W	533	533
	B - B5301	81	81
	C - A595E	487	487
00:45-01:00	A - A595W	533	533
	B - B5301	81	81
	C - A595E	487	487
01:00-01:15	A - A595W	435	435
	B - B5301	67	67
	C - A595E	397	397
01:15-01:30	A - A595W	364	364
	B - B5301	56	56
	C - A595E	333	333

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-C	0.02	8.60	0.0	A	8	12
B-A	0.17	10.99	0.2	B	60	89
C-AB	0.06	5.08	0.1	A	35	52
C-A					371	556
A-B					52	78
A-C					392	588

Main Results for each time segment

00:00 - 00:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	7	2	527	0.013	7	0.0	0.0	7.812	A
B-A	49	12	488	0.100	48	0.0	0.1	8.595	A
C-AB	24	6	769	0.032	24	0.0	0.0	5.082	A
C-A	308	77			308				
A-B	43	11			43				
A-C	321	80			321				

00:15 - 00:30

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	8	2	509	0.016	8	0.0	0.0	8.120	A
B-A	58	15	457	0.128	58	0.1	0.2	9.468	A
C-AB	33	8	799	0.041	33	0.0	0.1	4.933	A
C-A	365	91			365				
A-B	51	13			51				
A-C	384	96			384				

00:30 - 00:45

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	10	2	483	0.021	10	0.0	0.0	8.596	A
B-A	72	18	415	0.172	71	0.2	0.2	10.978	B
C-AB	47	12	843	0.056	47	0.1	0.1	4.745	A
C-A	440	110			440				
A-B	63	16			63				
A-C	470	118			470				

00:45 - 01:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	10	2	483	0.021	10	0.0	0.0	8.598	A
B-A	72	18	415	0.172	72	0.2	0.2	10.994	B
C-AB	47	12	843	0.056	47	0.1	0.1	4.744	A
C-A	440	110			440				
A-B	63	16			63				
A-C	470	118			470				

01:00 - 01:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	8	2	509	0.016	8	0.0	0.0	8.125	A
B-A	58	15	457	0.128	59	0.2	0.2	9.488	A
C-AB	33	8	800	0.041	33	0.1	0.1	4.930	A
C-A	365	91			365				
A-B	51	13			51				
A-C	384	96			384				

01:15 - 01:30

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	7	2	527	0.013	7	0.0	0.0	7.817	A
B-A	49	12	488	0.100	49	0.2	0.1	8.620	A
C-AB	25	6	769	0.032	25	0.1	0.0	5.079	A
C-A	308	77			308				
A-B	43	11			43				
A-C	321	80			321				

2029+Comm , AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Demand Set Relationship	D11 - 2029+Comm , AM	Demand Set relationships are chained. This may slow down the file.

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		1.48	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically	Relationship type	Relationship
D11	2029+Comm	AM	ONE HOUR	00:00	01:30	15	✓	Simple	D3+D5

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A - A595W		ONE HOUR	✓	573	100.000
B - B5301		ONE HOUR	✓	117	100.000
C - A595E		ONE HOUR	✓	593	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A - A595W	B - B5301	C - A595E
From	A - A595W	0	59	514
	B - B5301	86	0	31
	C - A595E	573	20	0

Proportions

		To		
		A - A595W	B - B5301	C - A595E
From	A - A595W	0.00	0.10	0.90
	B - B5301	0.74	0.00	0.26
	C - A595E	0.97	0.03	0.00

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A - A595W	B - B5301	C - A595E
From	A - A595W	0	8	6
	B - B5301	11	0	4
	C - A595E	11	23	0

Average PCU Per Veh

		To		
		A - A595W	B - B5301	C - A595E
From	A - A595W	1.000	1.080	1.058
	B - B5301	1.110	1.000	1.040
	C - A595E	1.112	1.230	1.000

Detailed Demand Data

Demand for each time segment

Time Segment	Arm	Demand (PCU/hr)	Demand in PCU (PCU/hr)
00:00-00:15	A - A595W	431	431
	B - B5301	88	88
	C - A595E	446	446
00:15-00:30	A - A595W	515	515
	B - B5301	105	105
	C - A595E	533	533
00:30-00:45	A - A595W	631	631
	B - B5301	128	128
	C - A595E	653	653
00:45-01:00	A - A595W	631	631
	B - B5301	128	128
	C - A595E	653	653
01:00-01:15	A - A595W	515	515
	B - B5301	105	105
	C - A595E	533	533
01:15-01:30	A - A595W	431	431
	B - B5301	88	88
	C - A595E	446	446

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-C	0.07	8.56	0.1	A	28	42
B-A	0.27	15.99	0.4	C	79	118
C-AB	0.07	5.21	0.1	A	47	70
C-A					497	746
A-B					55	82
A-C					471	707

Main Results for each time segment

00:00 - 00:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	23	6	533	0.044	23	0.0	0.0	7.344	A
B-A	65	16	431	0.150	64	0.0	0.2	10.865	B
C-AB	31	8	836	0.037	31	0.0	0.1	5.210	A
C-A	415	104			415				
A-B	45	11			45				
A-C	387	97			387				

00:15 - 00:30

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	28	7	508	0.055	28	0.0	0.1	7.795	A
B-A	77	19	395	0.196	77	0.2	0.3	12.566	B
C-AB	43	11	881	0.049	43	0.1	0.1	4.987	A
C-A	490	122			490				
A-B	53	13			53				
A-C	462	115			462				

00:30 - 00:45

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	34	8	471	0.072	34	0.1	0.1	8.556	A
B-A	94	24	344	0.274	94	0.3	0.4	15.907	C
C-AB	66	16	947	0.069	65	0.1	0.1	4.708	A
C-A	587	147			587				
A-B	65	16			65				
A-C	565	141			565				

00:45 - 01:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	34	8	471	0.072	34	0.1	0.1	8.564	A
B-A	94	24	344	0.274	94	0.4	0.4	15.987	C
C-AB	66	16	947	0.069	66	0.1	0.1	4.695	A
C-A	587	147			587				
A-B	65	16			65				
A-C	565	141			565				

01:00 - 01:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	28	7	507	0.055	28	0.1	0.1	7.808	A
B-A	77	19	395	0.195	78	0.4	0.3	12.632	B
C-AB	43	11	882	0.049	43	0.1	0.1	4.951	A
C-A	490	122			490				
A-B	53	13			53				
A-C	462	115			462				

01:15 - 01:30

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	23	6	532	0.044	23	0.1	0.0	7.357	A
B-A	65	16	431	0.150	65	0.3	0.2	10.926	B
C-AB	31	8	836	0.037	31	0.1	0.1	5.191	A
C-A	415	104			415				
A-B	45	11			45				
A-C	387	97			387				

2029+Comm, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Demand Set Relationship	D11 - 2029+Comm , AM	Demand Set relationships are chained. This may slow down the file.

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		1.07	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically	Relationship type	Relationship
D12	2029+Comm	PM	ONE HOUR	00:00	01:30	15	✓	Simple	D4+D6

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A - A595W		ONE HOUR	✓	530	100.000
B - B5301		ONE HOUR	✓	81	100.000
C - A595E		ONE HOUR	✓	485	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A - A595W	B - B5301	C - A595E
From	A - A595W	0	63	467
	B - B5301	72	0	10
	C - A595E	464	21	0

Proportions

		To		
		A - A595W	B - B5301	C - A595E
From	A - A595W	0.00	0.12	0.88
	B - B5301	0.88	0.00	0.12
	C - A595E	0.96	0.04	0.00

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A - A595W	B - B5301	C - A595E
From	A - A595W	0	8	39
	B - B5301	5	0	13
	C - A595E	4	6	0

Average PCU Per Veh

		To		
		A - A595W	B - B5301	C - A595E
From	A - A595W	1.000	1.080	1.385
	B - B5301	1.050	1.000	1.130
	C - A595E	1.039	1.060	1.000

Detailed Demand Data

Demand for each time segment

Time Segment	Arm	Demand (PCU/hr)	Demand in PCU (PCU/hr)
00:00-00:15	A - A595W	399	399
	B - B5301	61	61
	C - A595E	365	365
00:15-00:30	A - A595W	477	477
	B - B5301	73	73
	C - A595E	436	436
00:30-00:45	A - A595W	584	584
	B - B5301	90	90
	C - A595E	534	534
00:45-01:00	A - A595W	584	584
	B - B5301	90	90
	C - A595E	534	534
01:00-01:15	A - A595W	477	477
	B - B5301	73	73
	C - A595E	436	436
01:15-01:30	A - A595W	399	399
	B - B5301	61	61
	C - A595E	365	365

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-C	0.02	8.88	0.0	A	9	14
B-A	0.20	12.01	0.3	B	66	98
C-AB	0.06	5.00	0.1	A	41	62
C-A					404	606
A-B					58	86
A-C					429	643

Main Results for each time segment

00:00 - 00:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	7	2	518	0.014	7	0.0	0.0	7.959	A
B-A	54	13	473	0.114	53	0.0	0.1	9.000	A
C-AB	28	7	784	0.036	28	0.0	0.1	5.001	A
C-A	337	84			337				
A-B	47	12			47				
A-C	352	88			352				

00:15 - 00:30

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	9	2	498	0.018	9	0.0	0.0	8.315	A
B-A	64	16	439	0.146	64	0.1	0.2	10.066	B
C-AB	38	10	818	0.047	38	0.1	0.1	4.847	A
C-A	397	99			397				
A-B	56	14			56				
A-C	420	105			420				

00:30 - 00:45

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	11	3	469	0.023	11	0.0	0.0	8.878	A
B-A	79	20	393	0.200	78	0.2	0.3	11.986	B
C-AB	56	14	867	0.065	56	0.1	0.1	4.654	A
C-A	478	119			478				
A-B	69	17			69				
A-C	515	129			515				

00:45 - 01:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	11	3	469	0.023	11	0.0	0.0	8.881	A
B-A	79	20	393	0.200	79	0.3	0.3	12.010	B
C-AB	56	14	867	0.065	56	0.1	0.1	4.654	A
C-A	478	119			478				
A-B	69	17			69				
A-C	515	129			515				

01:00 - 01:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	9	2	498	0.018	9	0.0	0.0	8.321	A
B-A	64	16	439	0.146	65	0.3	0.2	10.091	B
C-AB	39	10	818	0.047	39	0.1	0.1	4.842	A
C-A	397	99			397				
A-B	56	14			56				
A-C	420	105			420				

01:15 - 01:30

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	7	2	518	0.014	7	0.0	0.0	7.965	A
B-A	54	13	473	0.114	54	0.2	0.1	9.032	A
C-AB	28	7	784	0.036	29	0.1	0.1	5.000	A
C-A	337	84			337				
A-B	47	12			47				
A-C	352	88			352				

2029+Comm+Dev, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Demand Set Relationship	D11 - 2029+Comm , AM	Demand Set relationships are chained. This may slow down the file.

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		1.73	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically	Relationship type	Relationship
D13	2029+Comm+Dev	AM	ONE HOUR	00:00	01:30	15	✓	Simple	D3+D5+D7

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A - A595W		ONE HOUR	✓	582	100.000
B - B5301		ONE HOUR	✓	127	100.000
C - A595E		ONE HOUR	✓	602	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A - A595W	B - B5301	C - A595E
From	A - A595W	0	68	514
	B - B5301	91	0	36
	C - A595E	573	29	0

Proportions

		To		
		A - A595W	B - B5301	C - A595E
From	A - A595W	0.00	0.12	0.88
	B - B5301	0.72	0.00	0.28
	C - A595E	0.95	0.05	0.00

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A - A595W	B - B5301	C - A595E
From	A - A595W	0	9	6
	B - B5301	13	0	6
	C - A595E	11	30	0

Average PCU Per Veh

		To		
		A - A595W	B - B5301	C - A595E
From	A - A595W	1.000	1.094	1.058
	B - B5301	1.126	1.000	1.060
	C - A595E	1.112	1.303	1.000

Detailed Demand Data

Demand for each time segment

Time Segment	Arm	Demand (PCU/hr)	Demand in PCU (PCU/hr)
00:00-00:15	A - A595W	438	438
	B - B5301	95	95
	C - A595E	453	453
00:15-00:30	A - A595W	523	523
	B - B5301	114	114
	C - A595E	541	541
00:30-00:45	A - A595W	641	641
	B - B5301	139	139
	C - A595E	663	663
00:45-01:00	A - A595W	641	641
	B - B5301	139	139
	C - A595E	663	663
01:00-01:15	A - A595W	523	523
	B - B5301	114	114
	C - A595E	541	541
01:15-01:30	A - A595W	438	438
	B - B5301	95	95
	C - A595E	453	453

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-C	0.08	8.87	0.1	A	33	49
B-A	0.30	17.07	0.5	C	83	125
C-AB	0.10	5.45	0.3	A	68	102
C-A					484	726
A-B					63	94
A-C					471	707

Main Results for each time segment

00:00 - 00:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	27	7	534	0.050	27	0.0	0.1	7.517	A
B-A	68	17	425	0.161	68	0.0	0.2	11.319	B
C-AB	45	11	835	0.054	44	0.0	0.1	5.451	A
C-A	408	102			408				
A-B	51	13			51				
A-C	387	97			387				

00:15 - 00:30

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	32	8	508	0.063	32	0.1	0.1	8.013	A
B-A	82	20	388	0.210	81	0.2	0.3	13.188	B
C-AB	63	16	880	0.071	63	0.1	0.1	5.241	A
C-A	478	120			478				
A-B	61	15			61				
A-C	462	115			462				

00:30 - 00:45

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	39	10	470	0.084	39	0.1	0.1	8.860	A
B-A	100	25	337	0.296	99	0.3	0.5	16.972	C
C-AB	96	24	945	0.101	95	0.1	0.3	4.980	A
C-A	567	142			567				
A-B	75	19			75				
A-C	565	141			565				

00:45 - 01:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	39	10	469	0.084	39	0.1	0.1	8.873	A
B-A	100	25	337	0.296	100	0.5	0.5	17.067	C
C-AB	96	24	946	0.102	96	0.3	0.3	4.958	A
C-A	567	142			567				
A-B	75	19			75				
A-C	565	141			565				

01:00 - 01:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	32	8	508	0.063	32	0.1	0.1	8.029	A
B-A	82	20	388	0.210	82	0.5	0.3	13.273	B
C-AB	63	16	880	0.071	63	0.3	0.2	5.178	A
C-A	478	120			478				
A-B	61	15			61				
A-C	462	115			462				

01:15 - 01:30

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	27	7	533	0.051	27	0.1	0.1	7.535	A
B-A	68	17	425	0.161	69	0.3	0.2	11.383	B
C-AB	45	11	835	0.054	45	0.2	0.1	5.421	A
C-A	408	102			408				
A-B	51	13			51				
A-C	387	97			387				

2029+Comm+Dev, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Demand Set Relationship	D11 - 2029+Comm , AM	Demand Set relationships are chained. This may slow down the file.

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		1.36	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically	Relationship type	Relationship
D14	2029+Comm+Dev	PM	ONE HOUR	00:00	01:30	15	✓	Simple	D4+D6+D8

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A - A595W		ONE HOUR	✓	535	100.000
B - B5301		ONE HOUR	✓	99	100.000
C - A595E		ONE HOUR	✓	490	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A - A595W	B - B5301	C - A595E
From	A - A595W	0	68	467
	B - B5301	81	0	19
	C - A595E	464	26	0

Proportions

		To		
		A - A595W	B - B5301	C - A595E
From	A - A595W	0.00	0.13	0.87
	B - B5301	0.81	0.00	0.19
	C - A595E	0.95	0.05	0.00

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A - A595W	B - B5301	C - A595E
From	A - A595W	0	9	39
	B - B5301	9	0	16
	C - A595E	4	12	0

Average PCU Per Veh

		To		
		A - A595W	B - B5301	C - A595E
From	A - A595W	1.000	1.088	1.385
	B - B5301	1.086	1.000	1.162
	C - A595E	1.039	1.124	1.000

Detailed Demand Data

Demand for each time segment

Time Segment	Arm	Demand (PCU/hr)	Demand in PCU (PCU/hr)
00:00-00:15	A - A595W	403	403
	B - B5301	75	75
	C - A595E	369	369
00:15-00:30	A - A595W	481	481
	B - B5301	89	89
	C - A595E	440	440
00:30-00:45	A - A595W	589	589
	B - B5301	109	109
	C - A595E	539	539
00:45-01:00	A - A595W	589	589
	B - B5301	109	109
	C - A595E	539	539
01:00-01:15	A - A595W	481	481
	B - B5301	89	89
	C - A595E	440	440
01:15-01:30	A - A595W	403	403
	B - B5301	75	75
	C - A595E	369	369

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-C	0.04	9.20	0.1	A	17	26
B-A	0.23	13.29	0.3	B	74	111
C-AB	0.08	5.21	0.2	A	51	76
C-A					399	598
A-B					62	93
A-C					429	643

Main Results for each time segment

00:00 - 00:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	14	4	529	0.027	14	0.0	0.0	8.130	A
B-A	61	15	462	0.131	60	0.0	0.2	9.722	A
C-AB	35	9	784	0.045	35	0.0	0.1	5.213	A
C-A	334	83			334				
A-B	51	13			51				
A-C	352	88			352				

00:15 - 00:30

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	17	4	507	0.034	17	0.0	0.0	8.539	A
B-A	72	18	429	0.169	72	0.2	0.2	10.967	B
C-AB	48	12	817	0.058	48	0.1	0.1	5.059	A
C-A	393	98			393				
A-B	61	15			61				
A-C	420	105			420				

00:30 - 00:45

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	21	5	476	0.044	21	0.0	0.1	9.198	A
B-A	89	22	383	0.231	88	0.2	0.3	13.253	B
C-AB	70	17	866	0.081	70	0.1	0.2	4.859	A
C-A	470	117			470				
A-B	75	19			75				
A-C	515	129			515				

00:45 - 01:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	21	5	475	0.044	21	0.1	0.1	9.205	A
B-A	89	22	383	0.231	89	0.3	0.3	13.290	B
C-AB	70	17	866	0.081	70	0.2	0.2	4.849	A
C-A	469	117			469				
A-B	75	19			75				
A-C	515	129			515				

01:00 - 01:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	17	4	507	0.034	17	0.1	0.0	8.547	A
B-A	72	18	429	0.169	73	0.3	0.2	11.005	B
C-AB	48	12	817	0.059	48	0.2	0.1	5.030	A
C-A	393	98			393				
A-B	61	15			61				
A-C	420	105			420				

01:15 - 01:30

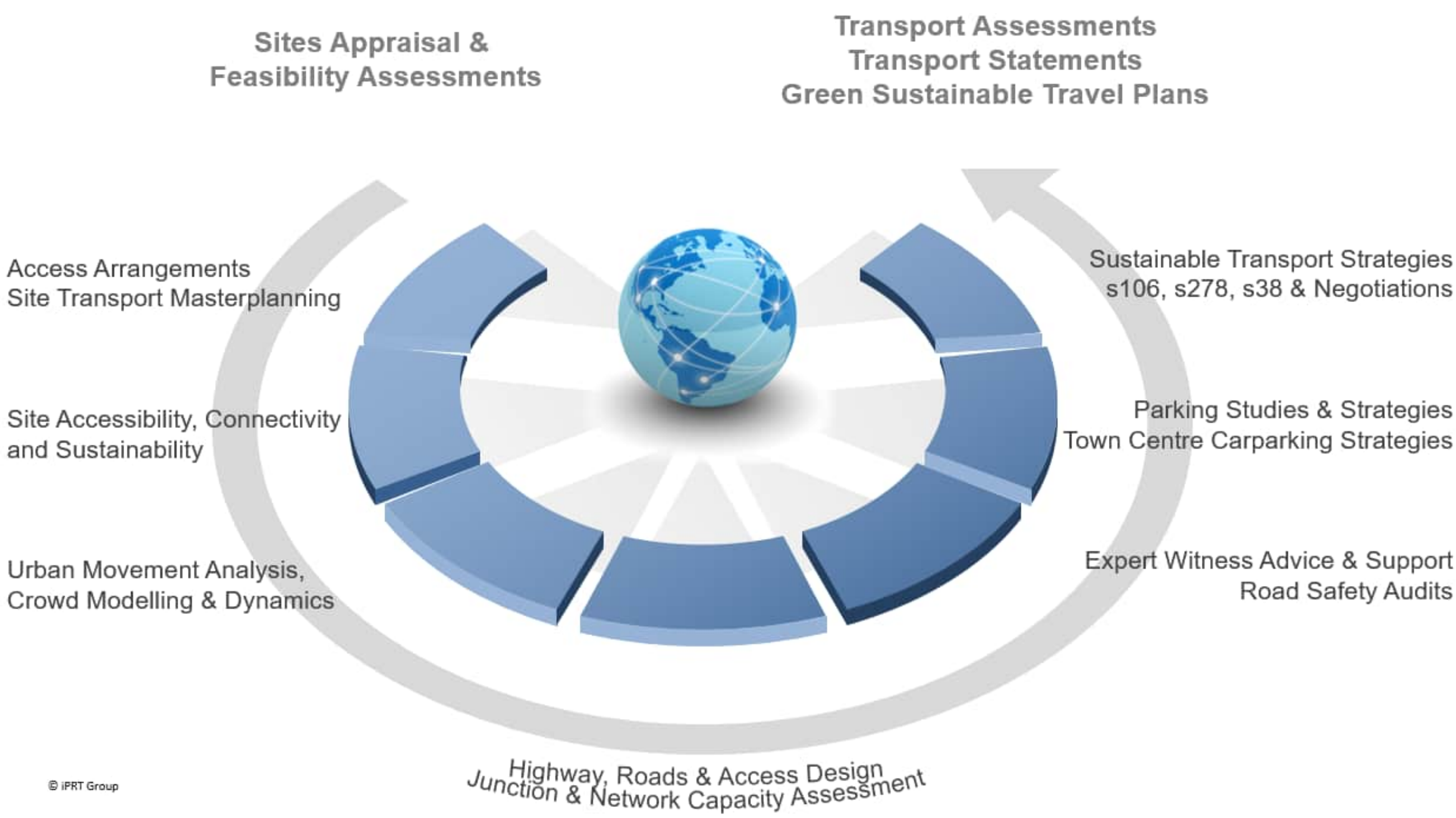
Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	14	4	528	0.027	14	0.0	0.0	8.141	A
B-A	61	15	462	0.131	61	0.2	0.2	9.765	A
C-AB	35	9	784	0.045	35	0.1	0.1	5.203	A
C-A	333	83			333				
A-B	51	13			51				
A-C	352	88			352				

itransport PLANNING

Creative Minds, *Intelligent Thinking*

Registered Office
Lugano Building, 57 Melbourne Street, Newcastle upon Tyne, NE1 2JQ
DDI: 0845 47 48 851 Cell: 07886 225 813 Fax: 0871 900 7432

Offices in…
Newcastle Upon Tyne | London | Leeds | Manchester | Birmingham | Edinburgh



Member of iPRT Group of Companies

APPENDIX 9:
GEOTECHNICAL ASSESSMENT OF THE QUARRY DESIGN

KEVAN WALTON ASSOCIATES Ltd

Geotechnical, Mining and Quarrying Consultants

Walnut Bank Lodge, Stodday, Lancaster, Lancs., LA2 OAG

T[redacted]

13th April 2021

HIGH CLOSE QUARRY

REVIEW
of
SLOPE STABILITY AND BLASTING ADJACENT TO THE FORMER LANDFILL

1 Background

The stability of the proposed quarry at High Close was reviewed by Kevan Walton, an Associate of TerraConsult in 2017 as part of the planning process for development of the quarry. A further report was issued by Kevan Walton Associates dated 4th April 2020 entitled *High Close Quarry Proposal, Slope Stability and Blasting Adjacent to the Former Landfill*, which considered the effect of blasting on the stability of the slope between the quarry and the adjacent historic landfill. These reports are summarised below and should be read in conjunction with this report.

Both of the previous reports considered a stand-off of 15m between the top of the quarry and the top of the landfill, corresponding to the distance from the quarry top to the landfill planning boundary. Since then, historic survey data of the landfill has been obtained to better define the limits of the landfill and this has been used to form the current report.

This and the previous reports address the stability of the slopes only and the possible effect of blasting on such stability including disturbance to the rock mass. The reports do not address directly the possible movement of leachate from the historical landfill nor the vibration caused by quarry blasting as these are dealt with by others.

1.1 <u>2017 Report (TerraConsult)</u>

The 2017 report reviewed the overall quarry design taking into account stability issues and the requirements of the Quarries Regulations 1999. The review was based on experience with quarrying operations in similar geological environments. (When excavation commences additional Geotechnical Assessment will be required to verify the assumptions made).

The quarry will be excavated in limestone. Bedding is recorded dipping gently to the north west at up to 8°. The overall geometry considered was of 12m high faces inclined at 80° with safety benches of 5m width. Maximum overall height will be up to 46m with overall angle at this height of approximately 64°.

The ramp gradient at 10% and 12m wide is satisfactory.

Overburden and interburden will be stored in dumps and mounds with maximum slope of 1v:3h (18.5°) and these should be stable for the anticipated materials.

Slope stability analyses were undertaken on the eastern quarry face using the Rocscience SLIDE limit equilibrium computer programme. The modelling incorporated the historical landfill site to the east to assess if the quarrying operations would have any effect on the stability of the landfill.

Anisotropic strength parameters were used, relatively weak in the direction of the bedding and very high strength in other directions to simulate potential slip planes along bedding. The parameters used in the analysis are as follows:

Material	**Cohesion (kN/m^2)**	**Friction Angle (°)**	**Density (kg/m^3)**
Limestone Bedding (1°to 8° to horizontal)	0	30	2600
Landfill	5	25	1300

The results of the analyses indicated that the Factor of Safety for slip planes through the limestone bedding and the landfill will be 2.81.

1.2 2020 Report (Kevan Walton Associates Ltd.)

Subsequently, concern was raised as to the effect of blasting on the stability of the quarry slopes and therefore in 2020 seismic analysis of the slope was undertaken based on the previous quarry profile. The SLIDE slope stability programme has the facility to apply a seismic (earthquake) loading to the model and although they are not strictly the same, a seismic load of 0.1g was applied to assess the likely effect of blasting. This reduced the Factor of Safety from 2.81 to 1.95. This is still well within the acceptable Factor of Safety and is unlikely to cause any permanent movement of the rock along the bedding planes and hence damage to the adjacent landfill.

A literature search on the disturbance of intact rock from blasting operations concluded that disturbance of the rock to any significant depth was unlikely. Furthermore, good blasting practice was extolled to reduce any such effect and that implementation of smooth or pre-split blasting can further reduce any potential damage.

2 2021 Review

Further information has been obtained showing the boundary of the old quarry containing the landfill in detail and this has been presented as Stephenson Halliday drawings as follows and attached:

Figure 1 – Former Landfill Site Separation Distance from the Proposed Quarry
Figure 2 - Former Landfill Site Section A
Figure 3 - Former Landfill Site Section B

2.1 Analyses

Section B has been copied into the Rocscience SLIDE computer programme for Limit Equilibrium stability analyses.

Using this information extends the stand-off between the top of the quarry and the top of the landfill from 15m to approximately 38m.

The model used incorporates an Anisotropic Function as before, so that slip surface searches take into account the lower shear strength along bedding planes. Strength parameters are the same as used in the previous analyses and tabulated in Par 1.1 above.

Water level 5m below the surface of the landfill has been used with a simple drawdown from the edge of the landfill to the toe of the quarry slope. This water level in the landfill was confirmed by recently drilled boreholes.

Although blasting vibration and earthquake vibration are different (as outlined in our report of April 2020), a seismic co-efficient of 0.1g was also introduced to simulate the effect of blasting on the stability.

The rigorous Morgenstern-Price method of analysis was used.

3 Results of Analyses

The results of the analyses are summarised as follows and presented in Figures 4 and 5 below.

Loading	Factor of Safety
Static	3.05
Seismic	2.01

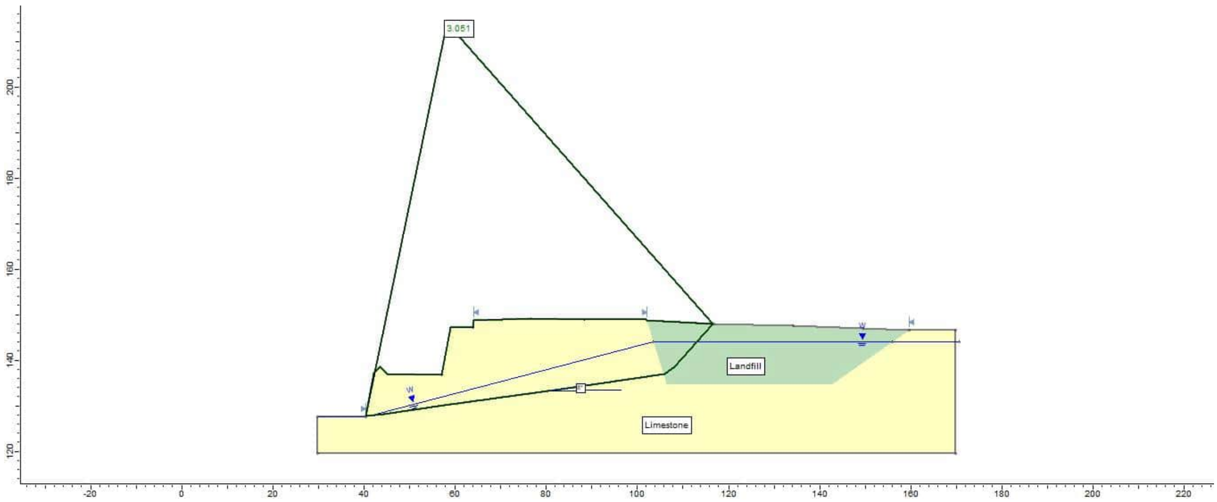


Figure 4 – Static Loading. Factor of Safety = 3.05

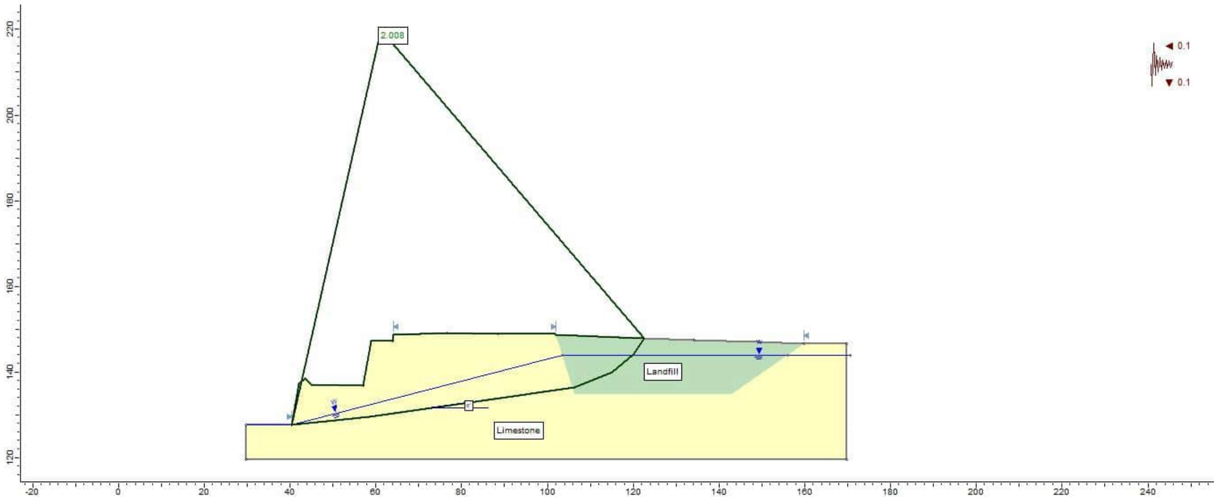


Figure 5 – Seismic Loading. Factor of Safety = 2.01

Although the Factors of Safety usually applied to operational quarry slopes are 1.2 or 1.3, where additional precautions are required then a Factor of Safety of 1.5 or 2.0 may be applied. For seismic loading a Factor of Safety of 1.0 or 1.1 is deemed adequate. Factors of Safety as analysed are therefore satisfactory.

4 Conclusions

4.1 Applying survey data of the old landfill to the east of the quarry extends the stand-off between the crest of the quarry face and the top of the landfill from the 15m previously analysed to about 38m. This increases the factor of Safety from 2.81 to 3.05, an increase of 0.14 or 5% for the static case.

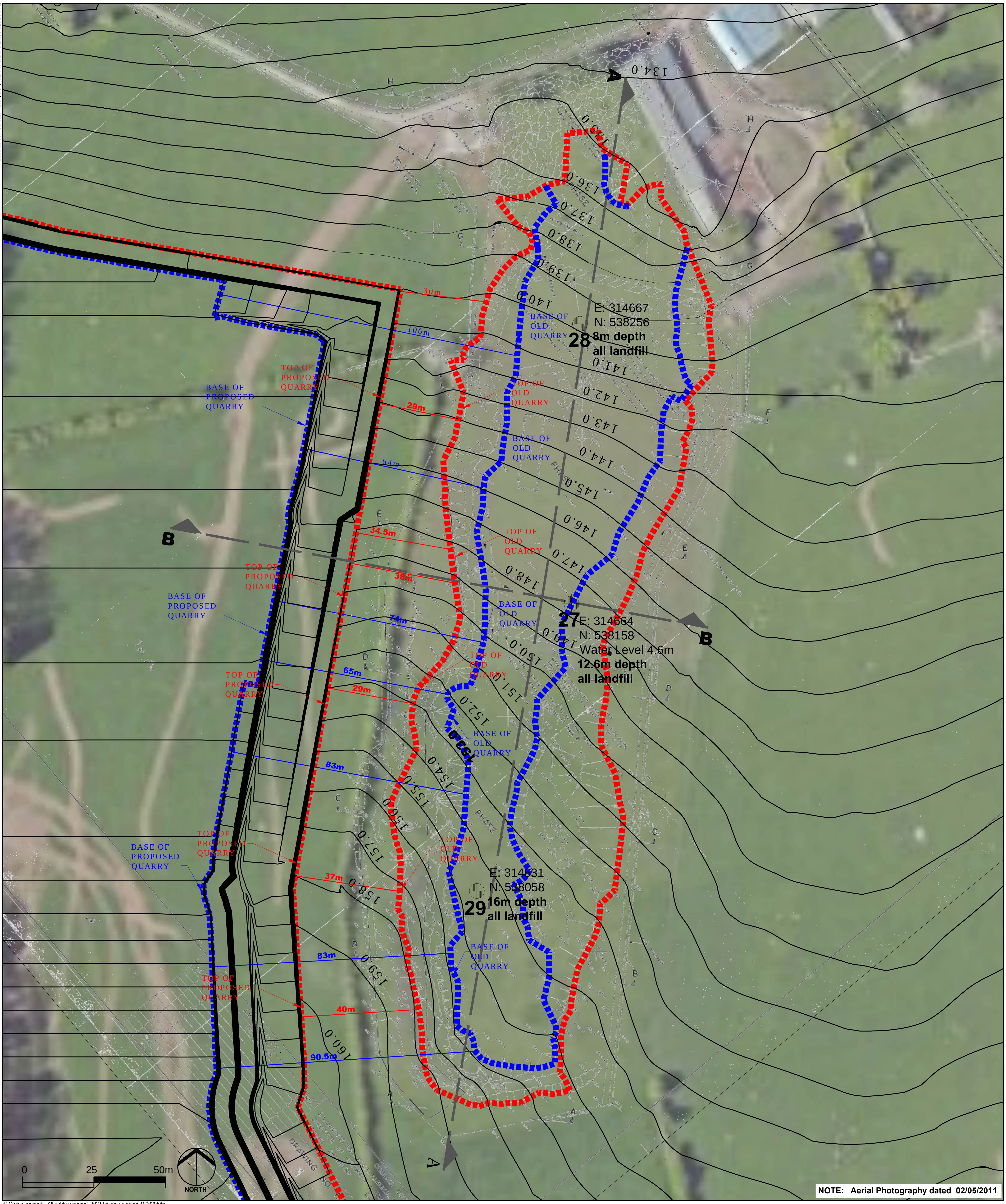
4.2 The corresponding change for the seismic analysis is to increase the Factor of Safety from 1.95 to 2.01, an increase of 0.06 or 3%. Blasting is therefore unlikely to cause instability of the slope between the quarry and the landfill.

4.3 Factors of Safety as analysed are satisfactory.

4.4 Although blast damage to intact rock can occur it is highly unlikely to penetrate to a significant depth. Damage due to blasting can be mitigated by good blasting practice and specialised blasting techniques.

[redacted]

K. S. Walton
B.Sc., M.Sc., C.Eng., C.Geol., M.I.M.M.M., F.G.S., F.I.Q., C.M.I.O.S.H.
Director
13th April 2020



KEY

- Former quarry / landfill site and proposed quarry top and base boundaries
- 2011 site survey, proposed full extraction and 5m OS terrain data at 1m contour intervals
- 1977 former quarry plan at full extraction prior to waste disposal landfill operations
- 37m — Top of old quarry to top of proposed quarry distance
- 83m — Base of old quarry to base of proposed quarry distance
- Landfill site boreholes
- Sections A & B

STEPHENSON HALLIDAY
Planning, Landscape & Environment

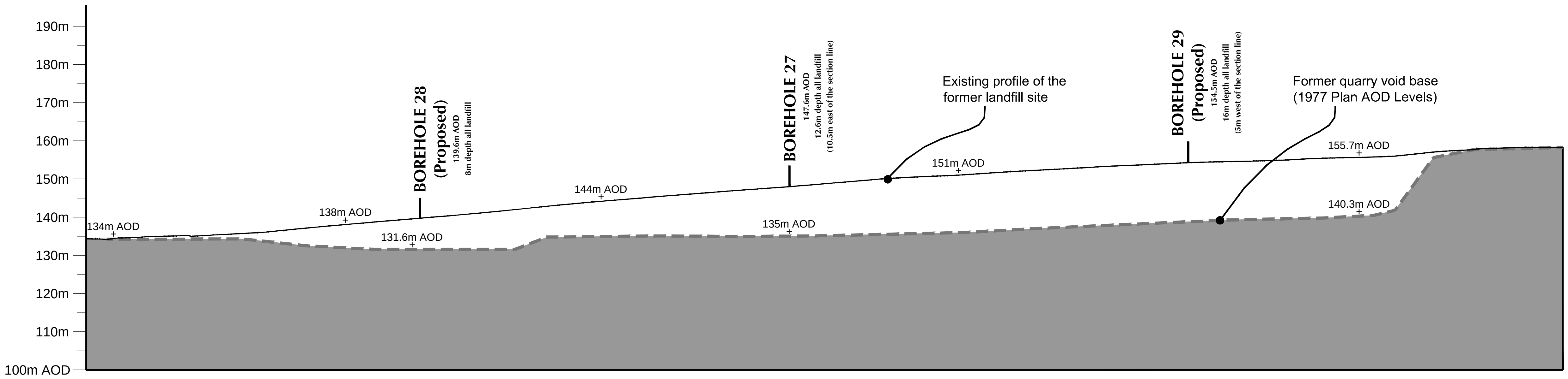
HIGH CLOSE QUARRY

FIGURE 1

Former Landfill Site Separation Distance from the Proposed Quarry

DATE	BY	PAPER	SCALE	QA	REV
FEB 2021	DF	A3	1:1,250	PS	B

2021-02-08 HCL-022Kt Old Quarry_Landfill Site Distances Update.dwg



SECTION A - A

KEY

Existing Landfill site profile

Former quarry 1977 void base

HIGH CLOSE QUARRY

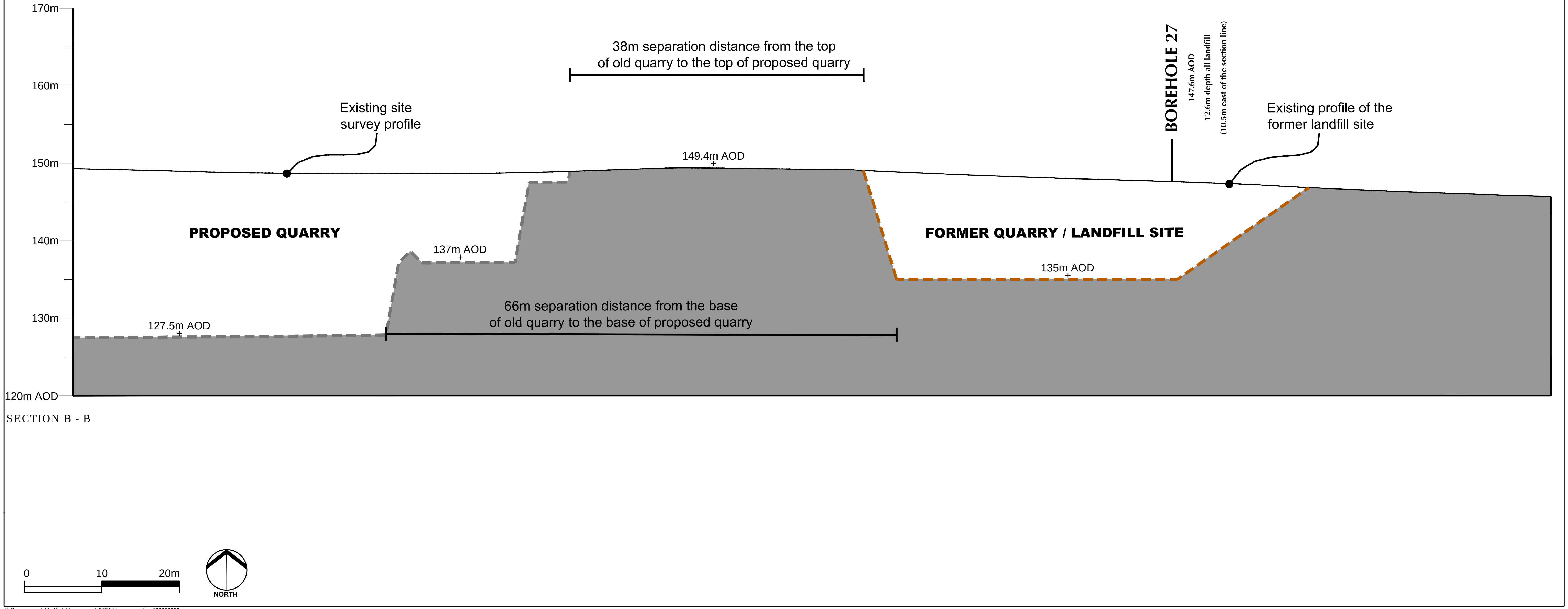
FIGURE 2

Former Landfill Site: Section A

STEPHENSON HALLIDAY
Planning, Landscape & Environment

DATE	BY	PAPER	SCALE	QA	REV
JAN 2021	DF	A3	1:1,250	PS	A

2021-02-08 HCL-022Kf Old Quarry_Landfill Site Distances Update.dwg



KEY

- Existing site survey and landfill site profile
- Former quarry 1977 void base
- Proposed quarry void base

STEPHENSON HALLIDAY
Planning, Landscape & Environment

HIGH CLOSE QUARRY

FIGURE 3

Former Landfill Site: Section B

DATE	BY	PAPER	SCALE	QA	REV
FEB 2021	DF	A3	1:500	PS	-

APPENDIX 10:
HYDROGEOLOGY AND HYDROLOGY

RICK BRASSINGTON
Consultant Hydrogeologist

Hydrogeological Impact Assessment for an application for the determination of conditions in respect of the dormant planning permission reference CA49 at High Close Quarry, Plumbland, Cumbria

For Stephenson Halliday Ltd

Rick Brassington
Consultant Hydrogeologist
12 Culcheth Hall Drive
Culcheth
Warrington
Cheshire
WA3 4PS

August 2022

Eur Geol Eur Ing F.C. Brassington BSc MSc CGeol FGS CEng MICE FCIWEM

Contents

1. Introduction

1.1 There is a dormant mineral planning permission (reference CA 49) relating to High Close Quarry, and the proposed application concerns the determination of the conditions under the Environment Act 1995 to which this dormant mineral planning permission will be subject when reactivated. In essence, there is a permission in principle to quarry limestone although this cannot be implemented until an application for new planning conditions (which includes a modern working and restoration scheme) has been submitted and approved by the Mineral Planning Authority. It has been agreed with the Mineral Planning Authority that the application should be subject to an Environmental Impact Assessment and the production of an Environmental Statement (ES).

1.2 The responses to the proposal have required a more detailed assessment of the hydrogeology of the site particularly in respect of the groundwater chemistry and the influence of the proposal on the local groundwater resources. In February 2020 Stephenson Halliday engaged Dr Craig Fannin of TerraConsult (now Byrne Looby), an acknowledged expert on landfill chemistry and the impact on the local groundwater systems to further assess and to express his opinion on the site. Dr Fannin's latest report of July 2022, (High Close Quarry Development Landfill Quarry Hydrogeological Relationship) has been used to update this report.

1.3 The proposal is to quarry to a depth that is generally above the water table although it will be necessary to make provisions to deal with any water that flows from the ground when the water table is at its highest. A pre-existing quarry lies in the centre of the permission site and was used as an unlined 'dilute and disperse' landfill by Cumbria County Council that was closed in 1990. It is understood that surface water monitoring and gas monitoring has taken place although the results have not been seen and as far as is known no groundwater monitoring took place.

1.4 Instruction was first received in November 2016 to review the available data and provide advice on the location of monitoring boreholes to be drilled around the site perimeter.

1.5 Six groundwater level monitoring boreholes were drilled following the initial hydrogeological assessment report with a further one being drilled in the centre of the former landfill. Groundwater monitoring commenced in January 2017 and an additional report was prepared in January 2018. Following Scoping Report consultation responses received from the Environment Agency on the 11th May 2018 and the 3rd August 2018, a revised hydrogeological assessment was submitted with the Environmental Statement in August 2019.

1.6 In June 2020 Cumbria County Council issued a Schedule of Further Information Requirements under Regulation 22. In relation to hydrogeology and the landfill site a significant amount of information was requested primarily to address comments raised by the Environment Agency and the EHO of Allerdale Borough Council.

1.7 This report addresses all the Regulation 22 further information requirements relating to hydrogeology, particularly the queries in the Environment Agency consultation letter response of October 2019 which recommended that planning permission is refused because “there is insufficient information to demonstrate that the risk of pollution to controlled waters is acceptable”.

1.8 Further responses from the EA were received (27th May 2020, 18th August 2020, 16th September 2020, 22nd December 2020 and the 21st January) all of which have been taken into account in this report where appropriate. In addition, following an EA request, a further two boreholes were drilled in January 2021 into the waste material on the former landfill site. As a result, this report combines the information contained in earlier reports, addresses the Regulation 22 information, the EA comments and more recent sampling, and is the final one.

1.9 Copies of the correspondence from the Environment Agency are attached as an appendix to this report for completeness. This correspondence comprises seven letters and one email.

1.10 To address specific specialist comments relating to the former landfill and chemistry raised by the EA of October 2019, TerraConsult Ltd was engaged by the applicant in February 2020 to report on the landfill and the leachate chemistry (TerraConsult 2020) which was submitted to the Environment Agency.

1.11 Following further EA comments, Byrne Looby has updated its April 2020 report and incorporated data from the two additional borehole piezometer installations (February 2021) on the former landfill site as well as from a continuation of the holistic monitoring programme to this point in time.

1.12 The latest report (Byrne Looby 2022) presents the results of a continued monitoring programme in the context of the proposed quarry’s hydrogeological relationship to the closed landfill. It is intended to act as a technical addendum to this hydrogeology assessment.

1.13 Groundwater levels have been measured from December 2017 to date and this data set has been used as the basis to assess the depth to which quarrying can take place and evaluate the groundwater flow system downstream of the quarry site.

1.14 This geology of the site has been described in detail in reports by Stephenson Halliday and the discussions in this report are in sufficient detail to enable the hydrogeology to be assessed and are based largely on published British Geological Survey (BGS) maps and reports.

Information Used in this Report

1.15 Information from the following sources has been used to prepare this report:

Reports and drawings

Cumbria County Council 1977 High Close Quarry Working Plan

Cumbria Waste Ltd – Reports of analyses of samples taken

Rick Brassington - Hydrogeological Impact Assessment for an application for the determination of conditions in respect of the dormant planning permission reference CA49 at High Close Quarry, Plumbland, Cumbria. Various reports from 2017 to 2022

Stephenson Halliday – Preliminary report on geological investigation carried out on the area with dormant planning permission at High Close. Draft consultancy report April 2011

Stephenson Halliday Ltd – Conceptual working scheme options 1. (Plan). September 2016

Stephenson Halliday Ltd – Conceptual working scheme options 1 – 4. (Cross sections) September 2016

TerraConsult Ltd 2020 High Close Quarry Landfill Hydrogeological Relationships. Report No 2934-R01 prepared for Stephenson Halliday Ltd.

TerraConsult Ltd 2021 High Close Quarry Development Landfill Quarry Hydrogeological Relationship. Report No 2934-R02 prepared for Stephenson Halliday Ltd.

TerraConsult Ltd 2022. Close Quarry Development Landfill Quarry Hydrogeological Relationship. Report No 2934-R03 prepared for Stephenson Halliday Ltd.

Published documents

Allen, D.J., Brewerton, L.J., Coleby, L.M., Gibbs, B.R., Lewis, M.A., MacDonald, A.M, Wagstaff, S.J. & Williams A.T. 1997. ***The physical properties of major aquifers in England and Wales***. British Geological Survey Technical report WD/97/34. Environment Agency R&D Publication 8.

Eastwood, T., Hollingworth, S.E., Rose, W.C.C. & Trotter, F.M. 1968. ***Geology of the country around Cockermouth and Caldbeck Explanation of One-inch Geological Sheet 23 New Series***. British Geological Survey, Keyworth, Nottingham

Hem, J.D. 1985. Study and Interpretation of the Chemical Characteristics of Natural Waters (Third Edition). ***US Geological Survey Water Supply Paper 2254.***

Piper, A.M. 1944, A graphic procedure in the geochemical interpretation of water analyses. ***Transactions of the American Geophysical Union***, **25**, 914-928

Schoeller, H. 1962, ***Les Euax Souterraines***, Masson & Cie, Paris 642 pp

Young, B. & Armstrong M. 1989. ***The applied geological mapping of the Dearham and Gilcrux area, Cumbria. Technical Report*** WA/89/70 British Geological Survey, Keyworth, Nottingham

BGS maps

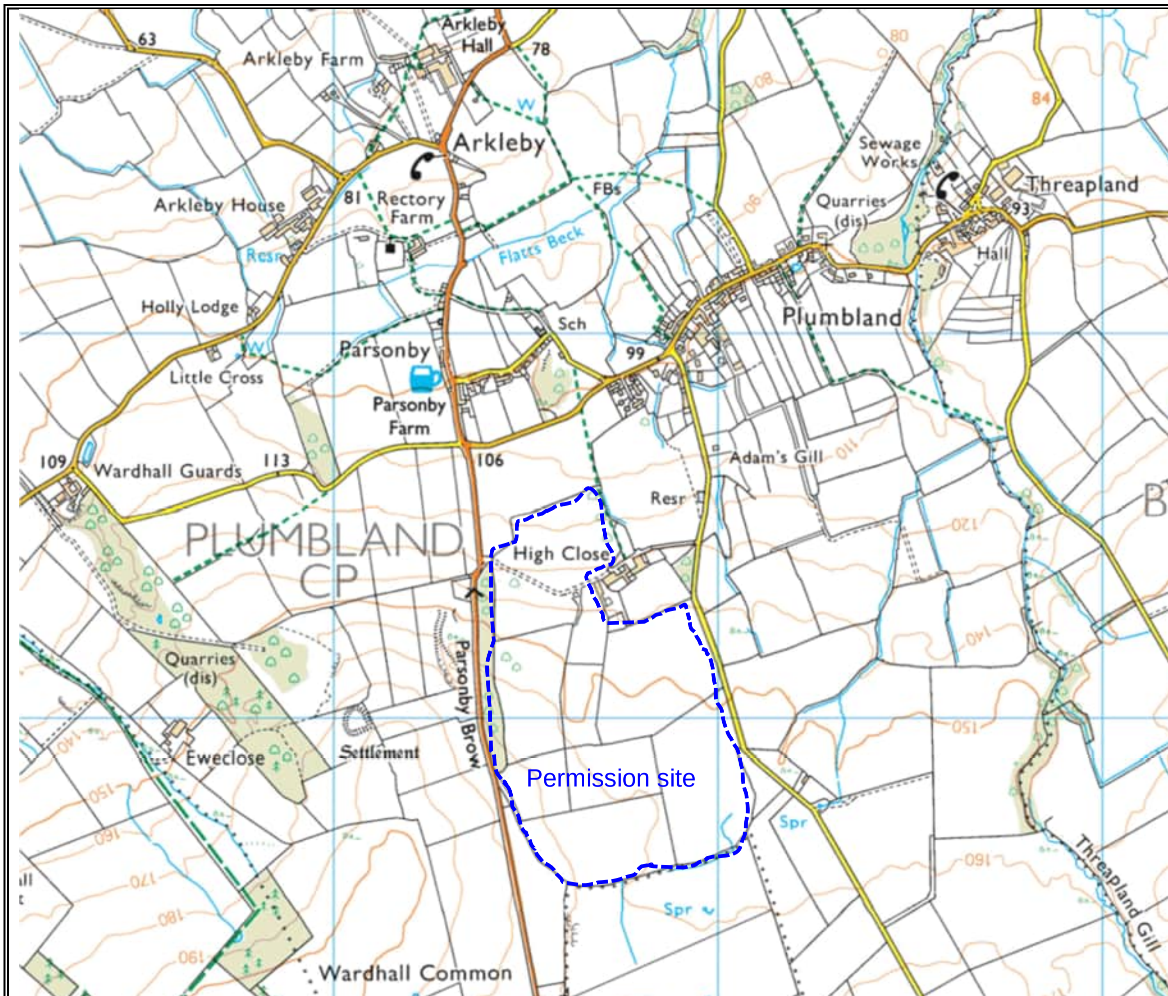
Cockermouth Sheet 23 Solid edition 1997
Cockermouth Sheet 23 Solid and Drift edition 1997

1.16 Extracts from Ordnance Survey maps have been made by permission under Copyright Licence No. AL 52636A0001. Extracts from geological maps have been reproduced under Copyright Licence IPR/73-55C by permission of the Director, British Geological Survey.

2. Topographical setting

2.1 The site is located some 780 m to the southwest of the village of Plumbland, Cumbria and 800 m due south of Parsonby. It is located on a north-facing hillside, part of the valley of the River Ellen with a range in elevation from 168 mOD in the south to 130 mOD at the northern end.

2.2 A local spring lies at an elevation of some 108 mOD and is part of the Flatts Beck headwaters, a tributary of the River Ellen. The Ordnance Survey map also shows springs at higher elevations that are thrown out from fractures in the underlying limestone. Some of these springs give rise to small watercourses in the headwaters of Flatts Beck and others flow into Threapland Gill another tributary of the River Ellen that lies to the east.



RICK BRASSINGTON *Consultant Hydrogeologist* Hydrogeological assessment of High Close Quarry, Plumbland For Stephenson Halliday Ltd *Ref: 1819/August 2022*	Figure 2.1 – Location plan Scale: one kilometre between grid lines Reproduced from ©Ordnance Survey maps under Copyright Licence No AL 52636A0001

3. Geology

3.1 The geology of the area is defined by the BGS Cockermouth Maps 23 Solid and Drift) with the accompanying memoir. The description is provided here as the framework for the hydrogeological interpretation.

3.2 The geological sequence is largely Carboniferous Limestone that is separated by relatively thin beds of sandstone, siltstone, and mudstone. The geological sequence at the permission area is shown in Table 3.1 which also includes the approximate thicknesses of the various beds. The majority of the site is underlain by the Fifth Limestone with a small amount of the area underlain by the Fourth and Sixth Limestones. These limestones are part of the Eskett Limestone Formation which is part of the Great Scar Limestone Group. The quarry excavation is planned to be into the Fifth Limestone although the planning area extends to the Fourth and Sixth Limestones.

Group	Formation	Member	Notes	Thickness (m)
Great Scar Limestone Group	Eskett Limestone Formation	Fourth Limestone	limestone with thin beds of sandstone and mudstone	130
		Fifth Limestone	mainly limestone with sandstone & mudstone at its base	58
		Sixth Limestone	mainly limestone with sandstone & mudstone at its base	38

NOTE: Thicknesses given are average values for the area.

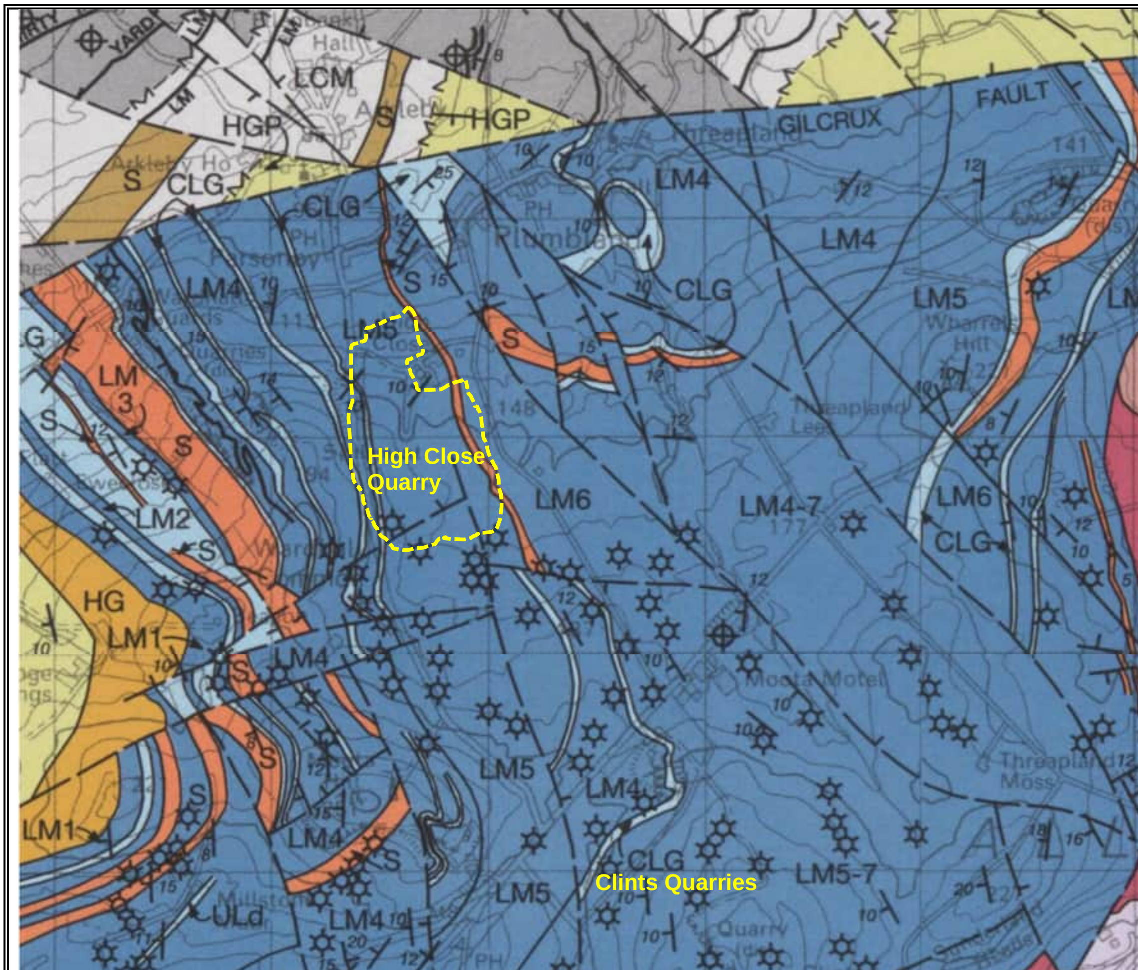
Table 3.1 – Geological sequence at the High Close Quarry site

3.3 The limestones are generally thickly bedded and dark to pale grey in colour. Locally they contain shaly layers and thin bands of chert. There are also beds of sandstone that are generally less than 1 m in thickness although locally are up to some 10 m in thickness. The beds dip to the west/northwest at 10^{o} in the vicinity of the site.

3.4 The variation in the geology across the local area are shown below in Figures 3.1 and 3.2 that are reproduced from BGS mapping with the key shown in Figure 3.3.

3.5 The area is faulted with the closest one lying at the southern end of the site. Further faulting lies some 250 m to the northeast of the site and trends to the northwest and downthrown to the northeast. These faults may have some influence on groundwater movements although there is insufficient information on this aspect to be certain. The major Gilcrux Fault lies about a kilometre to the north and trends to the east. It forms the southern boundary to the eastern end of the Cumberland Coal Field and is of significance to the local groundwater flow system. There are also a number of swallow holes marked on the map with three occurring at the southern end of the original quarry area

3.6 The drift at the site is boulder clay (or till) and varies in thickness from less than one metre to some 7 m in the proposed area of excavation, increasing towards the eastern edge of the site. The southwestern area of the site is shown as drift free on the BGS map. River alluvium is found along the lower parts of stream valleys. The drift is shown on Figure 3.2.



RICK BRASSINGTON
Consultant Hydrogeologist

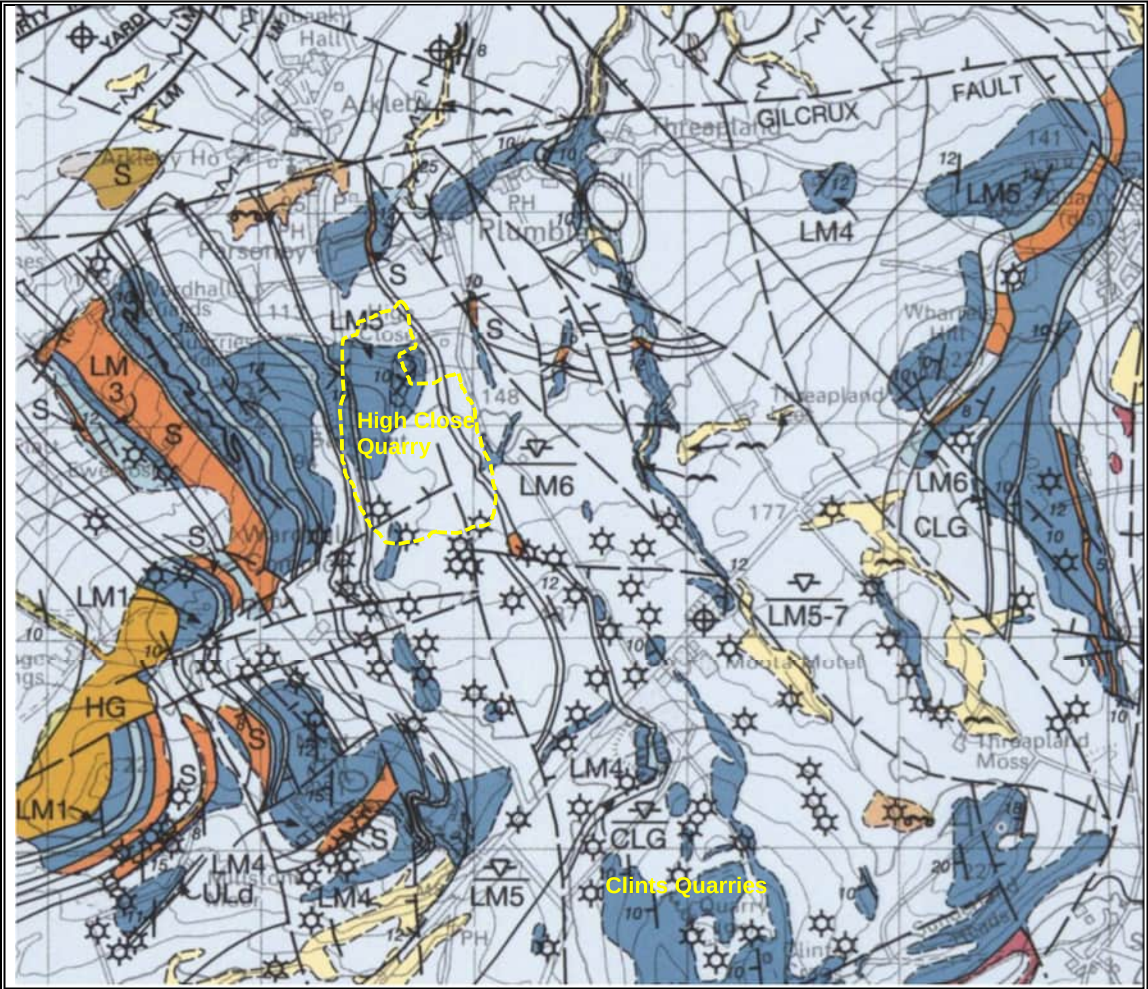
Hydrogeological assessment of
High Close Quarry, Plumbland

For Stephenson Halliday Ltd

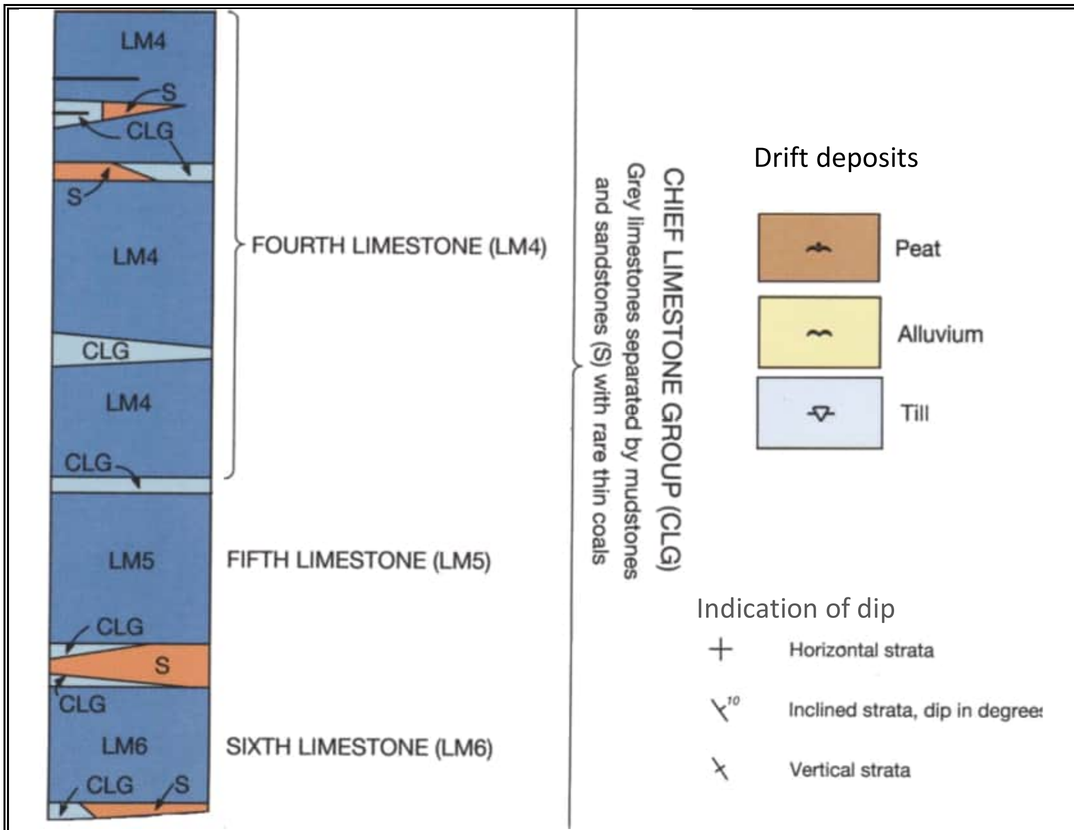
Ref: 1819/August 2022

Figure 3.1 - Solid geology map

Scale: one kilometre between grid lines



<u>RICK BRASSINGTON</u> *Consultant Hydrogeologist* Hydrogeological assessment of High Close Quarry, Plumbland For Stephenson Halliday Ltd *Ref: 1819/August 2022*	Figure 3.2 – Drift geology map Scale: one kilometre between grid lines British Geological Survey. ©NERC All Rights Reserved Copyright Licence No C05/06-CSL Reproduced from ©Ordnance Survey maps under Copyright Licence No AL 52636A0001



RICK BRASSINGTON *Consultant Hydrogeologist* Hydrogeological assessment of High Close Quarry, Plumbland For Stephenson Halliday Ltd *Ref: 1819/August 2022*	Figure 3.3 – Key to geological map

4. Hydrogeology

4.1 The limestone has an extremely low intergranular permeability with a porosity that is less than 2% (Allen ***et al***, 1997). Consequently, almost all the groundwater is held in cracks and fissures or fractures that have resulted from earth movements. As limestone is soluble, it dissolves in the circulating groundwater in a process known as karstification. The largest fracture systems contain the largest groundwater flow and, as a result, the dissolution process increases the size of the largest fractures by the greatest amount and as a result, these fractures contain almost all the local groundwater.

Groundwater elevations

4.2 Figure 4.1 shows the location of the six monitoring boreholes drilled across the site in January 2017, with the three drilled in the centre of the former landfill together with the approximate outline of the old landfill. The two springs, Flatts Beck Spring and Farm Spring that have been included in the sampling system are also shown.

4.3 Table 4.1 shows the groundwater level data for the monitoring boreholes with the data shown in mOD. The landfill boreholes show little change in levels reflecting that the landfill is draining through its base and sides although there is a gradient from south to north along the landfill indicating flow through the waste materials. The landfill was operated from the 1970s to 1990 using the dilute and disperse principal prevalent at the time which relies on the leachate flowing into the groundwater system where it is both diluted and natural processes destroy it over a period of time.

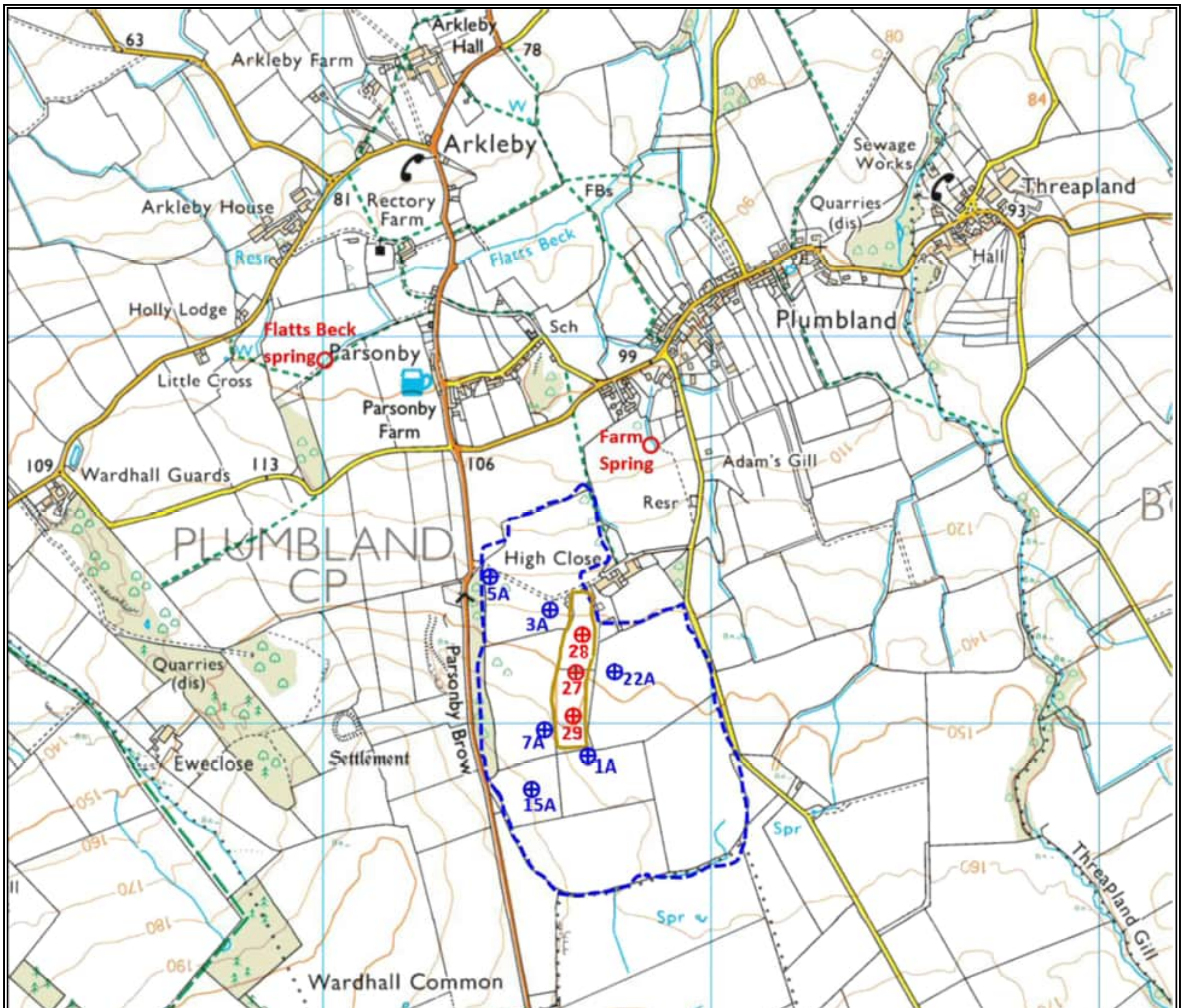
4.4 Figure 4.2 shows the groundwater hydrographs for the monitoring boreholes with measurements taken from January 2017 to May 2022. The groundwater levels all generally followed the same pattern with a few readings missing. Groundwater elevations are generally below the proposed quarry floor.

4.5 The groundwater levels measured across the site are all significantly below the elevation of the leachate level measured in the landfill borehole. It may be concluded from this observation that leachate from the old landfill is draining vertically down through the base and the sides into the limestone beneath the site to reach the water table at some depth below the landfill base. The near-constant groundwater levels in the landfill boreholes suggest that the landfilled materials have a low permeability and only drains very slowly. This conclusion is supported by the observations on the chemical data (see below).

4.6 The leachate elevations in the three boreholes drilled on the landfill show that the leachate has the potential to flow to the north.

4.7 Figure 4.3 shows the logs for all the boreholes drilled on the site with the recent ones marked in red and the borehole number suffixed by an ‘A’.

4.8 The left-hand map in Figure 4.4 shows the highest recorded groundwater elevations for individual boreholes that occurred in February 2021 with the right-hand map showing the low elevations in the following July. It can be seen from these values that the groundwater elevations show two general flow directions, the first towards just west of north in the direction of the Flatts Beck Spring and the second to the Farm Spring north of the site.



RICK BRASSINGTON
Consultant Hydrogeologist

Hydrogeological assessment of
High Close Quarry, Plumbland

For Stephenson Halliday Ltd

Ref: 1819/August 2022

Figure 4.1 – Location of monitoring points

Scale: one kilometre between grid lines

Key

⊕ borehole landfill

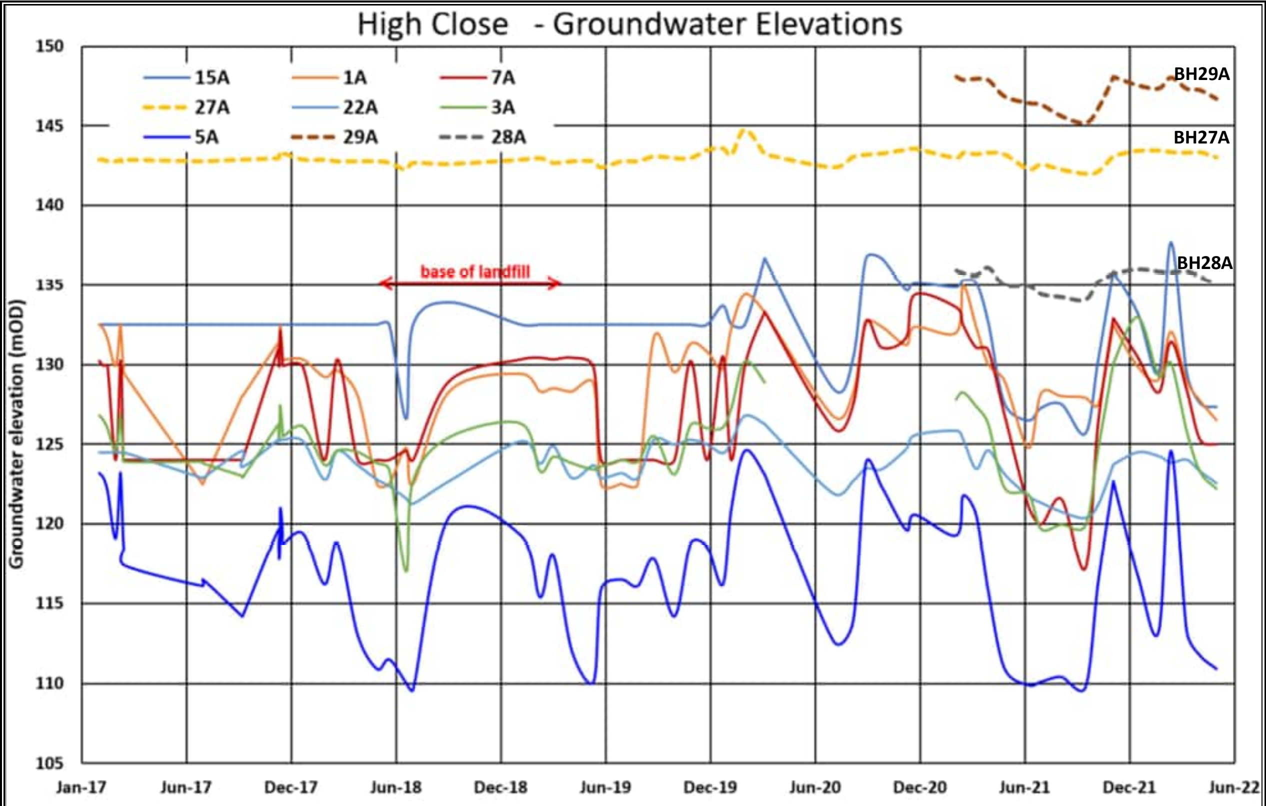
	15A	1A	7A	Tip (27)	22A	3A	5A	29	28
31-Jan-17	132.50	132.50	130.20	142.90	124.50	126.80	123.20		
7-Feb-17	132.50	132.20	129.90	142.90	124.50	126.50	122.90		
14-Feb-17	132.50	131.60	129.90	142.80	124.50	126.00	122.10		
28-Feb-17	132.50	129.90	124.00	142.80	124.50	124.60	119.10		
8-Mar-17	132.50	132.50	130.20	142.90	124.50	126.80	123.20		
9-Mar-17	132.50	132.20	129.90	142.90	124.50	126.50	122.90		
10-Mar-17	132.50	131.60	129.90	142.80	124.50	126.00	122.10		
13-Mar-17	132.50	129.90	124.00	142.80	124.50	124.60	119.10		
14-Mar-17	132.50	129.90	124.00	142.90	124.50	124.30	118.50		
15-Mar-17	132.50	129.40	124.00	142.90	124.50	123.90	117.40		
27-Jul-17	132.50	122.50	124.00	142.80	122.90	123.90	116.10		
28-Jul-17	132.50	122.50	124.00	142.80	122.90	123.80	116.50		
3-Oct-17	132.50	128.00	124.00	142.90	124.60	123.00	114.20		
4-Oct-17	132.50	128.00	124.00	142.90	123.60	122.90	114.20		
4-Dec-17	132.50	131.30	130.90	143.00	125.30	126.20	119.60		
5-Dec-17	132.50	130.80	130.40	143.00	125.30	125.80	118.70		
6-Dec-17	132.50	130.70	129.90	143.10	125.20	125.40	117.80		
7-Dec-17	132.50	131.70	131.90	143.30	125.30	126.70	118.30		
8-Dec-17	132.50	132.40	132.10	143.20	125.30	127.40	121.00		
12-Dec-17	132.50	130.50	130.00	143.20	125.30	125.70	119.40		
13-Dec-17	132.50	130.30	129.90	143.30	125.30	125.50	118.80		
16-Jan-18	132.50	130.30	129.80	142.90	125.20	126.10	119.40		
22-Feb-18	132.50	129.20	124.00	142.90	122.80	123.70	116.20		
16-Mar-18	132.50	129.60	130.30	142.80	124.60	124.60	118.80		
20-Apr-18	132.50	128.00	124.00	142.80	123.70	124.50	113.00		
23-May-18	132.50	122.50	124.00	142.80	122.80	123.80	110.90		
13-Jun-18	132.50	122.50	124.00	142.70	122.40	123.40	111.50		
12-Jul-18	126.58	124.77	124.56	142.27	121.63	116.98	110.04		
24-Jul-18	132.50	122.50	124.00	142.70	121.30	122.70	109.60		
25-Sep-18	133.90	128.33	128.97	142.63	122.73	125.45	120.51		
25-Jan-19	132.50	129.40	130.30	142.90	125.20	126.30	119.30		
27-Feb-19	132.50	128.30	130.40	143.00	123.80	123.30	115.40		
22-Mar-19	132.50	128.50	130.30	142.70	124.90	124.20	118.00		
23-Apr-19	132.50	128.30	130.40	142.80	122.90	123.80	112.00		
30-May-19	132.50	128.80	129.80	142.80	123.70	123.40	110.10		
12-Jun-19	132.50	122.50	124.00	142.40	122.90	123.60	115.90		
17-Jul-19	132.50	122.50	124.00	142.80	123.20	124.00	116.50		
14-Aug-19	132.50	122.50	124.00	142.80	122.90	123.90	116.10		
11-Sep-19	132.50	131.70	124.00	143.10	125.30	125.50	117.80		
16-Oct-19	132.50	129.50	124.00	143.00	125.00	123.10	114.20		
13-Nov-19	132.50	131.30	130.20	143.00	125.30	126.20	118.80		
11-Dec-19	132.50	130.80	124.00	143.50	125.00	126.00	118.60		
7-Jan-20	133.69	129.70	130.48	143.62	124.46	126.04	116.18		
22-Jan-20	132.50	132.30	124.00	143.20	125.20	127.30	121.00		
14-Feb-20	132.50	134.40	129.90	144.80	126.80	130.20	124.60		
19-Mar-20	136.70	133.29	133.28	143.23	126.28	128.89	123.12		
19-Mar-20	136.70	133.29	133.28	143.23	126.28	128.89	123.12		

Continued below

	15A	1A	7A	Tip (27)	22A	3A	5A	29	28
15-Jul-20	128.47	126.74	126.00	142.42	121.93		112.66		
18-Aug-20	130.39	128.19	127.45	143.08	122.72		113.88		
9-Sep-20	136.68	132.56	132.68	143.21	123.50		123.84		
6-Oct-20	136.68	132.36	131.04	143.29	123.45		122.35		
17-Nov-20	134.69	131.21	131.66	143.53	124.71		119.64		
2-Dec-20	135.15	132.35	134.36	143.59	125.58		120.59		
11-Feb-21	134.87	131.98	133.56	143.01	125.86	127.81	119.29	148.11	135.92
18-Feb-21						125.61		148.02	135.51
23-Feb-21	135.35	134.94	132.44	143.34	125.33	128.25	121.79	147.91	135.76
17-Mar-21	135.16	132.40	131.04	143.25	123.48	127.39	120.62	147.98	135.65
7-Apr-21	132.66	130.00	130.89	143.34	124.63	126.28	115.82	147.89	136.09
5-May-21	127.55	128.96	126.84	143.23	123.15	122.26	110.93	146.86	135.01
15-Jun-21	126.48	124.75	121.12	142.3	121.78	121.84	109.89	146.45	134.95
7-Jul-21	127.27	128.18	119.97	142.59	121.35	119.66	110.1	146.34	134.43
11-Aug-21	127.5	128	121.54	142.27	120.79	119.95	110.4	145.61	134.25
21-Sep-21	125.66	127.9	117.2	142.02	120.4	119.89	109.75	145.19	134.09
13-Oct-21	130.28	127.47	126.35	142.16	121.24	124.71	116.34	146.13	135.24
8-Nov-21	135.88	132.5	132.88	143.15	123.75	130.08	122.69	148.1	135.73
20-Dec-21	133.21	129.84	130.43	143.46	124.52	132.98	116.76	147.57	136.01
25-Jan-22	129.5	129.06	128.23	143.48	124.27	129.28	113.27	147.37	135.86
15-Feb-22	137.69	132.04	131.41	143.38	123.87	130.09	124.59	148.06	135.82
14-Mar-22	129.5	129.0	128.4	143.3	124.1	125.8	113.3	147.35	135.88
6-Apr-22	127.6	127.7	125.3	143.4	123.3	123.3	111.7	147.26	135.56
4-May-22	127.32	126.5	124.97	143.04	122.59	122.2	110.91	146.72	135.04

Blank readings indicate none were taken usually because they are below the length of the dipper used.

TABLE 4.1 – Groundwater elevations across the site



RICK BRASSINGTON
Consultant Hydrogeologist

Hydrogeological assessment of
High Close Quarry, Plumbland

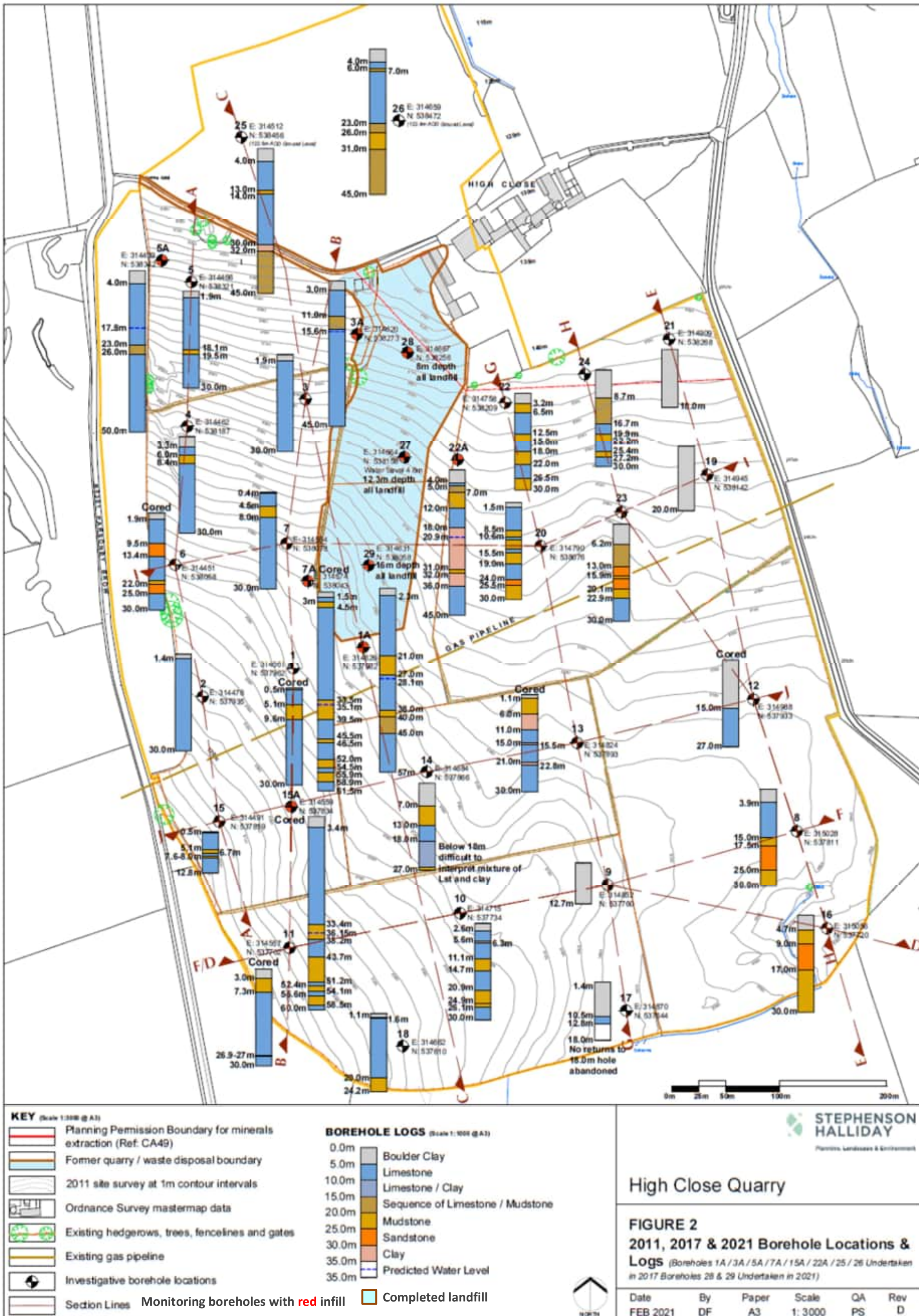
For Stephenson Halliday Ltd

Ref: 1819/August 2022

Figure 4.2 – Groundwater elevations across the site

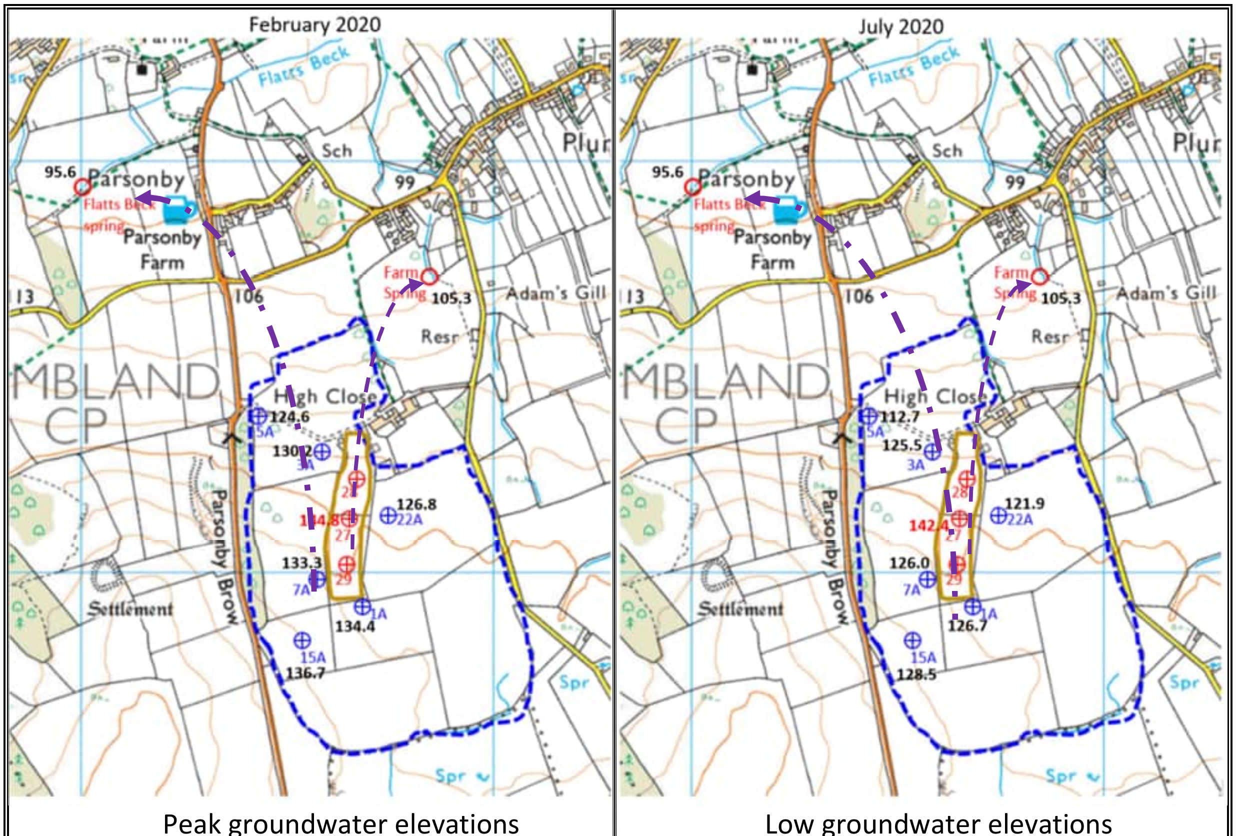
The leachate elevations in BH27, 28 and 29 show it slopes to the north. The groundwater elevations show a flow pattern from south to north.

(See Figure 4.1 for borehole locations)



From Shepherd Halliday

Figure 4.3 – Borehole locations and geology



RICK BRASSINGTON
Consultant Hydrogeologist

Hydrogeological assessment of
High Close Quarry, Plumbland

For Stephenson Halliday Ltd

Ref: 1819/August 2022

Figure 4.4 – Groundwater elevations in 2020

Scale: one kilometre between grid lines

Lines in purple are general groundwater flow

4.9 As the hydraulic conductivity (permeability) of the limestone is controlled by the fracture network and the fractures are associated with the bedding planes and to a lesser extent to faulting, the overall general shape of the permeability network can be estimated from the geological features of the rock and the general direction of groundwater flow can be ascertained from this network and also by using the local ground topography.

4.10 Figure 4.5 (below) shows the two BGS maps for the area with the key being shown in Figure 3.3. The location of the quarry site and the two springs where samples have been taken are also shown. The topography has a fall from south to north as can be seen in Figure 4.4.

4.11 The fracture system associated with the geological structure can be assumed to have two main components, one that is parallel to the bedding planes, and hence the dip, and one that is vertical to the bedding.

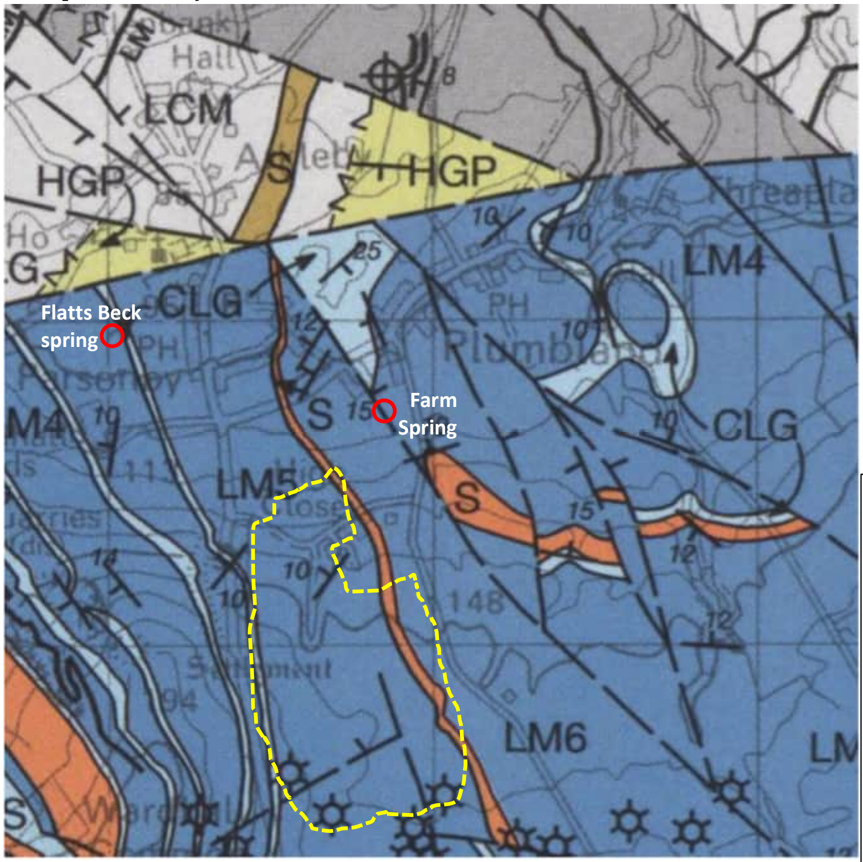


Figure 4.5 (a)
- Solid Geology

Figure 4.5 (a & b)
– Relationship between the springs and the geology

The Farm Spring is controlled by the fault that separates the Sixth Limestone that lies to the east of High Close Quarry and the Fourth Limestone that has been downfaulted to the east.

The Flatts Beck Spring is controlled by the Gilcrux Fault that trends to the east and the overlying glacial boulder clay. The spring emerges through a peat deposit that has formed around it and possibly overlies boulder clay.

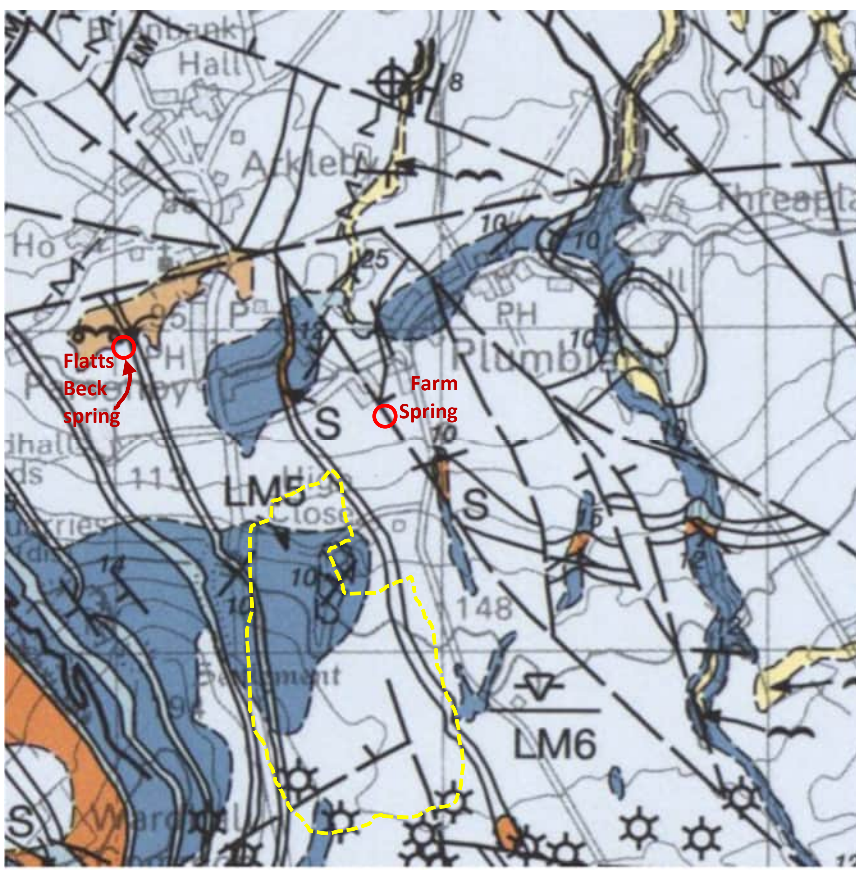


Figure 4.5 (b)
- Drift Geology

4.12 The solid geology map (Figure 4.5 (a)) shows a number of dip readings that are some 10^{o} in the vicinity of the High Close Quarry and point in a northwesterly direction. Flatts Beck Spring lies in this direction as well as the topographical slope being in the same direction. The spring lies at the top of the Fifth Limestone at an elevation of 95.5 mOD where it is overlain by mudstone and siltstone as shown on the BGS map.

4.13 The Gilcrux Fault lies just to the north of the location of the Flatts Beck Spring, and it is concluded that groundwater flows to the northwest from the High Close area. The location of the fault and the mudstone at the top of the Fifth Limestone are the main factors that cause the spring to be in this location together with the glacial boulder clay that overlies the solid rocks. There is no evidence about the thickness of the boulder clay although it may be deduced that the groundwater flow is impeded by the Gilcrux Fault and must push its way to the surface along a route determined by the lithology of the overlying materials.

4.14 The Farm Spring lies to the north-northeast of High Close Quarry and is at a higher elevation that the Flatts Beck Spring (105.3 mOD). It is located on top of a southwesterly trending fault that is downthrown on its eastern side. This spring lies towards the base of the Sixth Limestone that is defined by a sandstone bed which is permeable and so will allow groundwater to flow across it.

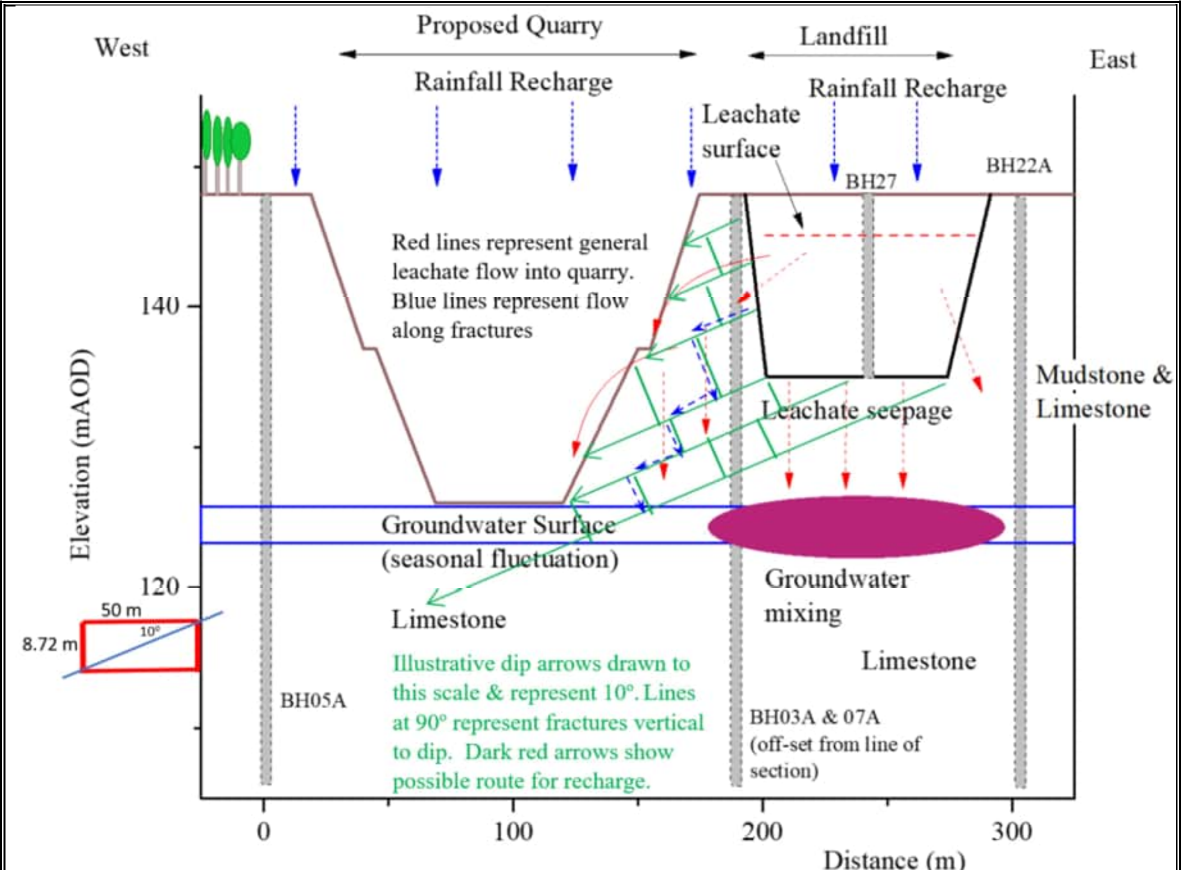
4.15 The groundwater elevations shown in Figure 4.4 measured at the highest elevation in the record in February 2020 and the following low elevation measured in July 2020 (the third lowest measurement) both indicate flow directions towards each of the two springs. Unfortunately, there is not sufficient information available to allow a quantitative estimate of the division of the flow between the two springs.

Fracture system

4.16 The nature of the fracture system is discussed further below in the context of the proposed quarrying and its relationship to the possible impact of the quarrying. On the basis of the geological mapping the fractures are controlled by the dip in the rocks which in this vicinity is some 10^{o} in a generally northwesterly direction. The main fractures will be along the bedding planes with a second set that right angles to it. Some of these fractures will have been enlarged by dissolution of the limestone in the karstification process that enlarges the biggest fractures the most.

4.17 Figure 4.6 (below) is from the TerraConsult report and has been modified by the dip being shown accurately using the horizontal and vertical scales on the diagram. The dip is 10^{o} below the horizontal and the tangent of this angle is $\pi/18 = 0.1745$. A 50 m length from the horizontal scale has been taken and a 8.725 m length from the vertical scale to construct a 10^{o} angle to scale as shown on the left of the diagram.

4.18 The diagram shows a network of bedding plane fractures with a set normal to these fractures all marked in green. The flow route in blue shows leachate moving along bedding plane fractures and then along the vertical fractures until it reaches the water table.



RICK BRASSINGTON *Consultant Hydrogeologist* Hydrogeological assessment of High Close Quarry, Plumbland For Stephenson Halliday Ltd *Ref: 1819/August 2022*	Figure 4.6 – Cross Section through quarry The green lines represent the fracture system that dips at 10° below the horizontal and has been constructed according to the diagram on the left Scale as shown

4.19 The diagram illustrates the way in which leachate flowing through the sides of the landfill can reach the water table in the distance between the landfill and the quarry wall without appearing in the quarry wall. Nevertheless, some leachate may discharge into the quarry and in the Byrne Looby report (2022) it is proposed that this is captured in ditches and possibly treated by using reed beds.

Groundwater quality

4.20 The monitoring programme has included taking samples from the different sample points and sending them to a laboratory for analysis. The samples were taken from 2018 continuing to the present time although the average values from this data set are those considered here.

4.21 The interpretation of the groundwater quality and the degradation of the landfill as indicated by the leachate chemistry is discussed in the separate report by Byrne Looby (High Close Quarry Development Landfill Quarry Hydrogeological Relationship. Report No 2934-R03) and this report only discusses the relationships shown by the chemistry to evaluate the groundwater flow system.

4.22 The average values measured for the major ions is shown in Table 4.2 and has been examined using standard hydrogeological methodologies.

Determinand	units	27A	28A	29A	7A	3A	5A	Flatts Beck	Farm Spring	15A	1A	22A	Limits
Samples represent		Leachate			Adjacent		Down gradient			Up gradient		Adjacent	
pH	pH units	7.0	6.8	7.0	7.0	6.9	7.4	7.6	7.6	7.4	7.6	7.6	6.5- 9.5
Calcium	mg/l Ca	222	210	252	201	193	138	121	110	137	125	86	250
Magnesium	mg/l Mg	44	28	40	20	45	9	6	4	8	6	13	30
Sodium	mg/l Na	90	47	141	45	220	10	15	10	7	19	9	200
Potassium	mg/l K	106	55	112	30	137	4	4	4	3	3	3	-
Chloride	mg/l Cl	84	44	151	50	233	11	21	6	10	17	10	250
Sulphate	mg/l SO_4	7	4	22	21	3	9	16	10	12	10	14	250
Alkalinity	mg/l HCO_3	1,667	906	1,356	634	1,353	345	249	253	329	296	274	-
Ammoniacal-N	µg/l N	14	65	88	17	50	0.14	0.39	0.10	0.18	0.07	0.10	500
Iron	µg/l Fe	9.1	4.6	2.5	0.7	0.1	0.7	1.2	1.0	0.7	0.7	0.7	200
Manganese	µg/l Mn	0.9	1.4	0.9	1.1	3.1	0.2	0.1	0.01	0.01	0.01	0.01	50

Values exceeding drinking water standards shown in red. Alkalinity is not included in the water standards document

Table 4.2 – Average analyses of water samples

4.23 The samples have been divided into five categories according to their location in the groundwater flow system. BH27A, BH28A and BH29A have been drilled into the landfill and are therefore leachate; BH15A and BH1A are upgradient of the landfill and are not contaminated by leachate; BH7A and BH3A are both adjacent the landfill on its western side and BH22A is adjacent to the landfill on the eastern side; and BH5A and the two springs are down stream of the landfill.

4.24 The major ion chemistry defines the overall water chemistry of natural waters with the main chemical features being identified using graphical methods. The data from Table 4.2 have been used to plot Schoeller and Piper diagrams as shown in Figures 4.7, 4.8 and 4.9 below.

4.25 These graphical methods were proposed by Schoeller (1962) and Piper (1944). Both are graphical methods that require the concentrations of the major ions to be expressed in milliequivalents per litre (not milligrams/litre as in the table). Milliequivalent units relate to the reactivity of each element with hydrogen thereby removing the complication of the different molecular weights in such a comparison

4.26 The Schoeller method plots the absolute concentration of each separate ionic species on a logarithmic scale and allows the various solutions to be compared in terms of both their overall strength and ionic make-up. Variations between samples are indicated by different patterns to the lines joining the points on the diagram and by the different position of the points on the plot. The logarithmic scale reduces the height of the graph and assists in making comparisons. It should be noted that the scale starts at 0.01 meq/l and continues to 100 meq/l in the leachate and adjacent boreholes graphs; and is 0.1 meq/l to 10 meq/l in the upstream and downstream graphs.

4.27 The Piper analysis examines the concentrations of the cations and anions as a percentage of the total concentrations by plots in triangular shaped graphs. A diamond-shaped central field covers the overall combined major ion content.

4.28 The Schoeller graph for the leachate samples (Figure 4.7) shows broadly similar shapes although only the values for calcium, manganese and alkalinity are alike. The scale is from 0.01 to 100 meq/l. Those for sodium and potassium, chloride and sulphate show increasing difference in that order. These differences are considered to result from differences in the waste from the locations across the site. The Piper diagram shows that the cations (left-hand graph) record the largest differences with the calcium decreasing from BH28 to BH27 and then BH29 which is from the lower end of the landfill to the upper end. At the same time the manganese remains constant and the sodium and potassium increases. The anions show limited sulphate and almost maximum alkalinity. The values for BH27 and BH28 are identical while those for BH29 show reduced sulphate and increased chloride content. The values in the diamond shaped field show the three leachate samples to be magnesium bicarbonate type.

4.29 The three adjacent boreholes, BH3A, BH7A and BH22A all show different shapes on the Schoeller graph which is taken as indicating that each is affected by the leachate in different ways. The scale is also 0.01 – 100 meq/l. BH3A has similar values for calcium while all the other elements are greater than the other two except for sulphate which is considerably lower. BH3A is to the north and further along the flow path and the analytical results indicate that the values have been increased as groundwater flows past the landfill.

4.30 BH7A has a similar shape to BH3A although the concentrations are all lower except for sulphate. BH7A is at the southern end of the landfill on the western side, and this is interpreted as being the early stages of the impact of leachate compared with BH3A. BH22A is at the northern end of the landfill opposite BH3A and on the easter side but shows the least dissolved minerals except for sulphate. This is interpreted as the leachate flows being less on the eastern side which is in the opposite direction to the dip.

4.31 The Piper graph shows greater differences in both the cations and anions than the leachate graphs. BH3A has much less calcium and much more sodium and potassium than the other two samples, and increased chloride and reduced sulphate. The diamond shaped field shows that all three samples are also magnesium bicarbonate type.

4.32 All five of the upstream and downstream samples follow similar patterns which indicates that the chemistries are all influenced by the geology rather than the leachate. The scale is 0.1 – 10 meq/l, only two divisions rather than the four for the two previous groups, again showing the differences between them. The calcium and alkalinity values are all similar with the other minerals varying. The only sample to have a slightly different shape is the Farm Spring which has the lowest values for all parameters except for sodium and potassium and also a slightly reduced chloride value. This is interpreted as the High Close Quarry site is only a small part of the spring catchment. The shape for the Flatts Beck Spring is generally greater than the others indicating that the impact of the much larger catchment with the High Close Quarry forming a small component.

4.33 The Piper diagrams show all the samples to be exceedingly similar with them plotting almost on top of each other. They are in the bottom left hand side of the cation triangle and in the same position in the anion one. The plot on the diamond shaped field shows all the waters to be of the magnesium bicarbonate type.

4.34 The conclusions from this analysis of the groundwater level and quality data shows that:

- The groundwater elevations show a flow to the northwest towards the Flatts Beck Spring.
- It is possible that there is a component of flow towards the Farm Spring although this is not certain.
- The elevation of the leachate in the landfilled wastes lies above the groundwater elevations across the site.
- The main leakage from the landfill is on the western side.
- The concentration of leachate-derived contaminants in the groundwater flow down the western side of the landfill increases from south to north.
- The contamination of BH22A on the northeastern side of the landfill is much less than that in the boreholes to the west and arguably may mean that the contamination does not occur.
- The two springs do not appear to be contaminated by the leachate flow.

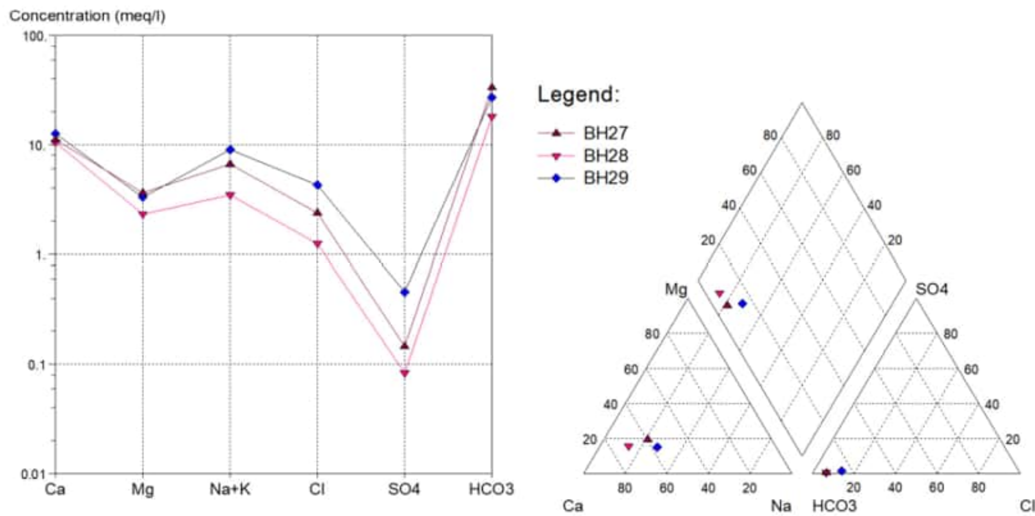


Figure 4.7 – Schoeller and Piper plots of the leachate

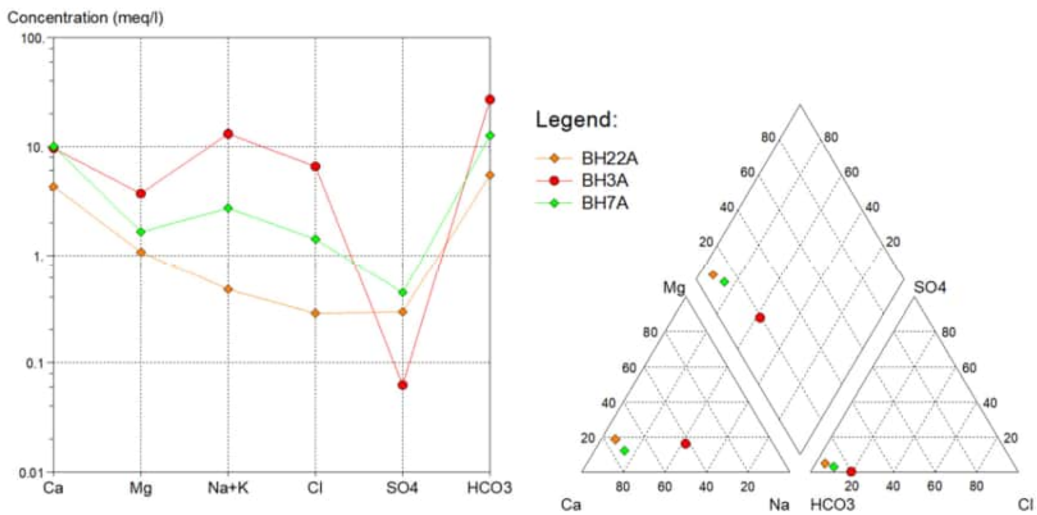


Figure 4.8 – Schoeller and Piper plots of adjacent boreholes

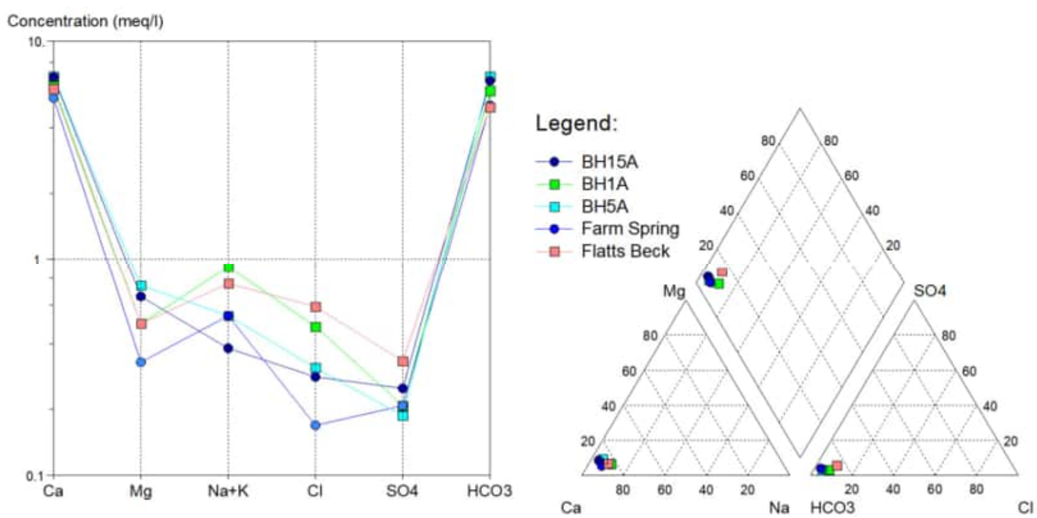


Figure 4.9 – Schoeller and Piper plots of upstream and downstream boreholes

5. Discussion & conclusions

5.1 The proposal is for the High Close Quarry to be reopened and limestone worked on the western side of the old landfill that infills the former quarry workings and lies in the centre of the permissions site.

5.2 The limestone has a negligible primary permeability, and the groundwater is contained in and flows though a network of fractures related mainly to the bedding and dip of the strata with a few fractures associated with faulting. The larger of the original fractures will have been enlarged by the limestone dissolved in the flowing groundwater in a process known as karstification.

5.3 The dip is at 10^{o} to the northwest in this area and there is one spring that lies in that direction located some 250 m to the northwest of Parsonby village.

5.4 Samples from the nine boreholes and two springs have provided information on the groundwater conditions in the limestone in terms of its quality and flow direction and the relationship with the leachate in the old landfill, especially since January 2020 when the monitoring was extended to include the two local springs.

5.5 The flow direction is towards the northwest in the direction of the Flatts Beck Spring at Parsonby. This spring is the source of the Flatts Beck that is a tributary of the River Ellen.

5.6 There is a possible smaller component of flow on the east side of the site discharging at the Farm Spring just to the south of the western end of Plumbland. The Farm Spring is the head of a small tributary of the Flatts Beck.

5.7 The elevation of leachate in the former landfill represents the highest level in the area and is substantially above that of the water table that lies beneath it. The base of the landfill is at an elevation of some 135 mOD and is understood to be unlined in its base and along its sides. It can be concluded therefore, that the leachate drains slowly away from the landfill and will cascade into the local groundwater flow system.

5.8 The landfill is some 50 years old and has ben closed for some 30 years. As a dilute and disperse site it can be concluded that the leachate production is at an advanced stage and the leachate does not represent a threat to the local water resources. This is demonstrated by the unpolluted nature of the two monitored springs.

5.9 The proposal for quarrying is to excavate rock only on the west side of the site and to reduce the volume of leachate flowing into the quarry a standoff is proposed that will be some 38 m at the top of the site increasing to some 66 m at the bottom of the site.

5.10 Groundwater flow through the fracture system will involve flow in both the bedding plane fractures and fractures at right-angles to the bedding planes.

This means that in effect vertical flow takes place and will significantly reduce the flow into the eastern wall of the quarry void.

5.11 The risk of flooding had been assessed by consulting the government's website https://flood-map-for-planning.service.gov.uk/. The site is located at an elevation above the susceptible areas and not flooding is expected. Figure 5.1 shows the map for the area and identifies those areas where flooding is expected to occur.

Conclusions

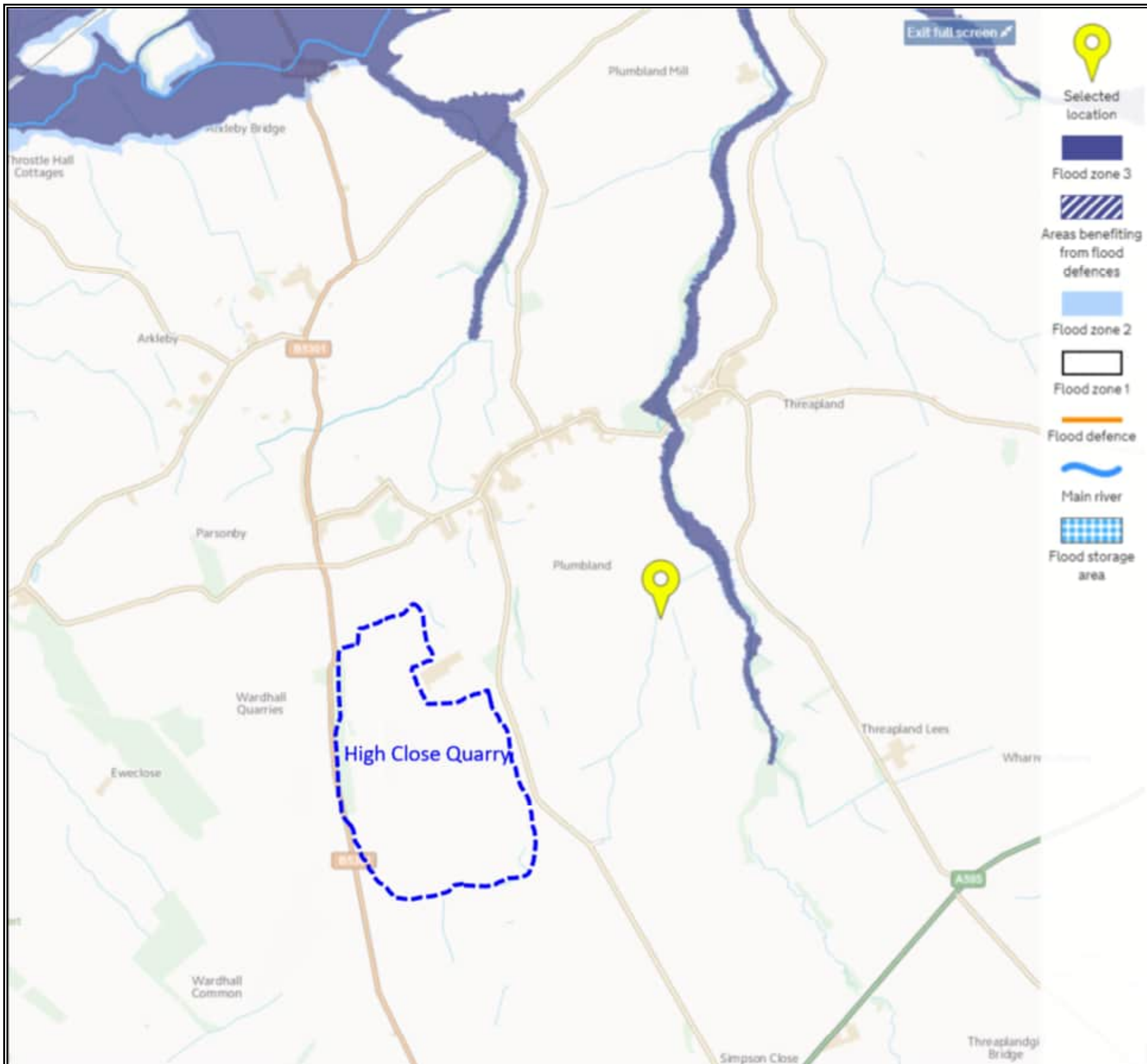
5.12 The elevation of the water table has been defined by a series of boreholes that show the flow is to the northwest with a possible component to a spring that lies to the north of the site.

5.13 The proposals are to limit the depth of excavation so that it generally does not go below the water table. Consequently, there will be no need for dewatering or any impact on the local water resources.

5.14 The proposals are to leave the existing landfill on the site and not to excavate the tipped materials. The design of the quarry operations is however for an offset of between 29 m to 40 m at the ground surface. The standoff distance then increases with depth to the base of the quarry to between 64 m and 90 m from the landfill. A stand-off of some 38 m to 66 m will be left from the landfill which may allow leachate to percolate to the water table before it reaches the quarry. Nevertheless some leachate could flow from the quarry walls and in such an event it is proposed that this is collected and treated possibly using reed beds.

5.15 The small water bodies at the Clints Quarry some 1.5 km away will not be affected as the High Close Quarry will not be excavated to below the local water table and therefore will not be dewatered.

5.16 There is no flooding risk to or from the site due to its elevated location. Any small-scale groundwater pumping that may be undertaken will be to discharge it to a soakaway on the northern boundary and not to local watercourses.



<u>RICK BRASSINGTON</u> *Consultant Hydrogeologist* Hydrogeological assessment of High Close Quarry, Plumbland For Stephenson Halliday Ltd *Ref: 1819/August 2022*	Figure 5.1 – Local Flood Risk Map Not to Scale Reproduced from ©Ordnance Survey maps under Copyright Licence No AL 52636A0001 and © Crown copyright and database rights 2018 OS 10002419

APPENDIX – Responses by the Environment Agency

Letter 1: Dated 11th May 2018

Mrs R Brophy (Planning Officer)
Cumbria County Council
Development Control
County Offices
Busher Walk
Kendal
LA9 4RQ

Our ref: NO/2018/110747/01-L01
Your ref: Scoping2017

Date: 11 May 2018

Dear Rachel

CONSULTATION ON A REQUEST FOR A SCOPING OPINION - PROPOSED APPLICATION FOR THE DETERMINATION OF CONDITIONS UNDER THE ENVIRONMENT ACT 1995 TO WHICH THE DORMANT MINERALS PLANNING PERMISSION REFERENCE CA49 (GRANTED PERMISSION BY THE FORMER CUMBERLAND COUNTY COUNCIL ON THE 8TH DECEMBER 1954) IS TO BE SUBJECT. THE PROPOSAL WILL ALSO INCLUDE AN AREA FOR PLANT, STOCKPILING AND STORAGE WHICH ALL RELATE TO THE QUARRYING OF LIMESTONE. ALSO INCLUDING A PLANNING APPLICATION FOR AN IMPROVED SITE ACCESS AS THE FORMER ACCESS WAS NOT CONSIDERED SUITABLE BY THE HIGHWAY; HIGH CLOSE QUARRY, PLUMBLAND, ASPATRIA, CUMBRIA

I refer to our recent phone conversation regarding the above Scoping Opinion consultation which was originally forwarded to the Environment Agency for comment on 28 April 2017. Unfortunately we have no record of replying to this consultation request and I apologise for any inconvenience this may have caused. I have however consulted our technical specialists since receiving a copy of the Scoping Report on 27 April 2018 and their comments are provided below:

The hydrogeology of groundwater flow in limestone geology is complex and variable often dominated by fissure flow solution features. The report states a geological & hydrogeological appraisal was completed in late 2016, early 2017 outlining angle of dip being 6-10 degree West or North west along the bedding plane based on borehole logs drilled to 40-60m. We cannot comment on the findings of this because it was not submitted with the application. This appraisal recognises the need for further hydrogeological assessment, however, we cannot comment on the extent of proposals for further work until the Geological & Hydrogeological Appraisal has been submitted.

We accept the proposal requires an Environmental Impact Assessment and this should review the impact of blasting on fractures/fissures in the geological beds and the impact (if any) on nature and dimension of groundwater flow.

Any changes on the impact of direction, orientation and volume of flow could have a direct and derogatory effect on the quality of groundwater associated with leachate from the landfill. The further hydrogeological work recognised in paragraph 18.5 of the report needs to include risk assessment to this effect and the proposal for a 15m buffer from the landfill needs adequate justification.

Paragraph 8.3 of the report infers there is no groundwater pollution, as it has not been detected over the years. This is a nonsense because the resolution for the landfill written by Cumbria County Council did not require groundwater monitoring in its conditions for operation. The site was closed before the formation of the Environment Agency, therefore, there has been no statutory provision to monitor because no current permit exists.

Paragraph 18.2; Cumbria County Council has forwarded some surface water monitoring results, but their meaning in terms of their representation has never been clarified. Surface water run-off post restoration at this site should be relatively uncontaminated, if it represents field drainage over the landfill cap. Further information regarding landfill drainage and samples is required. Information regarding leachate monitoring and control should be included with the application.

Since the landfill site has no permit and is essentially brownfield with the potential for status as contaminated land under EPA 1990 Part 2A, the planning detail should effectively investigate the site as it would under the auspice of inspection for Part 2A. This essentially requires, site investigation and risk assessment, some of which may have been completed. Defra guidance can be found on the Defra website and in particular guidance Note CLR11.

The boreholes drilled to establish potential for quarrying should be used to obtain groundwater samples (if possible) to help with the hydrogeological risk assessment. The proposed quarry may encourage migration of polluting leachate. It could act as a sink for collection of polluted groundwater and therefore a contingency plan for management of leachate both in the quarry and landfill should be integrated into operational conditions. This will depend on the findings of the ground investigation and risk assessment.

It should be noted that whilst the landfill condition on the Resolution required lining of the quarry prior to landfill. There is evidence to prove some of this work was not undertaken.

The EIA will need to be supported by a Hydrogeological Impact Assessment (HIA) which will need to include:

- A water features survey.
- The existing topography and drainage network of the site.
- The highest natural variation in the water table across the area of the proposed development. At least 2 years of monitoring from boreholes that enclose the site. The logs and installation details of each monitoring point will be required.
- Include sufficient geological plans and cross sections to adequately and clearly show the three dimensional relationship between the aquifers and the highest natural water levels therein within the existing topography, the proposed lowest excavation surface and the proposed final restoration surface.
- All levels on the logs, plans and water levels will need to be related to Ordnance Datum.
- A water management plan which will need to include potential mitigation measures to manage the potential inflow of contaminated water/leachate from the adjacent landfill.

Please contact me on the details below should you have any queries or require further clarification.

Yours sincerely
Jeremy Pickup
Planning Advisor - Sustainable Places

E-mail clplanning@environment-agency.gov.uk

Letter 2: Dated 3rd August 2018

Mr A Perry - Senior Planner
Stephenson Halliday Ltd
32 Lowther Street
Kendal
Cumbria
LA9 4DH

Our ref: NO/2018/110747/02-L01
Your ref: Scoping2017

Date: 03 August 2018

Dear Mr Perry

SCOPING OPINION - ENQUIRY RECEIVED 17 MAY 2018; HIGH CLOSE QUARRY, PLUMBLAND, ASPATRIA, CUMBRIA

I refer to your email to Rachel Brophy dated 17 May 2018 and write to provide the following comments which have been provided by our contaminated land specialist. Please note we are unable to provide comments from our groundwater specialist due to dry weather incident duties taking priority.

The latest correspondence assures the Planning Authority that the EIA will include reports on the monitoring, hydrogeological assessment and geotechnical assessment and that it will also address the information requirements outlined in the Environment Agency's letter of 11 May 2018. Since these reports will be reviewed accordingly when the EIA is submitted, the detail, understanding and agreement of environmental aspects need to provide sufficient evidence to demonstrate the development will not cause an unacceptable risk of pollution. This information will be key to acceptance of the proposal.

The responsibility for landfill risk assessment under Part 2A should quite rightly be "appropriate persons" i.e. polluters, landowners or occupiers of land and therefore the onus for investigations should be a matter for Cumbria County Council providing there is no overlap of the area defined by the landfill resolution and the 15m buffer exists between the waste and the quarry proposal. In the absence of confirmed landfill survey plans, the proposed buffer should be defined from the perimeter of the landfill resolution plan.

Likewise the proposed base of quarrying is planned to be above the water table to avoid potential inflow of groundwater and/or leachate contaminated groundwater from entering the quarry void. If groundwater levels derived from boreholes outside the landfill are below the invert level of the base of the landfill, limitations on quarrying should be defined, as a precaution, from the landfill base level unless a contingency plan for possible collection and evacuation of contaminated groundwater from the landfill has been agreed. Although the landfill was planned to be semi-contained with a clay basal seal, the liner would not have :

1. sealed sidewalls and
2. been engineered to earthworks specification.

In addition, there is evidence that the clay was absent from the first layers of deposit in the quarry. Therefore the landfill should not be considered as having adequate hydraulic containment.

Yours sincerely
Jeremy Pickup
Planning Advisor - Sustainable Places

E-mail clplanning@environment-agency.gov.uk
cc R Brophy, Cumbria County Council

Letter 3: Dated17th October 2019

Cumbria County Council
Environment - Planning & Sustainability
CountyOffices
Busher Walk
Kendal
Cumbria
LA9 4RQ

Our ref: NO/2019/112052/01-L02
Your ref: 2/19/9010
Date: 17 October 2019

Dear Sir/Madam
APPLICATION FOR THE DETERMINATION OF NEW PLANNING CONDITIONS UNDER THE ENVIRONMENT ACT 1995 (AS AMENDED) FOR THE DORMANT MINERALS PLANNING PERMISSION REFERENCE CA49 INCORPORATING AN AREA FOR PLANT, STOCKPILING AND STORAGE; HIGH CLOSE QUARRY, HIGH CLOSE FARM, PLUMBLAND, ASPATRIA, WIGTON, CA7 2HF

Thank you for consulting us on the above application on, 9 September 2019.

Environment Agency position

We object to this development because there is insufficient information to demonstrate that the risk of pollution to controlled waters is acceptable. We therefore recommend that planning permission is refused.

Reasons

The proposed planning permission area includes a former domestic landfill which is known to be leaching contaminants into groundwater. A 15m buffer is proposed to segregate quarrying proposals from the landfill, but there is no data regarding the presence of organic and inorganic Hazardous Substances likely to be present in the leachate and contaminated groundwater. The quarrying proposal presents a risk that could exacerbate mobilisation and pollution potential of unknown Hazardous Substances into the underlying aquifer. The application's Hydrogeological report 2019 does not demonstrate that the risks of pollution have been understood or provide adequate mitigation for these risks.
This planning application has therefore failed to meet the requirements of paragraphs 170 and 178 of the National Planning Policy Framework.

Overcoming our objection

The applicant should provide information to demonstrate to the planning authority that the risk to controlled waters has been fully understood and can be addressed through appropriate measures. The hydrogeological report of June 2019 has been reviewed in context of the potential impact of development from the former County landfill site. It acknowledges that migration of leachate is occurring from BH27 inside the landfill to BH7A, although it is draining very slowly.

The data provided supports the understanding for a conceptual groundwater flow direction from South to North based on the quality of boreholes 15A and 5A, although it is acknowledged that fissure flow can transmit groundwater in circuitous and unpredictable routes. The report suggests there are discrepancies in laboratory analysis between sampling rounds. Laboratory reports should be submitted to ensure quality assurance comply with UKAS accreditation.

The groundwater analysis does not cover seasonal variation and is limited to general groundwater chemistry. Assessment for leachate analysis should be referenced from current waste management guidance and include organic analysis and metals.

We agree the 15 metre buffer between landfill and quarry should not have any impact on whether the landfill was lined or not. However, there has been no review of the effect of blasting/quarrying on: fractures/fissures, transmission and quality of leachate migrating from the landfill mass. The impact from quarrying activities could have a direct and increased derogatory effect on the quality of groundwater entering the quarry which is already contaminated with leachate. The applicant in knowledge of the increased pollution potential from this development is required to take responsibility for treatment of contaminated groundwater entering the quarry. In knowingly permitting discharge of the groundwater via the proposed soakaway, the Agency can only endorse the discharge of uncontaminated water.

The limitations stating that basal excavations should not generally go below the water table is acceptable.

It must be stressed that a more comprehensive list of organic and inorganic contaminants is required to be assessed from the leachate and groundwater monitoring installations. The Agency cannot determine acceptable risk of this development without an assessment of the presence or absence of Hazardous / Listed Substances.

If, following further investigation, substances prohibited from discharge to groundwater are identified, the outlined proposals for an interceptor for suspended solids prior to discharge via soakaway as the sole form of treatment is unacceptable.
We recommend the applicant develops a detailed contingency plan for management, interception and treatment of contaminated groundwater. The Agency will object to any soakaway discharge in the absence of further assessment.

Note to applicant
Should you wish us to review any technical documents or want further advice to address the environmental issues raised, we may do this as part of our charged for planning advice service.
Further engagement will provide you with the opportunity to discuss and gain our views on potential options to overcome our objection with us, before formally submitting further information as part of your planning application. It should also result in a better quality and more environmentally sensitive development.
As part of our charged for service we will provide a dedicated project manager to act as a single point of contact to help resolve any problems. We currently charge £100 per hour, plus VAT. We will provide you with an estimated cost for any further discussions or review of documents. The terms and conditions of our charged for service are available here.
If you would like more information on our planning advice service, including a cost estimate, please contact us at clplanning@environment-agency.gov.uk.

Yours faithfully
Mr Jeremy Pickup
Planning Advisor - Sustainable Places
Direct e-mail clplanning@environment-agency.gov.uk

Letter 4: Dated 27th May 2020

Mr P Stephenson
Stephenson Halliday Ltd.
20 Lowther Street
Kendal
Cumbria
LA9 4DH

Our ref: NO/2020/112464/02-L01
ENVPAC/1/CLA/00094
Your ref: 2/19/9010

Date: 27 May 2020

Dear Peter

HYDROGEOLOGICAL RELATIONSHIP REPORT PRODUCED BY TERRA CONSULT; HIGH CLOSE QUARRY, HIGH CLOSE FARM, PLUMBLAND, ASPATRIA, WIGTON, CA7 2HF

Thank you for forwarding the above report which we received on 7 May 2020, we have considered the report and can comment as follows:

The Environment Agency accepts the Hydrogeological Relationship Report produced by Terra Consult (ref.no. 2934-R01 dated April 2020) as a technical addendum to the hydrogeological report. It provides an enhanced understanding of previous information submitted with the planning application which is based on the presence of existing monitoring points and data provided from these sampling points.

The report has not reviewed if sampling is fit for purpose in terms of true representation of the pollutant source and if sampling is adequate to intercept the pollutant plume within groundwater. This report appears, instead, to utilise existing information to build on and make the assessment fit the findings. It is imperative that sampling locations and monitoring are meaningful and representative, otherwise the extrapolation of data, theoretical understanding and conclusions drawn from the data is incorrect.

In overcoming the objective to fully understand the hydrogeology and geochemistry, there is a requirement to determine if sampling is fit for purpose i.e. characterise the source of pollution and highlight shortfalls with recommendations to fill the gaps. In the absence of an integral leachate management infrastructure, the single well 27a is insufficient. A review of historical survey / x-sections, further assessment is required to establish if there are other phases of landfill that are deeper than 27a or could accumulate a hydraulically isolated leachate head. The assessment and justification for drilling positions of new boreholes should be provided.

There is also concern that the leachate sample results do not reflect in situ worst case conditions. The site is not capped to an engineered specification and it is possible there is an influence from rainfall infiltration through waste, diluting the upper leachate layers. All remedial proposals likely to influence leachate production, dilution, dispersion and discharge should be considered. Interception of leakage into the quarry from springs as outlined is one ad hoc solution during operational life of the quarry. However in planning remediation both during operational life and restoration, an options appraisal and contingency plan of other remedial solutions should be provided together with an ongoing monitoring programme.

Landfill risk assessments normally use “LandSim” model as a standard and where there are limitations of the model, these are outlined and justified. Dye tracing methodology has also been effective in limestone quarried landfills and has been used successfully at Flusco and Kendal fell landfill to determine fissure flow movement for hydrogeological risk assessments. The report has not credited/reviewed these tools and methodologies and this oversight should be rectified.

Further work and responses to concerns as outlined above are required. Should you wish to discuss these matters further, please do not hesitate to contact Peter Bardsley on 020 302 55822 or myself on the number below.

Yours sincerely

Mr Jeremy Pickup
Planning Advisor - Sustainable Places

[redacted]
E-mail clplanning@environment-agency.gov.uk

Letter 5: Email dated 18th August 2020

From: Pickup, Jeremy [redacted]
Sent: Tuesday, 18 August, 2020 7:08 AM
[redacted]
Subject: RE: HYDROGEOLOGICAL RELATIONSHIP REPORT PRODUCED BY TERRA CONSULT; HIGH CLOSE QUARRY, HIGH CLOSE FARM, PLUMBLAND, ASPATRIA, WIGTON, CA7 2HF

Good morning Peter,
We have considered your request and feel that there is limited merit in having another meeting until such time that the further work to inform the planning application outlined in our previous correspondence has been undertaken. Compliance of the planning conditions for risk assessment and remediation is necessary to ensure the proposed development does not cause or exacerbate pollution from the former landfill and in doing so, meet the objectives of NPPF178; i.e. the site should not be capable of being determined as "contaminated land".

To establish risk, there is a need to obtain representative samples of leachate as the source/potential source of pollution. When sufficient evidence has been provided, it will be possible to consider the consequence of leachate seepages into the quarry and design contingency for collection and treatment/disposal and associated permitted activities for discharge into groundwater at a later stage of development.

The installation of further leachate wells and sufficient data to characterise the leachate, as recommended at the last meeting (and outlined in our previous letter) is the means by which we can move forward with this development and we would be happy to discuss the outcome of such further investigations when they are completed.

Kind regards

Jeremy Pickup
Planning Advisor | Sustainable Places Team | Cumbria & Lancashire Area
Environment Agency

tel: 020 302 55764 email: [redacted]

Working in partnership to enable sustainable growth and create better places for people and wildlife

Letter 6: Dated 16th September 2020

Mr Peter Stephenson		**Our ref:**	NO/2020/112464/03-L01
Stephenson Halliday Ltd.		**Your ref:**	2/19/9010
20 Lowther Street			
Kendal		**Date:**	16 September 2020
LA9 4DH			

Dear Peter

CONSULTATION ON HIGH CLOSE QUARRY, PLUMBLAND, TECHNICAL NOTE: HYDROGEOLOGICAL CONSIDERATIONS - REPORT PREPARED BY STEPHENSON HALLIDAY LIMITED & TERRA CONSULT LIMITED, DATED SEPTEMBER 2020

Thank you consulting us on the above Technical Note which we received on 8 September 2020. We have considered the report and can comment as follows:

We accept that comments derived from consultation reviews of the ROMP are non-statutory and regulatory determination is a matter for Cumbria County Council as Minerals and Waste Planning Authority.

The latest email and attachment outline the context of the proposal, but there is insufficient data on the landfill leachate as a source of pollution. Samples from the single leachate well are unlikely to be representative and therefore any assumptions or assessments drawn from data are flawed.

It is unfortunate that the recommendation from the last meeting and agreement to install further leachate monitoring wells has not been progressed. The Environment Agency cannot move forward until this issue has been resolved.

Apart from the continued monitoring of existing points, no new information has been presented as evidence derived from the landfill and therefore it is our view that a meeting serves no purpose to advance discussions and understanding.

Yours sincerely

Mr Jeremy Pickup
Planning Advisor - Sustainable Places

E-mail clplanning@environment-agency.gov.uk

Letter 7: Dated 22nd December 2020

Mr Peter Stephenson
Stephenson Halliday Ltd.
20 Lowther Street
Kendal
Cumbria
LA9 4DH

Our ref: NO/2020/112464/04-L01
Your ref: 2/19/9010

Date: 22 December 2020

Dear Peter

APPLICATION FOR THE DETERMINATION OF NEW PLANNING CONDITIONS UNDER THE ENVIRONMENT ACT 1995 (AS AMENDED) FOR THE DORMANT MINERALS PLANNING PERMISSION REFERENCE CA49 INCORPORATING AN AREA FOR PLANT, STOCKPILING AND STORAGE; HIGH CLOSE QUARRY, HIGH CLOSE FARM, PLUMBLAND, ASPATRIA, WIGTON, CA7 2HF

Thank you for your email which we received on 11 December 2020.

The proposal to install an extra leachate monitoring in the Northern area of the landfill is satisfactory for what was known as Phase 1 of the landfill. The original drawing shows the lowest point to be at 128.5 AOD and this level defines the surface of the pond that was pumped out prior to infilling. There are no recorded levels of the base of this pond. However, since this was the sump for the quarry, it would be reasonable to site the new installation in the pond area, set to a level below 128.5m AOD. It should be noted that the x-section G-G on drawing ref. E108.33/05/7/Amo for Phase 1 of the site licence shows limited waste deposited in this area (3 layers @ 2-2.5m depth/layer). A clay bund traversed the quarry floor from SW to NE separating and hydraulically isolating leachate between Phases 1 from Phase 2. It was installed to segregate clean water from leachate during landfilling operations.

Borehole 27 is sited in Phase 2 which, when compared to x-section F-F shows a depth of waste representing the equivalent of 5 layers of waste. The proposals for two leachate monitoring wells should be sufficient to represent characteristics of leachate in Phases 1 and 2, but not Phase 3.

The 4m wide x 2m high clay bund that traverses the site between Phase 2 and Phase 3 is similar in orientation and purpose to the bund separating Phase 1 and 2. Phase 3 represents the deepest landfilled area of 12 layers of waste from 19.4m- 159m AOD in section B-B and 137.4m -156.2m AOD in section C-C. Whilst the landfill base in Phase 3 is not the lowest topographical level, because of the inclined bedding; it does represent the greatest volume of waste and greatest leachate productive capacity of the 3 phases of landfill.

In order to holistically characterise the landfill leachate, sampling is required in all phases and another installation should be installed in Phase 3.

Yours sincerely

Mr Jeremy Pickup
Planning Advisor - Sustainable Places
E-mail clplanning@environment-agency.gov.uk
cc Cumbria County Council

Letter 8: Dated 25th January 2021

Mr P Stephenson		**Our ref:**	NO/2020/112464/05-L01
Stephenson Halliday Ltd.		**Your ref:**	2/19/9010
20 Lowther Street			
Kendal		**Date:**	25 January 2021
Cumbria			
LA9 4DH			

Dear Peter

EMAIL CORRESPONDENCE RE PROPOSED MONITORING BOREHOLES; HIGH CLOSE QUARRY, HIGH CLOSE FARM, PLUMBLAND, ASPATRIA, WIGTON, CA7 2HF

I refer to the email received from Craig Fannin on 20 January 2021.

Following discussions with Peter Bardsley I can confirm that the locations of all 3 boreholes, including the third borehole in the southern part of the site are agreeable to us, and we have no further comments.

Yours sincerely

Mr Jeremy Pickup
Planning Advisor - Sustainable Places

E-mail clplanning@environment-agency.gov.uk

APPENDIX 11:
LANDFILL – QUARRY
HYDROGEOLOGICAL RELATIONSHIP

TerraConsult

July 2022
Report No 2934-R03

HIGH CLOSE QUARRY DEVELOPMENT

LANDFILL QUARRY HYDROGEOLOGICAL RELATIONSHIP

Prepared for

Stephenson Halliday Limited

HIGH CLOSE QUARRY DEVELOPMENT

LANDFILL QUARRY HYDROGEOLOGICAL RELATIONSHIP

July 2022

Carried Out For:

Stephen Halliday Limited

Prepared By:

TerraConsult

TerraConsult Limited
9 The Courtyard
Phoenix Square
Wyncolls Road
Colchester
CO4 9PE

Tel: 01206 585600
E-mail: mailbox@terraconsult.co.uk

DOCUMENT INFORMATION AND CONTROL SHEET

Document Status and Approval Schedule

	Title
Report No 2934-R03	**HIGH CLOSE QUARRY DEVELOPMENT** **LANDFILL QUARRY HYDROGEOLOGICAL RELATIONSHIP**

Issue History

Issue	Status	Date		Signature	Date
1 (R01)	Draft	April 2021	**Prepared By:** Craig Fannin	[redacted]	06/04/201
			Checked By: John Baxter		07/04/21
			Authorised By: Craig Fannin		12/04/21
2 (R02)	Final	April 2021	**Authorised By:** Craig Fannin		14/04/21
3	Final	July 2022	**Authorised By:** Craig Fannin		18/07/22

DISCLAIMER

This consultancy contract was completed by TerraConsult (South) Ltd on the basis of a defined programme and scope of works and terms and conditions agreed with the client. This report was compiled with all reasonable skill, and care, bearing in mind the project objectives, the agreed scope of works, the prevailing site conditions, the budget, the degree of manpower and resources allocated to the project as agreed.

TerraConsult (South) Ltd cannot accept responsibility to any parties whatsoever, following the issue of this report, for any matters arising which may be considered outwith the agreed scope of works.

This report is issued solely to the client and TerraConsult cannot accept any responsibility to any third parties to whom this report may be circulated, in part or in full, and any such parties rely on the contents at their own risk.

HIGH CLOSE QUARRY DEVELOPMENT

LANDFILL QUARRY HYDROGEOLOGICAL RELATIONSHIP

CONTENTS

Appendices

1. INTRODUCTION

1.1 Background

This report has been prepared by TerraConsult Ltd (TCL) (now ByrneLooby) on behalf of Stephenson Halliday Limited for Thomas Armstrong (Aggregates) Ltd in response to further regulatory comments and queries raised in response to a Review of Mineral Permission application in respect of the dormant mineral permission for a limestone quarry adjacent to the closed Cumbria County Council High Close Landfill Site, Plumbland Cumbria. This report is an update of previous versions (Reports 2934-R01 and R02) to take into consideration the additional monitoring data collected since the previous versions were prepared in 2020 and 2021

The original planning application with the Environmental Statement (ES) was submitted in August 2019. In June 2020 Cumbria County Council issued a Schedule of Further Information Requirements under Regulation 22. In relation to hydrogeology and the landfill site a significant amount of information was requested primarily to address comments raised by the Environment Agency and the EHO of Allerdale Borough Council

This report addresses all the Regulation 22 further information requirements relating to landfill and hydrogeology, particularly the queries in the Environment Agency's consultation letter response of October 2019[1] which recommended that planning permission is refused because "*there is insufficient information to demonstrate that the risk of pollution to controlled waters is acceptable".*

A hydrogeological assessment was prepared on behalf of the applicant and submitted as part of pre-application Scoping Report. It was revised and updated following consultation responses received from the Environment Agency on the 11th May 2018 and the 3rd August 2018. The revised hydrogeological assessment was submitted with the application and Environmental Statement as follows:

Prof. R. Brassington (June 2017) Hydrogeological assessment for an application for the determination of conditions in respect of the dormant planning permission reference CA49 at High Close Quarry, Plumbland, Cumbria.

Prof. R. Brassington (Jan 2019) Hydrogeological assessment for an application for the determination of conditions in respect of the dormant planning permission reference CA49 at High Close Quarry, Plumbland, Cumbria. (included as Appendix 10 to):

Stephenson Halliday Ltd (August 2019) High Close Quarry, Near Cockermouth, Cumbria. Dormant Planning Permission Ref CA49. Environmental Statement.

- Chapter 13: Geology and Geotechnical.
- Chapter 14 Hydrology and Hydrogeology

To address the Environment Agency's comments of October 2019, TerraConsult were engaged by the applicant in February 2020 and produced the following report -TerraConsult (April 2020) High Close Quarry Landfill Hydrogeological Relationships. Rep. 2934-R01, which was submitted to the Environment Agency.

---

[1] Environment Agency (October 2019) Application for the determination of new planning conditions under the Environment Act 1995 (as amended) for the dormant minerals planning permission Reference CA49 incorporating an area for plant, stockpiling and storage, High Close Quarry, High Close Farm, Plumbland, Aspartria, Wigton, CA7 2HF. Letter Ref. NO/2019/112052/01-L02, dated 17 October 2019

Following this, there were further responses from the Environment Agency (27th May 2020, 18th August 2020, 16th September 2020, 22nd December 2020 and the 21st January 2021) all of which have been taken into account.

Allerdale Borough Council's Environmental Health Officer (EHO) commented in November 2019 on the August 2019 application, raising environmental concerns in respect of the former landfill site[2]. However, following the submission and the EHO's consideration of the TerraConsult April 2020 report, the EHO confirmed by letter dated the 14th July 2020 that the report adequately addresses the concerns regarding mobilisation of material from the former landfill site.

This report is an update of the April 2020 and April 2021 reviews which consolidated the knowledge of the site in Spring 2020 and incorporates data from two additional borehole piezometers installed on the former landfill site as requested by the Environment Agency as well as from a continuation of the holistic monitoring programme to this point in time.

This report has been prepared to present the results of a continued monitoring programme in the context of the proposed quarry's hydrogeological relationship to the closed landfill. It is intended to act as a technical addendum to the hydrogeology assessment report prepared as part of the planning application and Environmental Statement.

1.2 Site Setting and History

The site is located within rolling countryside approximately 700m to the south of the villages of Parsonby and Plumbland and 3.5km to the south of Aspatria at High Close Farm, CA7 2HF and National Grid Reference (NGR) NY 14516 38103 (Figure 1). It is on the north-facing slope of the side of the River Ellen valley and sone 2.2km south of the river.

The site area was originally granted permission as a limestone quarry in 1954. Cumbria Council subsequently listed the site as a "dormant quarry" in January 1996, with an expiry date of February 2042. To date only part of the original permitted area has been quarried and this area has been restored by landfilling by the County Council between 1975 and 1990. There are other quarries in the general vicinity of the site, including the Moota Limestone Quarry approximately 1.5km to the south of High Close Farm.

Following closure of the County Council landfill site, gas monitoring has taken place more or less continuously, in recent times by Cumbria Waste Management. Surface water monitoring took place from a single point located to the south of Plumbland and ceased in 2007 when no traces of the leachate were found. There has been no monitoring of groundwater by Cumbria County Council or by Cumbria Waste Management.

The proposed quarry area is located to the southwest of High Close Farm, between the closed landfill and the B5301 on the northerly facing slopes of Moota Hill above Flatts Beck. The topography falls from some 200mAOD at the top of the slope to approximately 160mAOD at the south of the landfill and proposed quarry area to approximately 140mAOD at the north of the proposed quarry. The topography continues to fall to approximately 90mAOD at Flatt Beck, a tributary to the River Ellen at the bottom of the valley to the north of the site.

[2] reproduced as Appendix A

The current scheme has been in development since 2001. An initial modern geological appraisal was undertaken in 2011, followed by a further appraisal in late 2016 to early 2017, which culminated in the installation of a series of landfill and groundwater monitoring points.

The proposed quarry is only intended to be worked to the west and southwest of the landfill, with the remaining area to the south and east of the landfill utilised for site infrastructure and mineral processing (Figure 2). The quarry will be worked from north to south in two sections, separated by an existing gas pipeline route which follows an east-west course immediately to the south of the landfill. The quarry will be an above groundwater excavation which will largely be restored to a mixture of grazing grassland, bare limestone, calcareous grassland and scrub.

Figure 1 Site Location

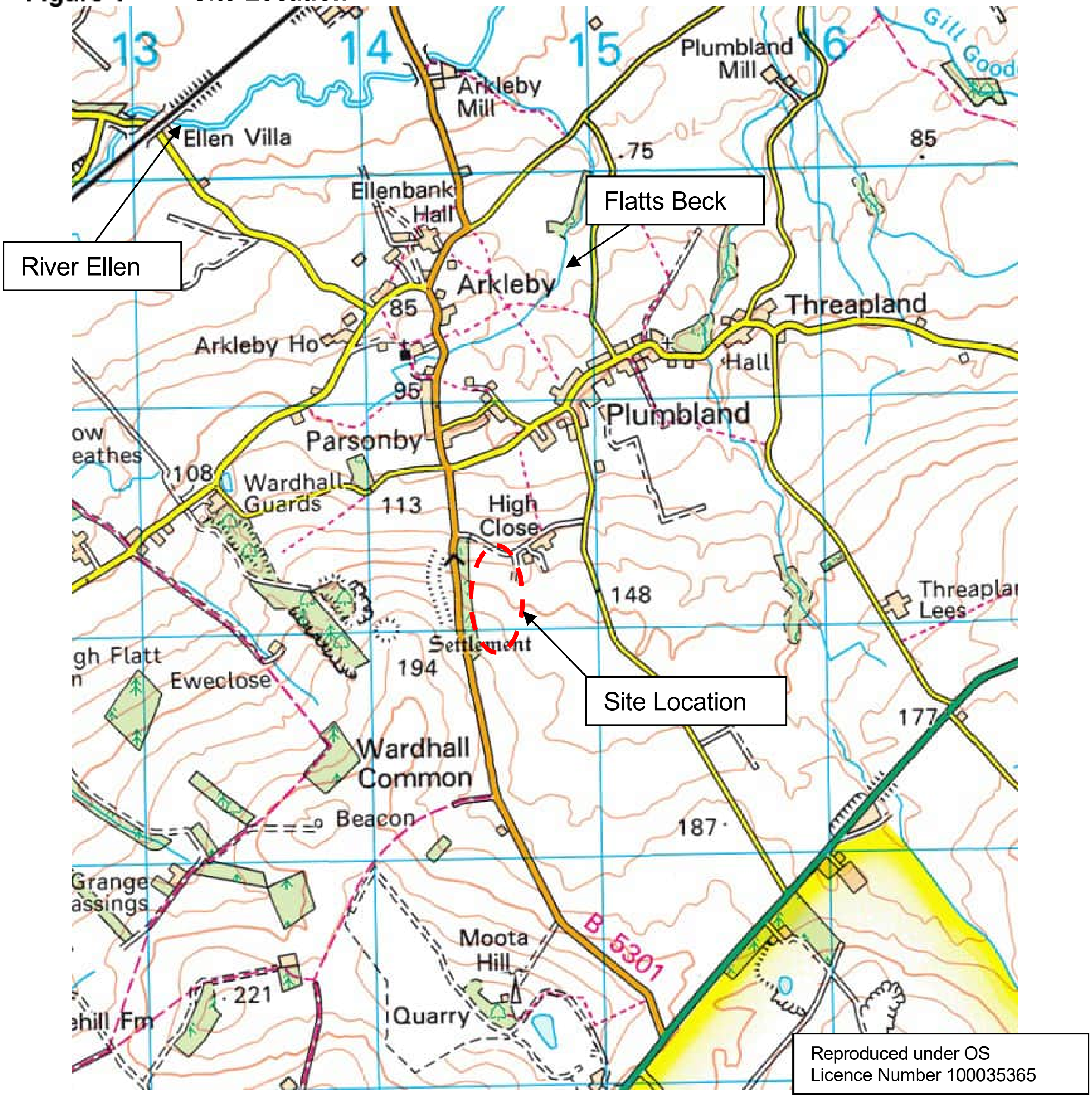
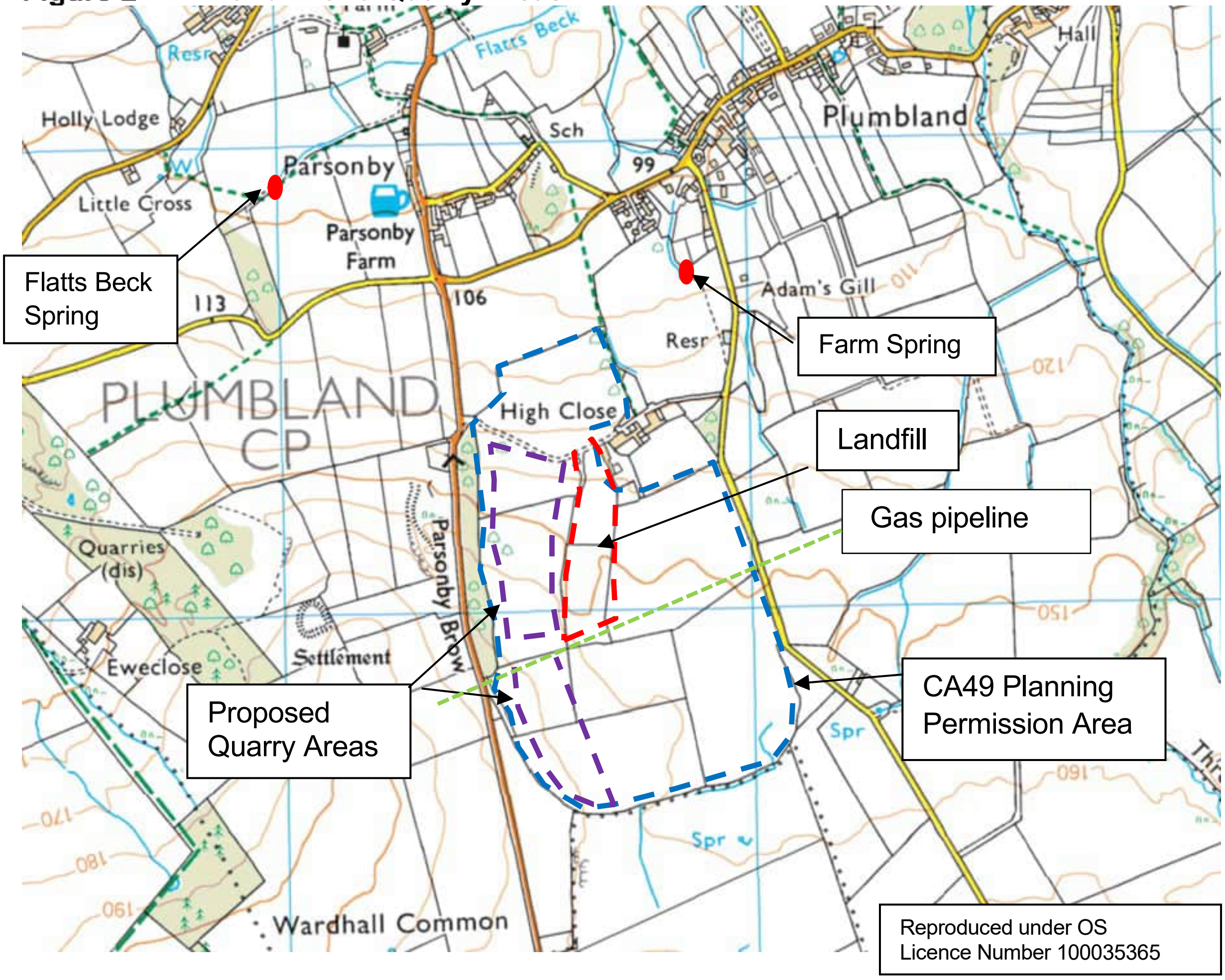
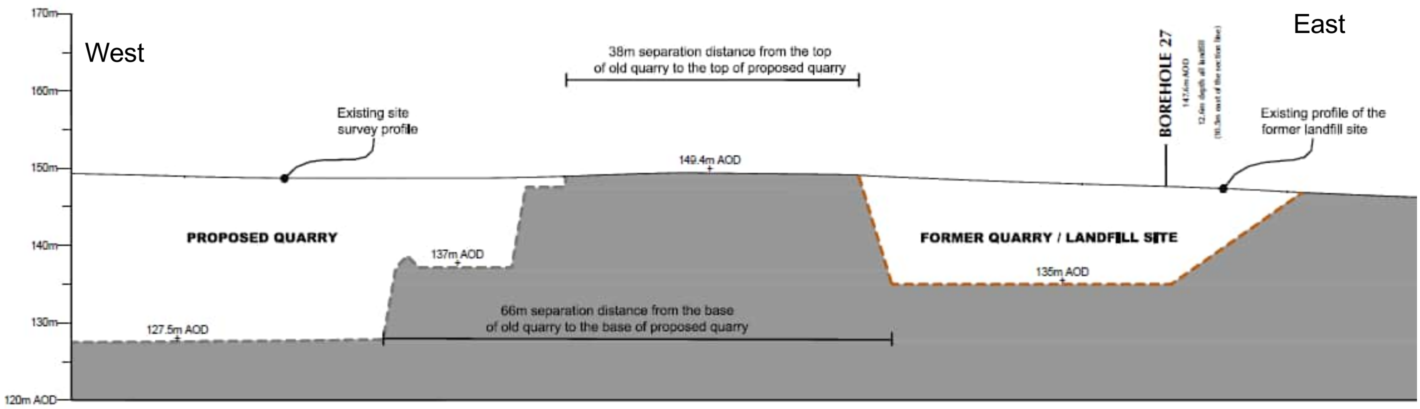


Figure 2 Landfill and Quarry Areas



The proposed quarry is physically separated from the landfill by between 29m and 40m at the crest of the landfill, however, this distance increases to a separation of between 63m and 90m at the base of the proposed quarry as illustrated in Figure 3. Full details of the separation distance and proximity between the landfill and the proposed quarry are presented in the appended Stephenson Halliday Drawings 2934\1 – 3.

Figure 3 Landfill Inter-relationship with Proposed Quarry



Extract from Stephenson Halliday Figure 3 Section B-B West to East Section through proposed High Close Landfill and Proposed Quarry, reproduced at full size in appended drawings

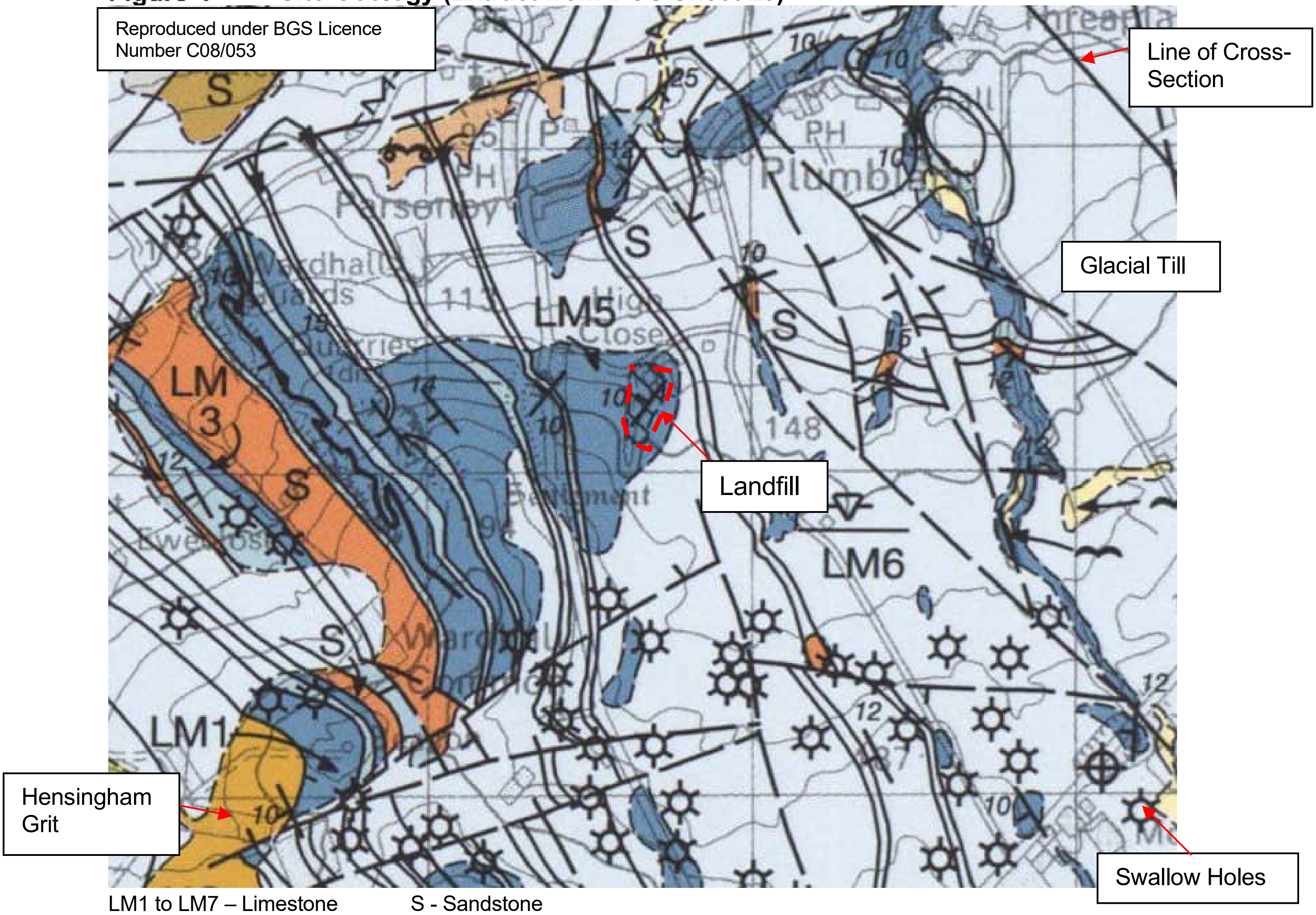
2. SITE GEOLOGY AND HYDROGEOLOGY

British Geological Survey (BGS) Map Sheet 23 (Figure 4 and Figure 5) identifies that the site is located within an area of superficial Glacial Till overlying a bedrock sequence comprising the Hensingham Group (HGP), which overlies the Chief Limestone Group (CLG). The CLG is in turn underlain by the basalts of the Cockermouth Lavas (CKML). The BGS map shows the till is thin or in parts absent in the footprint of the proposed quarry area and the limestone bedrock outcrops at surface. Specifically the outcropping limestone is the Fifth Limestone (LM5) unit of the Chief Limestone Group (CLG) a series of grey limestones separated by mudstones and sandstones with rare thin coals.

The specific sequence within the planning permission area is presented on the Stephenson Halliday Environmental Statement Drawing Figure 2: **2011, 2017 & 2021 Borehole Locations & Logs** *(Boreholes 1A / 3A / 5A / 7A / 15A / 22A / 25 / 26 Undertaken in 2017 Boreholes 28 & 29 Undertaken in 2021)* which indicate a largely continuous limestone sequence with localised thinner bands of mudstones and sandstone.

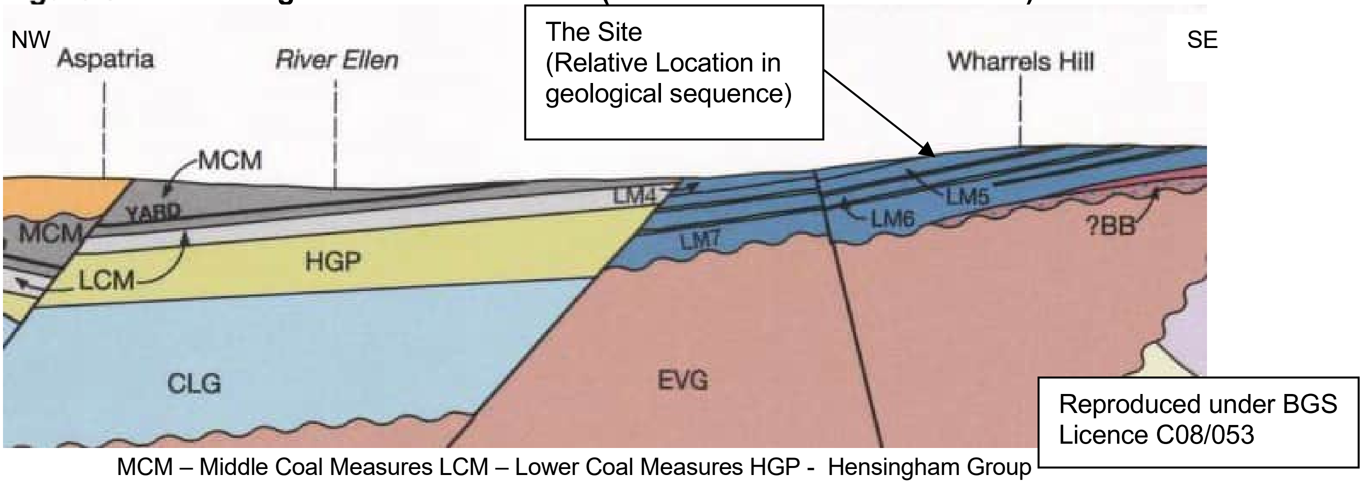
In 2017 a further seven boreholes, with inserted piezometers, were excavated on the site following advice from Rick Brassington, in order to obtain further information on groundwater conditions. Two further in-waste points with piezometers (28A & 29A) were installed in 2021. Groundwater monitoring for the locations shown on Figure 6 demonstrates that groundwater flow is to the north and the spring line above Flatts Beck.

Figure 4 Site Geology (Extract from BGS Sheet 23)



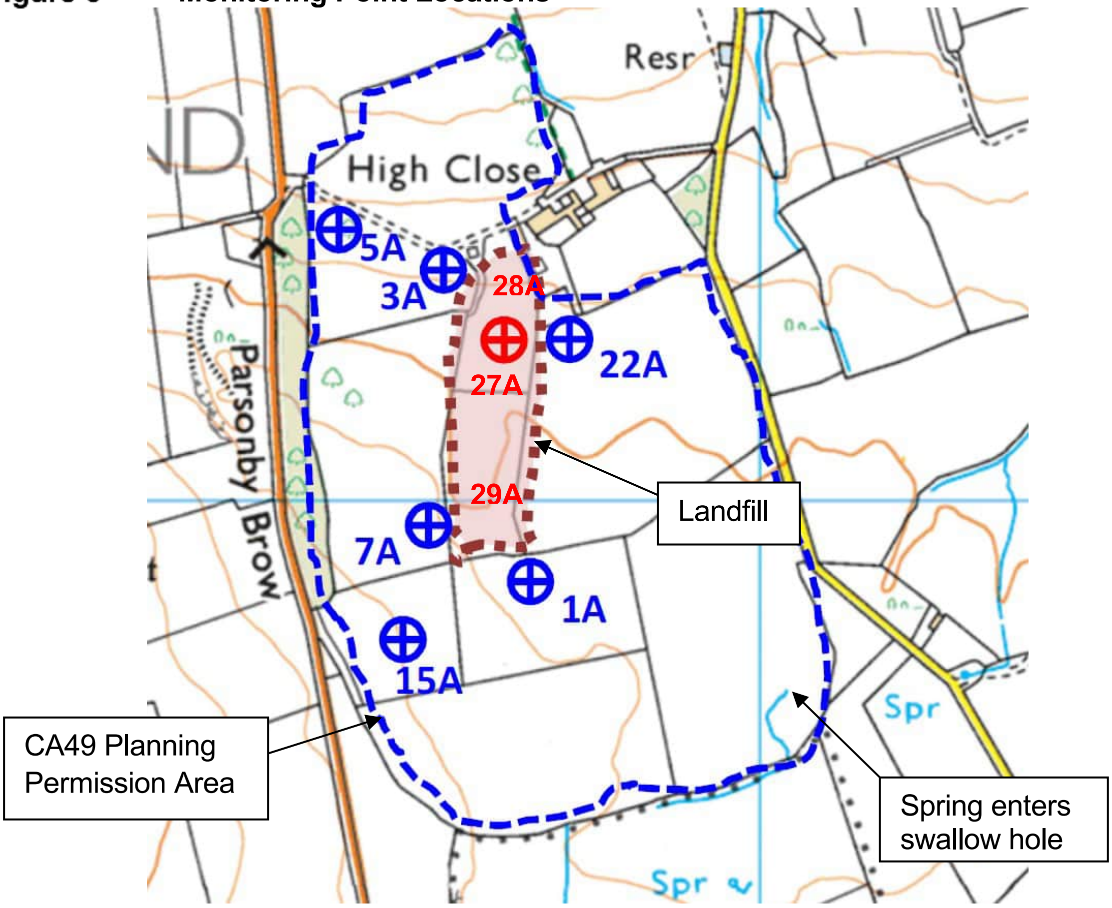
LM1 to LM7 – Limestone S - Sandstone

Figure 5 Geological Section NW to SE (offset 1.5km to East of the site)



MCM – Middle Coal Measures LCM – Lower Coal Measures HGP - Hensingham Group
GLG – Chief Limestone Group: comprising
LM1 (Youngest) to LM7 (oldest) of the First to Seventh Limestone, with interbedded mudstone and sandstone)
CKML – Cockermouth Lavas (Basalt) BB - Basal Beds (Conglomerate and sandstone)
EVG – Eycott Volcanic Group

Figure 6 Monitoring Point Locations



1A – 22A Environmental monitoring points 27A, 28A & 29A – Landfill monitoring point

Groundwater is typically greater than 30m below ground level at the south of the site and 10 – 16m below ground level to the north of the site. This reduction to depth to water is associated with a reduction in groundwater elevation consistent with the fall in topography towards the spring line at Flatts Beck and Farm Spring (Figure 2, Figure 7 and Figure 8).

The hydrogeological system is however more complex in the wider area, as springs are apparent on topographical maps to the south and east of the site.

The most likely cause of these springs and gills is a combination of local topographical features as well as the inter-relationship of outcropping mudstone units and swallow holes. For example, the spring to the south of the planning permission area discharges into a swallow hole at the southeast corner of the permission area (Figure 6).

Groundwater flow is therefore expected to be initially vertical through an unsaturated zone fissure network within the limestone, followed by lateral flow under a northerly hydraulic gradient towards the north until the water surface intersects with the fall in topography. There may also be a limited component of granular flow through the sandstone units, although as these are cemented this flow will also be via a fissure flow, with localised impermeable units. However, unless intersecting the ground surface, this flow component is expected to re-enter the limestone fissure flow network.

Figure 7 Groundwater and Landfill Leachate Elevation

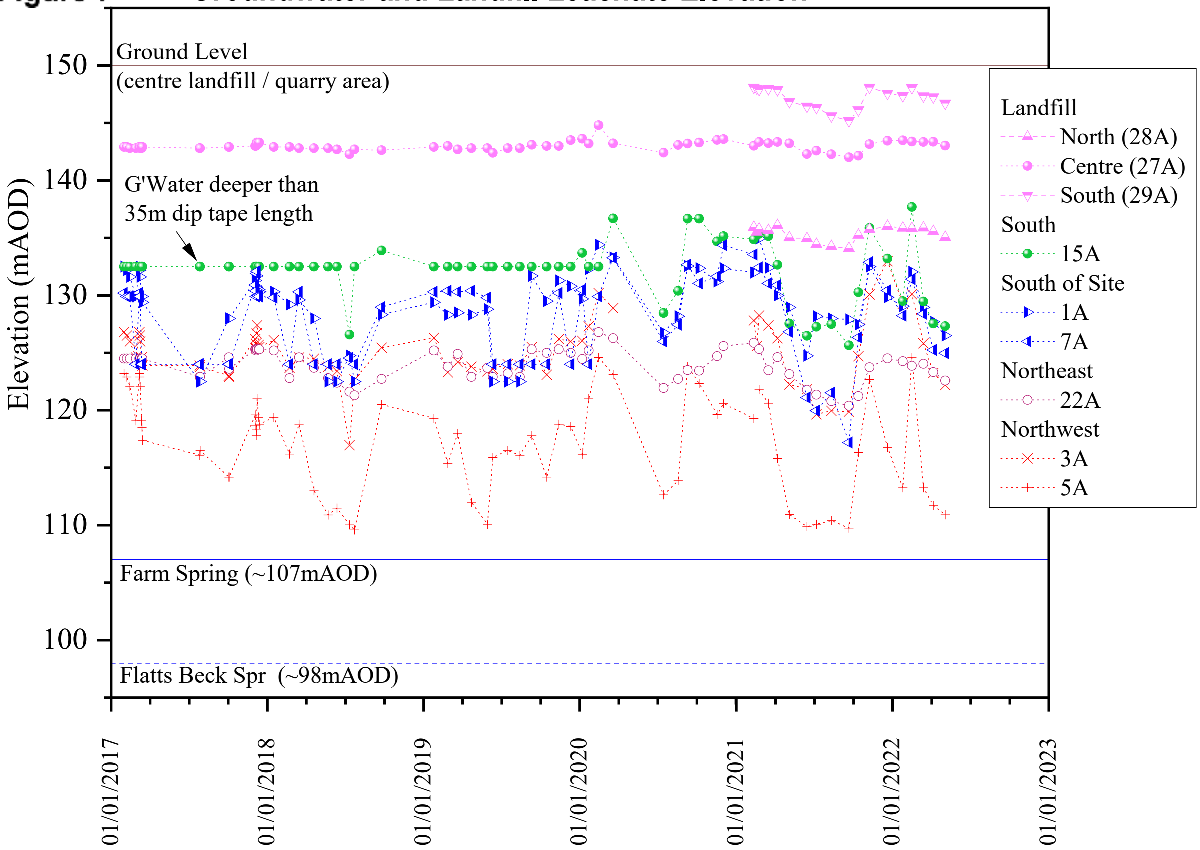
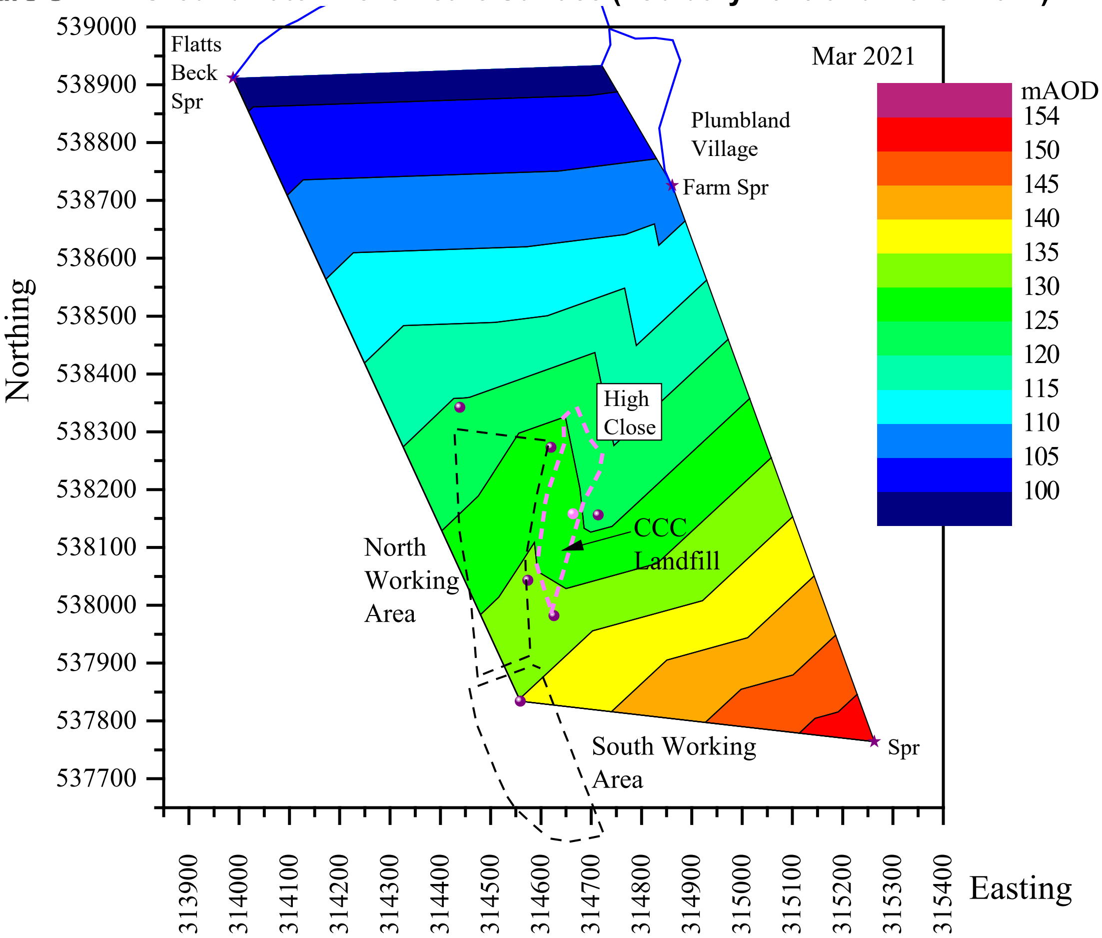


Figure 8 Groundwater Piezometric Surface (February 2020 and March 2021)



There are three monitoring points within the landfill, BH27A the original monitoring point has been supplemented with BH28A in the north of the site and BH29A in the south of the site.

Table 1 In-waste Monitoring Point Summary (March 2021)

Location	BH28A	BH27A	BH29A
	mAOD	mAOD	mAOD
Ground Level	141	147.5	154.5
Leachate Level	136	143.3	148.5
Base of Well	133.5	135.2	138.5
Base of Site	131.6	135	138
	mbgl	mbgl	mbgl
Depth to Water	5.1	4.2	6.0
Depth to Base	7.5	12.3	16.0
	m	m	m
Leachate Head	5	8	10

A hydraulic head has accumulated within the landfill at 4 - 6m below the ground surface which equates to a height 15m above groundwater in the south of the site (at 133-134mAOD), and 7m above groundwater in the north (at 138mAOD).

The leachate height acting on the base is therefore proportional to the thickness of waste placed, and equates to 5m at the lowest point in the site in then north increasing to ~10m in the south where the waste thickness increases in proportion to the land surface. This is an expected observation for a landfill of this age and type and is due to a combination of the moisture holding capacity of the placed wastes releasing moisture into the new conduit formed by the monitoring well. There is limited seasonal variability to the leachate head, and the site is considered to be in a hydraulic equilibrium between surface ingress/recharge, seepage through the base of the site, and a moisture content held within the waste mass. This is expected given the nature of the waste types deposited and operational design of the site.

3. WATER QUALITY

3.1 Introduction

The High Close Landfill site operated as a pre-Landfill Directive Municipal Solid Waste (MSW) landfill Therefore, it primarily accepted household waste under the County's waste management arrangements, along with a smaller proportion of commercial and industrial wastes. The site was essentially completed and closed in 1990 approximately 10 years prior to 2001, when Site Conditioning plans required that to continue to operate a Landfill Directive compliant basal and sidewall containment liner/barrier was required.

However, the operating philosophy for the landfill was as a "dilute and disperse landfill", in which the leachate generated due to rainfall infiltrating through the waste mass is allowed, and intended to seep through the base of the site before mixing with groundwater.

The site is also located within one of the highest rainfall areas of the country and therefore readily soluble leachate constituents are largely expected to have been flushed from the waste mass. However, as a domestic waste landfill, the leachate chemistry is expected to be defined by the biological system within the landfill in which degradable organic matter would initially be hydrolysed into soluble substances (organic acids, alcohols, phenolics, ketones and aldehydes) as a Biological Oxygen Demand (BOD) rich "acetogenic" plume, followed by the *in-situ* conversion of these hydrolysed degradable (BOD-rich) products to landfill gas (*i.e*. methane and carbon dioxide). These second stage methanogenic conditions then dominate the landfill regime and the associated leachate chemistry, which is dominated by recalcitrant (*i.e*. non-degradable) humic and fulvic type organic matter with ammonium, the nitrogen by-product of organic matter degradation.

The "primary polluting" phase of a dilute and disperse landfill site is therefore the early stages of the site's lifecycle when putrescible materials are being deposited. At this lifecycle stage an organic rich liquor is readily released to groundwater, which can then cause severe eutrophication upon entering surface waters. The perceived "hazardous" nature of this liquor is therefore related to the oxygen depletion that could be caused in combination with the ammonium content and is not related to substances classified as hazardous under the Groundwater Directive or Water Framework Directive.

For a landfill leachate in the order of 20 – 30years old, the leachate strength is expected to be proportional to the rate that landfill gas is generated, and therefore would have peaked several decades ago and then continued to deplete over time.

These types of leachates are remarkably similar across the entirety of the UK and can be characterised as "brackish water strength" sodium bicarbonate-chloride solutions which contain significant ammonium and potassium with limited sulphate compared to terrestrial waters. Any residual organic matter is expected to be entirely recalcitrant at this stage of the site's lifecycle, whilst specific hazardous organic substances, or the hazardous metals mercury and lead are rarely present within the leachates from active landfill sites.

A leachate inventory containing hazardous substances is therefore not expected to be present, whilst there could be a residual component of salts and ammonium above Drinking Water Standards (DWS) or Environmental Quality Standards (EQS), in combination with a tertiary component of the common heavy metals found in landfill leachates, *i.e*. chromium, nickel and zinc.

3.2 Monitoring Data

Water quality monitoring has been undertaken at the two “seasonal extremes”, *i.e*. summer to autumn 2018 followed by winter to spring 2020 in response to requests for further sampling from the Environment Agency. A routine monitoring programme incorporating monthly sampling was implemented from summer 2020 which has continued to the time of the preparation of this document (July 2022).

All the water sampling has been undertaken independently by Cumbria Waste Management Ltd with the chemical analyses carried out by UKAS Accredited laboratories.

Although not requested, it was considered, as part of the overall assessment of the water environment, that it would be helpful to obtain surface water samples for chemical analyses. Surface water samples were taken from Flatts Beck Spring and Farm Spring the spring lines below the landfill during 2020. The January 2020, June 2020, February 2021 and May 2022 sampling exercises also included an extended hazardous screen.

These water sampling periods are appropriate as groundwater elevations typically peak towards the end of March, and then decline as effective rainfall rates fall in response to spring-summer temperatures until groundwater is at its lowest in September, with the primary recharge period occurring over the later winter months as moisture deficits are consumed.

The analysis schedule reported in the previous hydrogeological assessments was extended to include a full metals and periodic organic screens over the data collection period

The primary defining landfill influences which characterise the groundwater are the overall increase in ionic strength within an elevated bicarbonate solution matrix along with chloride, potassium, magnesium, ammoniacal-N and chloride (Figure 9). The groundwater outside of this landfill type influence is a calcium bicarbonate solution, containing low sodium, chloride, potassium and ammoniacal-N (Table 2).

The most readily distinguishable marker compounds which can be used to distinguish the leachate or a leachate influence from the groundwater system are therefore ammoniacal-N, potassium and chloride (Figure 10 - Figure 12). It is this analysis which has been extended into the continued monitoring programme to determine where there has been a landfill influence within the groundwater and at the spring lines.

Table 2 Major Element and Leachate Indicator Substances Average Concentration (2018 – May 2022)

	Landfill			Adjacent (West)		Downgradient			Upgradient		Adjacent (East)
	BH27	BH28	BH29	7A	3A	5A	Flatts Beck	Farm Spring	15A	1A	22A
	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
pH (as pH units)	7.0	7.0	7.2	7.1	7.2	7.4	7.7	7.7	7.5	7.6	7.7
Ammoniacal-N	73	94	155	22	57	0.13	0.22	0.08	0.11	0.05	0.08
Calcium	206	188	191	193	139	133	120	107	126	117	80
Magnesium	44	35	40	19	32	8	6	3	8	6	13
Sodium	94	81	188	53	112	8	15	8	6	13	9
Potassium	104	74	122	29	70	3	3	3	2	2	2
Chloride	88	84	226	71	148	10	24	6	9	14	10
Sulphate	6	3	13	19	7	9	18	11	12	10	13
Alkalinity	1644	1033	1383	634	1030	338	259	250	319	289	264
	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
Arsenic	3	2	3	<1	2	<1	<1	<1	<1	<1	<1
Chromium	2	2	2	<1	<1	<1	<1	<1	<1	<1	<1
Nickel	11	7	10	14	19	2	2	2	5	2	2

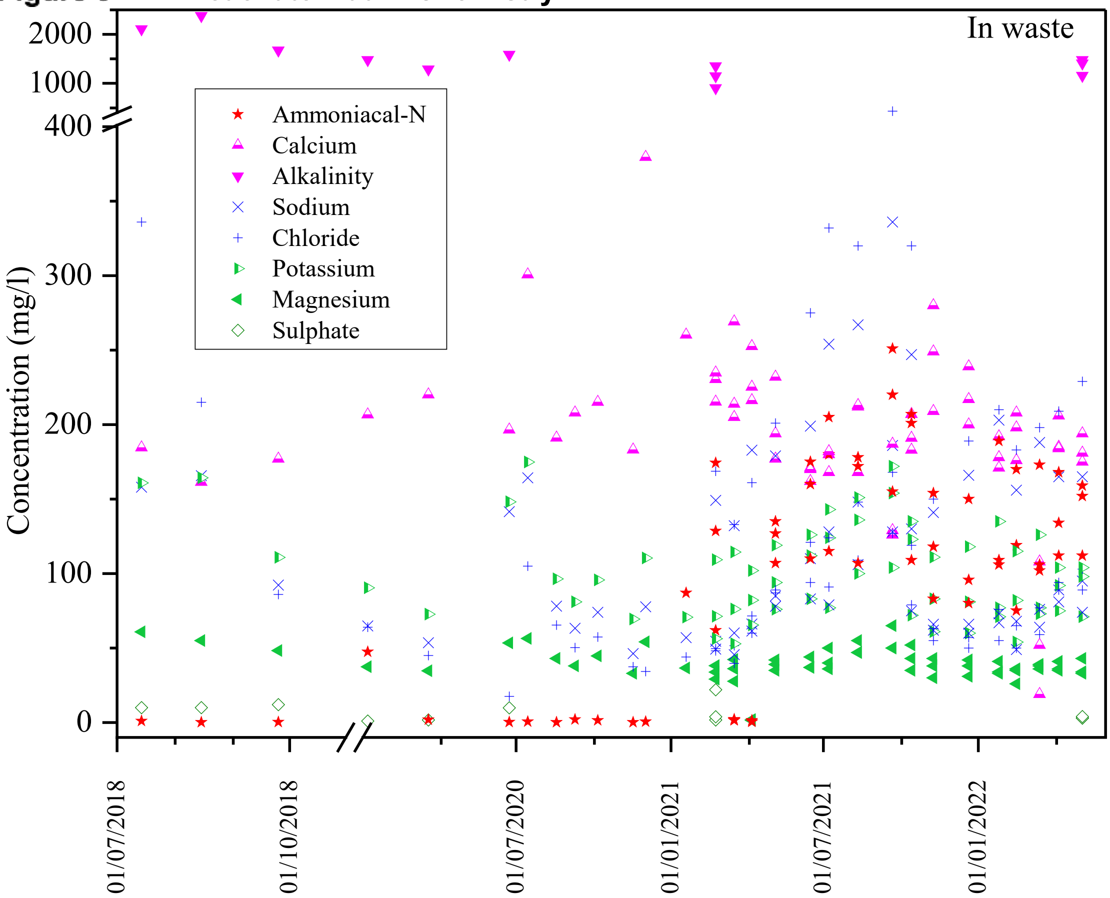
yellow shaded cells elevated compared to background geochemical system
green shaded cells – primary leachate marker compounds

Bicarbonate (*i.e.* alkalinity) is not as useful an indicator as the other ions mentioned, as carbon dioxide is expected to be rapidly volatilised outside of the landfill and therefore it is a less suitable marker. Both leachate and groundwater are of a neutral to slightly alkaline pH (pH6.8 to 8.2) and consistent therefore this parameter is of limited use in determining the landfill's influence.

The use of these marker compounds in the context of the holistic solution matrix chemistry and water elevation can be used to identify three "geochemical" regimes from the monitoring programme, namely:

1) an upgradient regime at BH01A and BH15A to the south of the site along with BH22A to the east of the site;
2) a landfill influenced regime at BH27A, BH28A and BH29A within the landfill and the two monitoring points on the western perimeter (BH07A and BH03A) which are receiving the vertical flow from the landfill before mixing fully with groundwater;
3) a downgradient regime / outside of the sphere of influence at BH5A and the two springs to the north of the site. BH22A could also be considered as part of this regime, and is noticeably the least influenced location, and is consistent with the upgradient locations.

Figure 9 Leachate Matrix Chemistry



The High Close landfill was designed and operated following the practices of the time as a dilute and dispersion landfill, *i.e.* it was expected that all leachate generated within the landfill would enter the groundwater system. This would then mix with groundwater, become diluted and then disperse downgradient of the site. For a relatively small site the size of High Close, the landfill influence on groundwater would peak between midway and the end of the operational lifecycle, before progressively depleting.

Monitoring has demonstrated that the site's landfill leachate has depleted to between 1% and 5% of that expected for a MSW leachate during the final stages of the site's operation and initial period of aftercare. This impact even during the peak generation period as no specific remedial methods were required to manage the leachate influence at off-site receptors, namely the spring lines feeding Flatts Beck and tributary streams in the river valley to the north of the site.

The primary concern raised by the Environment Agency is whether the residual pollution potential presented by the landfill could enter the quarry, thereby short-circuiting the normal migration route to groundwater and being classified as a direct discharge from the quarry to groundwater. There is also concern that the quarrying could induce the release of the absorbed water held within the landfill, thereby releasing substances not already being released to groundwater.

The significance of the ongoing and potential future release is informed by the quantity and distribution of hazardous and non-hazardous substances within the landfill that could cause harm. The landfill however is small in size (<1.5ha) and depth (typically 12 - 13m), hence the nature of the fluctuation in leachate ammoniacal-N which is frequently reported as being <2mg/l and on the majority of occasions groundwater ammoniacal-N (Figure 9) is classifiable as a

"Good" water quality, (*i.e.* ≤0.6mg/l), whilst chloride (Figure 10) in both leachate and groundwater is also of a "Good water quality (*i.e.* <250mg/l). This can only reduce in future as the source continued to deplete.

Figure 10 Leachate, Groundwater and Surface Water Ammoniacal-N

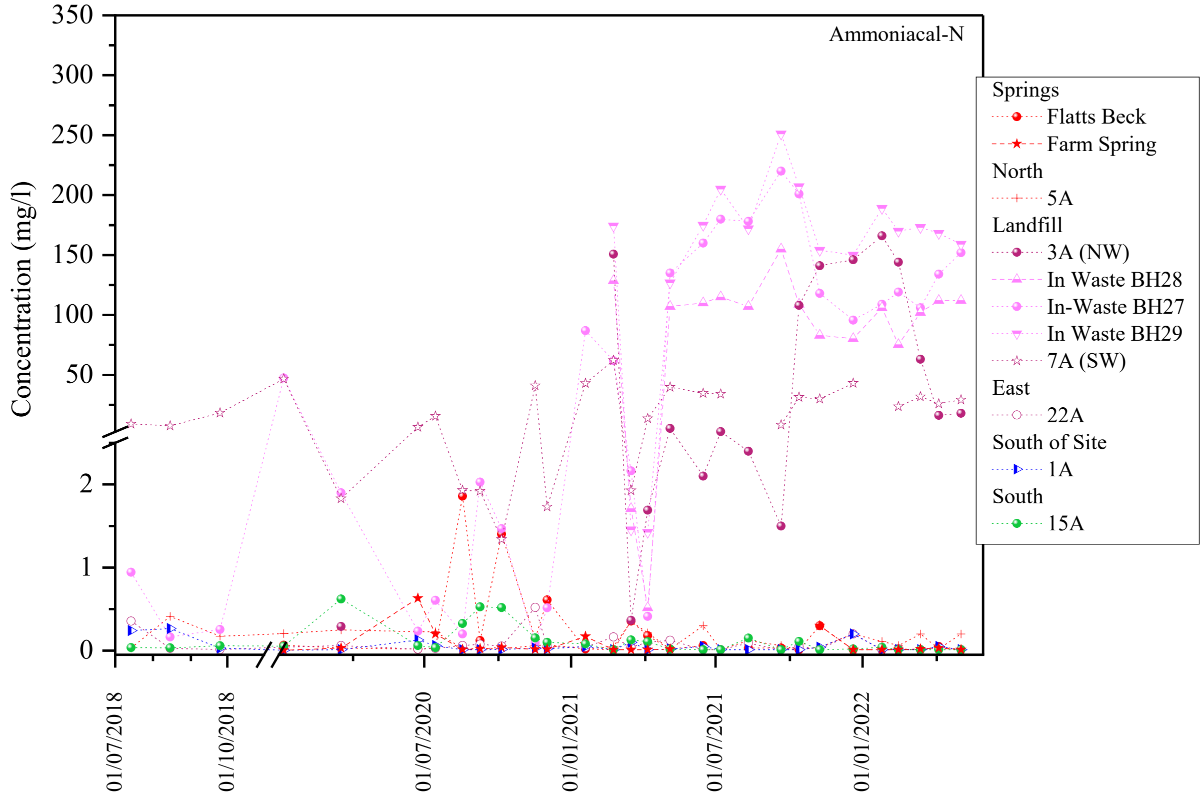


Figure 11 Leachate, Groundwater and Surface Water Chloride

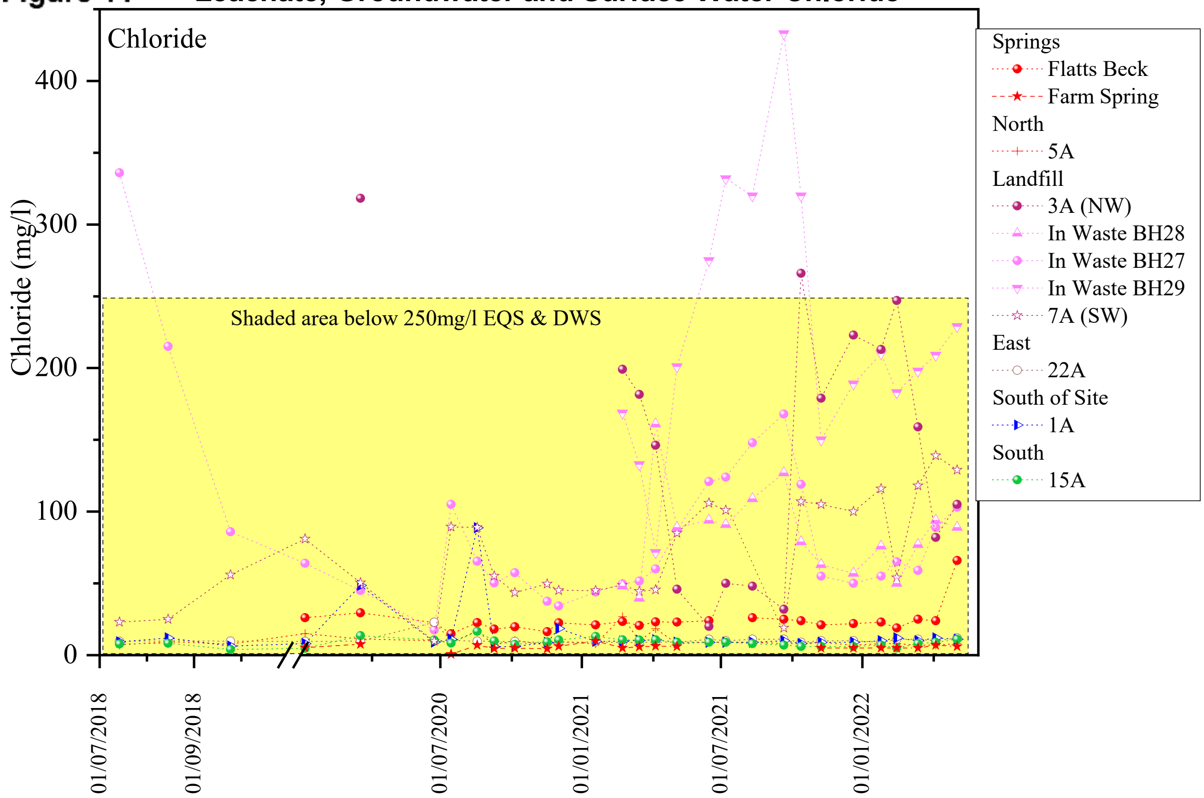
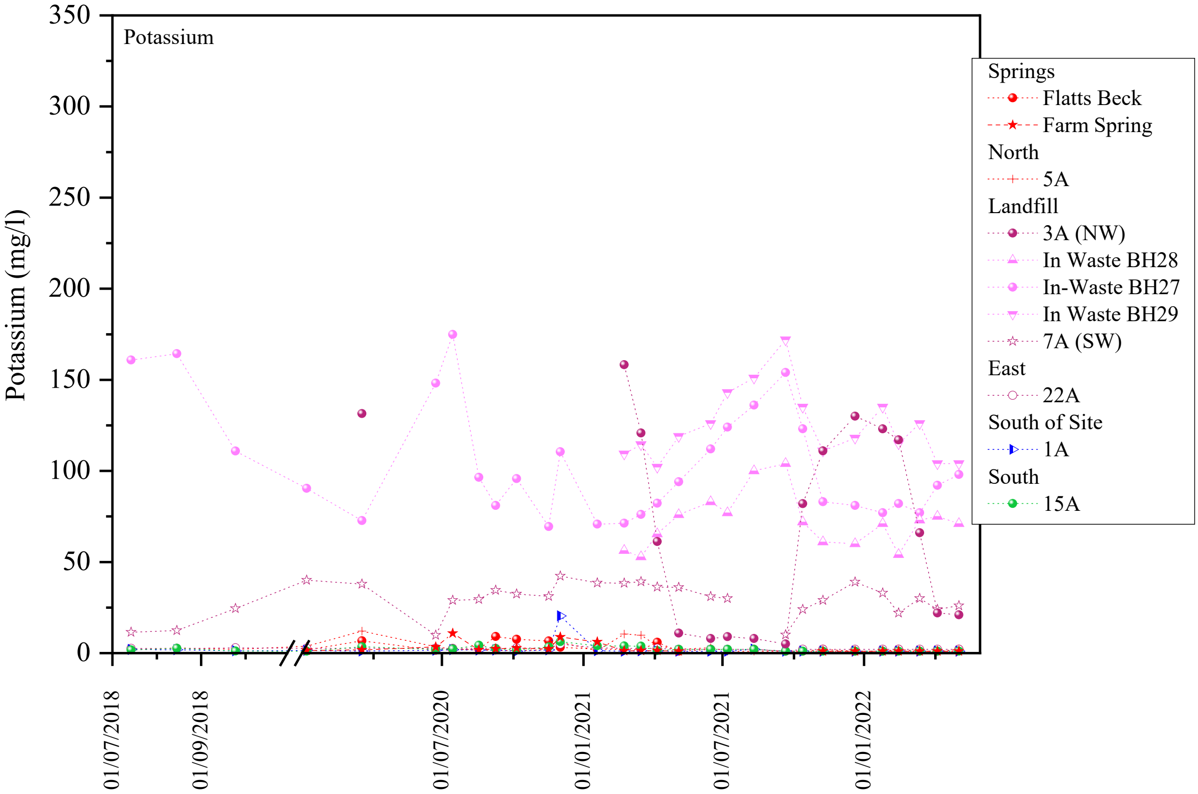


Figure 12 Leachate, Groundwater and Surface Water Potassium



Leachate chloride is below both its EQS and DWS in the leachate and therefore there is insufficient present to cause harm to either the leachate or the off-site water system. Notwithstanding this, a localised influence at the immediate edge of the site is apparent in BH3A and BH7A. The consistency of these measurements with that of the leachate does demonstrate that the site is operating as intended as a Dilute & Dispersion landfill, however, BH3A and BH7A are monitoring water quality prior to the dilution and dispersion process. This is expected for a site of this type, whereby water flow is through preferential (fissure) pathways in the limestone, and the pattern observed for chloride is replicated by potassium (Figure 12), the third leachate indicator. Although a potential leachate indicator, water quality standards for potassium were withdrawn by 2009 and currently remain withdrawn in the 2016 Regulations[3]. Notwithstanding this potassium is below the 200mg/l limit for the closest analogue substance, sodium, and therefore potassium is of no environmental significance at High Close. This leachate influence is not apparent in BH22A on the east of the landfill, an observation consistent with the higher clay content of the eastern flanks of the landfill.

Ammoniacal-N is a primary soluble breakdown product from organic matter and a principal leachate constituent of concern. At High Close, the ammoniacal-N has depleted to less than 10% of that expected in a leachate and has reduced to a concentration that is readily diluted and dispersed after groundwater mixing. However, unlikely potassium and chloride, which are non-degradable inorganic substances, ammoniacal-N is a biodegradation intermediate breakdown product between organic nitrogen and nitrogen gas. The original source of the ammoniacal-N is the organic content of the wastes, however, monitoring data demonstrates that the dissolved organic content, as represented by the Chemical Oxygen Demand (COD) of the

[3] The Water Supply (Water Quality) Regulations 2016. SI 2016 No. 614

water is low and demonstrative of little to negligible remaining biodegradable matter available (Table 3).

In fact one of the highest COD recorded at the site is for the "most upgradient" location, BH15A, whilst a COD influence at BH5A to the northwest of the proposed quarry area has also historically contained elevated COD, but no other leachate indicators. Consequently it is impossible to definitively distinguish a landfill leachate influence on groundwater quality from the leachate organic content, as background fluctuations are of a similar concentration range as observed in the leachate. This in itself is not surprising, as COD is an expected constituent of upland waters, and is readily derived from sources such as peat.

Table 3 High Close Waters Organic Content (COD)

Location	BH	Mar-20	Jun-20	Feb-21
Landfill	27A	299	130	59
	28A			58
	29A			94
Western Perimeter	7A	35	24	27
	3A	119		88
Eastern Perimeter	22A		23	<10
Upgradient (South)	15A		240	<10
	1A		19	<10
Offsite - Northwest	5A	143	53	<10
Spring Line North	Flatts Beck		<10	<10
	Farm Spring		17	<10

This low landfill organic content is therefore demonstrative that biodegradation processes which produce ammonium have essentially ceased. This conclusion is supported by the cessation of landfill gas generation, the other biodegradation products, as well as the appearance of dissolved iron in the leachate. Under these conditions, ammonium will progressively be oxidised and by various processes be converted to nitrogen gas and will be lost from the system both within the landfill site as well as the wider environment as evidenced by the lack of ammoniacal-N in the downgradient monitoring points BH5A, Flatts Beck and Farm spring. There is therefore insufficient ammoniacal-N in the landfill to cause harm to either the proposed quarry or the downgradient water systems as natural processes will degrade and deplete the residual ammonium present.

Although the primary leachate indicator substances are demonstrative that the High Close landfill is not causing harm to the wider hydrogeological and hydrological systems either downgradient of the landfill or expected within the quarry, further consideration of persistent pollutants was requested, specifically to demonstrate that the conclusions drawn in the previous (April 2020) hydrogeological landfill assessment remained valid over a wider distribution within the landfill. This request was raised because of a general perception that landfills contain a large inventory of hazardous substances. However, this is not the case. It is appreciated that a landfill leachate in its un-depleted state could cause harm to receiving waters, however, this was almost entirely due to the undegraded organic content of fresh leachates and the associated ammonium content, neither of which have a significant off-site pollution potential at High Close Landfill. Notwithstanding this, additional data has been collected and is discussed below.

Hazardous Metals and Metalloids

Mercury and lead are not present in the leachate, groundwater or surface water, except for a single determination of lead at 3µg/l (BH7A) and a single determination of mercury at the upgradient BH15A at 0.019µg/l in June 2020 (Table 4). These were below the lead and mercury

Drinking Water Standard (DWS). The down-classified (to non-hazardous status) cadmium is only reported in the 2022 suite after the reduction in the detection limit from <0.07µg/l to <0.02µg/l, with the leachate cadmium at or below the <0.02µg/l detection limit. This is insignificant compared to the 5µg/l cadmium DWS.

Arsenic and chromium are in the <0.1 – 3µg/l range. Both are below their respective DWS and EQS. Neither has the potential to cause harm to groundwater or surface water.

Table 4 Leachate Groundwater and Surface Water Lead, Cadmium and Mercury

	Location	Date	Cadmium	Lead	Mercury
			µg/l	µg/l	µg/l
Upgradient (South)	15A	07/01/2020	<0.07	<0.2	<0.008
	15A	23/06/2020	<0.07	<0.2	0.019
	15A	23/02/2021	<0.07	<0.2	<0.008
	1A	07/01/2020	<0.07	<0.2	<0.008
	1A	23/06/2020	<0.07	<0.2	<0.008
	1A	23/02/2021	<0.07	<0.2	<0.008
Cross Gradient (East)	22A	07/01/2020	<0.07	<0.2	<0.008
	22A	23/06/2020	<0.07	<0.2	<0.008
	22A	23/02/2021	<0.07	<0.2	<0.008
Landfill (In-waste)	27A	07/01/2020	<0.07	<0.2	<0.008
	27A	19/03/2020	<0.07	<0.2	
	27A	23/06/2020	<0.07	<0.2	<0.008
	27A	23/02/2021	<0.07	<0.2	<0.008
	27A	04/05/2022	0.02	<1.0	<0.03
	28A	23/02/2021	<0.07	<0.2	<0.008
	28A	04/05/2022	<0.02	<1.0	<0.03
	29A	23/02/2021	<0.07	<0.2	<0.008
	29A	04/05/2022	0.02	<1.0	<0.03
Edge of Landfill (West)	7A	07/01/2020	<0.07	<0.2	<0.008
	7A	19/03/2020	<0.07	<0.2	
	7A	23/06/2020	<0.07	<0.2	<0.008
	7A	23/02/2021	<0.07	3.1	<0.008
	7A	04/05/2022	0.03	<1.0	<0.03
	3A	19/03/2020	<0.07	<0.2	
	3A	23/02/2021	<0.07	<0.2	<0.008
	3A	04/05/2022	0.07	<1.0	<0.03
Downgradient (North and Northwest)	5A	07/01/2020	<0.07	<0.2	<0.008
	5A	19/03/2020	<0.07	<0.2	
	5A	23/06/2020	<0.07	<0.2	<0.008
	5A	23/02/2021	<0.07	<0.2	<0.008
	5A	04/05/2022	0.03	<1.0	<0.03
	Farm Spring	07/01/2020	<0.07	<0.2	<0.008
	Farm Spring	23/06/2020	<0.07	<0.2	<0.008
	Farm Spring	23/02/2021	<0.07	<0.2	<0.008
	Flatts Beck	07/01/2020	<0.07	<0.2	<0.008
	Flatts Beck	23/06/2020	<0.07	<0.2	<0.008
	Flatts Beck	23/02/2021	<0.07	<0.2	<0.008

Figure 13 Leachate, Groundwater and Surface Water Arsenic

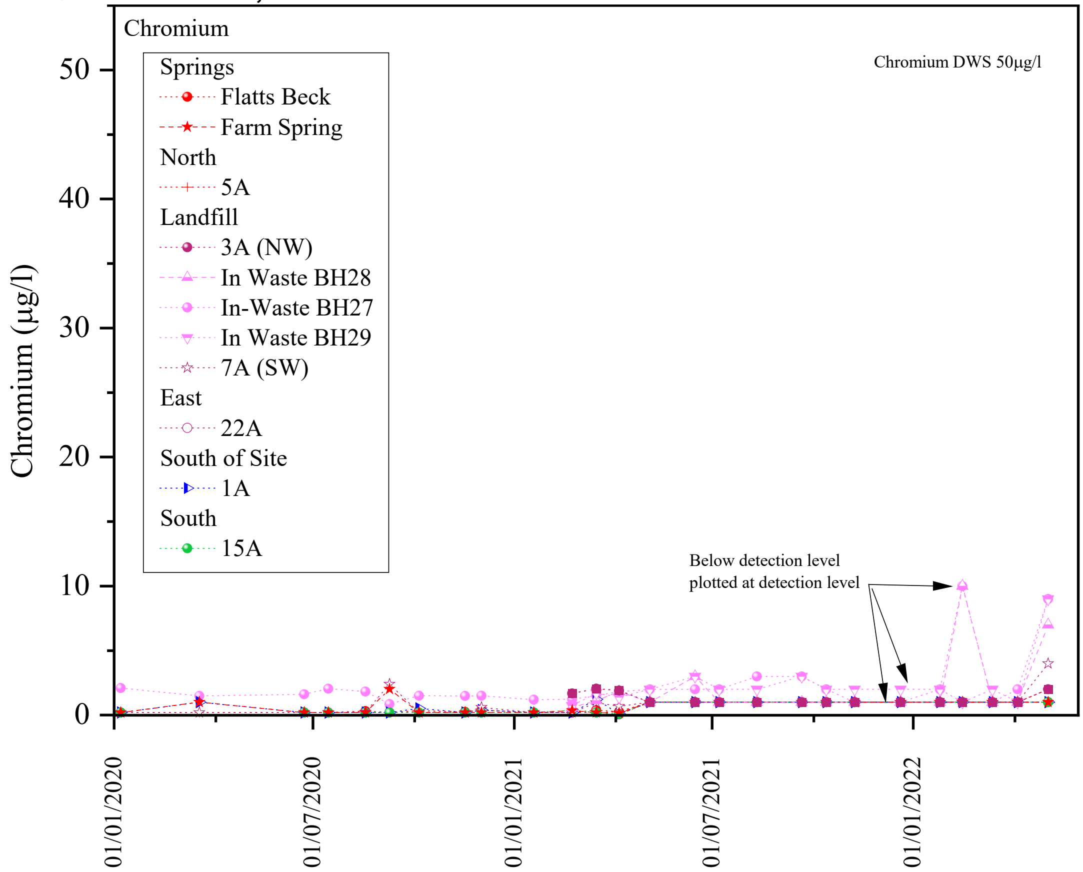
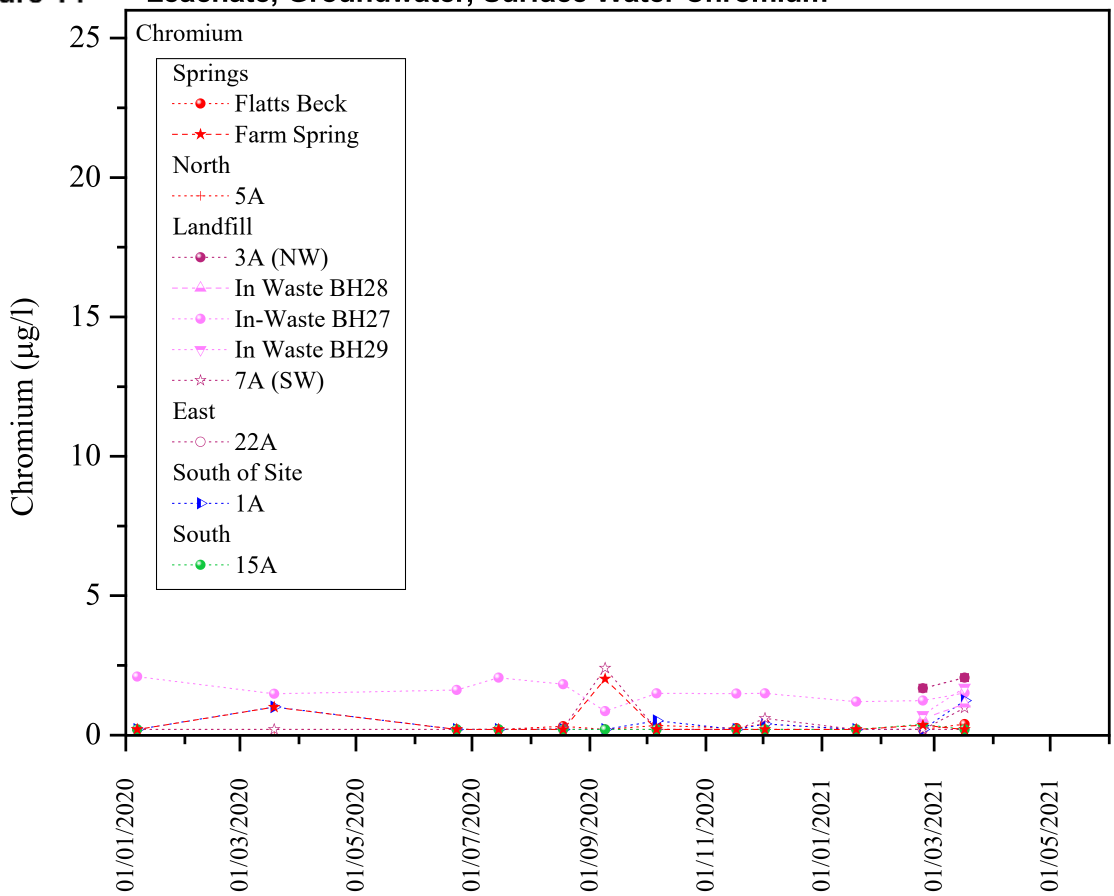


Figure 14 Leachate, Groundwater, Surface Water Chromium

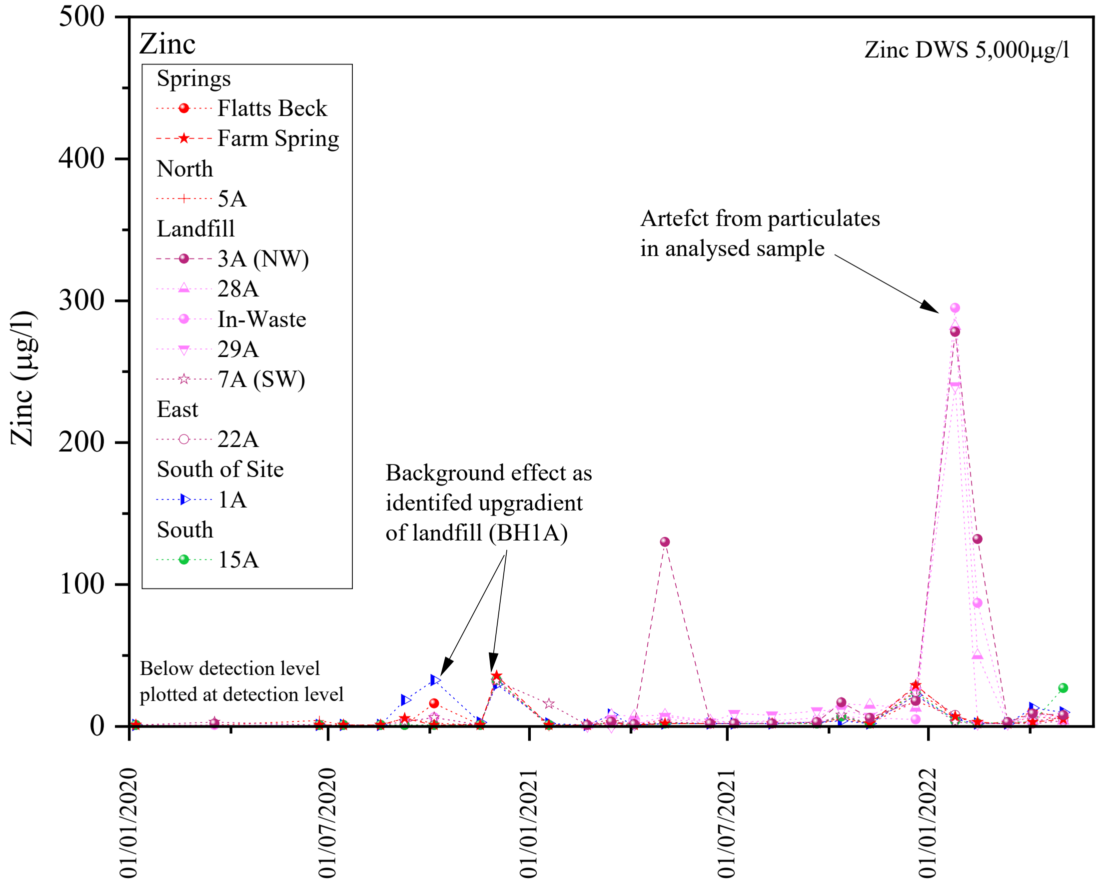


Non-hazardous Metals

Copper is at <0.4 – 4.5µg/l, *i.e.* a negligible concentration in leachate or groundwater.

Zinc is at <1µg/l, except on occasions where apparently elevated zinc (of up to 35µg/l) is reported across the entire monitoring schedule into a narrow zone. The most likely explanation is a laboratory dilution error. A similar effect can be observed in the copper (Figure 16) and nickel (Figure 17) dataset from the same sample set. Assuming a consistent dilution error, then on that occasion the zinc would be in the 1 – 4µg/l range at all monitoring locations. However, when this analytical irregularity period is excluded, peak zinc concentrations are all reported for the upgradient monitoring point BH1A, at the south of the site (Figure 15). The hydrogeological system is therefore not at risk from zinc contamination.

Figure 15 Leachate, Groundwater and Surface Water Zinc



Nickel is the only priority metal in the leachate which can be routinely distinguished above groundwater concentrations. However, on the majority of occasions nickel is reported below the DWS, whilst groundwater and surface water are almost continuously below both the DWS and EQS. Although an outlier period was observed for December 2020, at the same point in time as that observed for zinc and copper, the most significant reported nickel concentration was for the upgradient BH15A, located to the south of the landfill (Figure 17). Such an observation is demonstrative that the landfill's nickel content is not significantly different from the wider environment and is within the precision capabilities of modern sampling and analytical techniques. It is therefore considered not possible to cause pollution from nickel from High Close landfill.

Figure 16 Leachate, Groundwater and Surface Water Copper

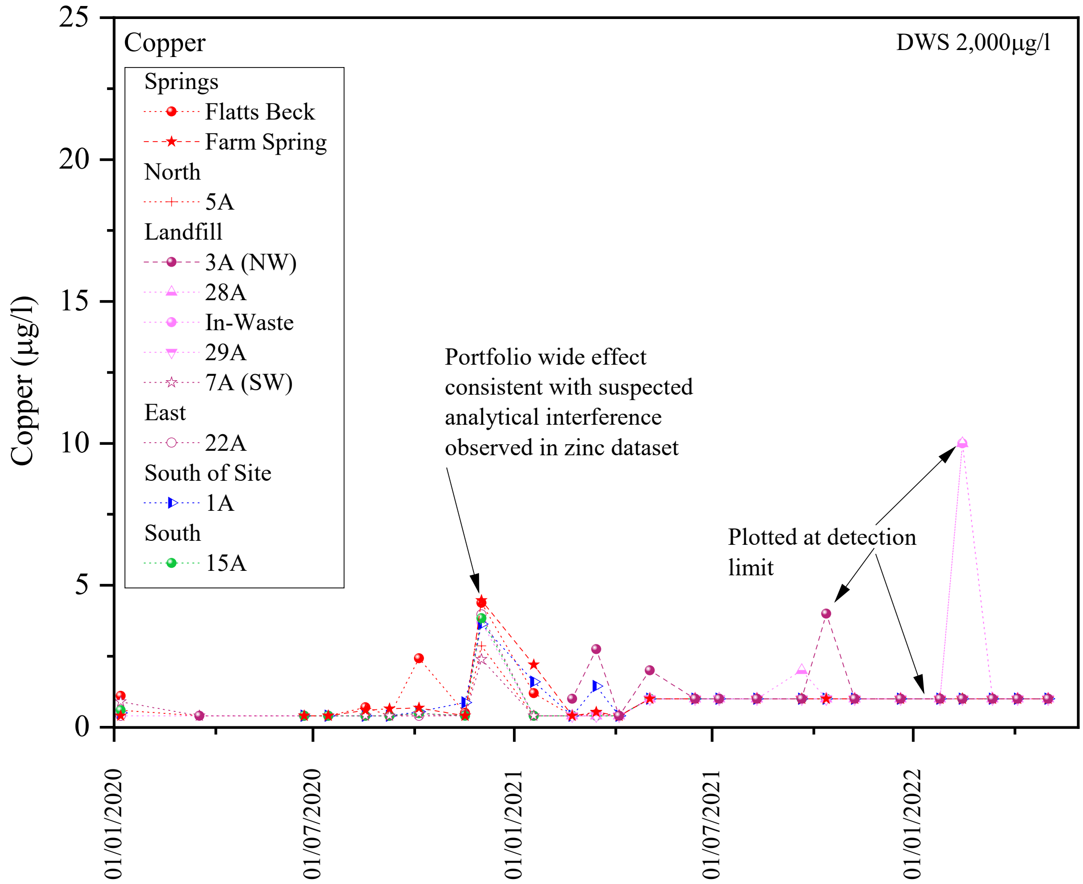
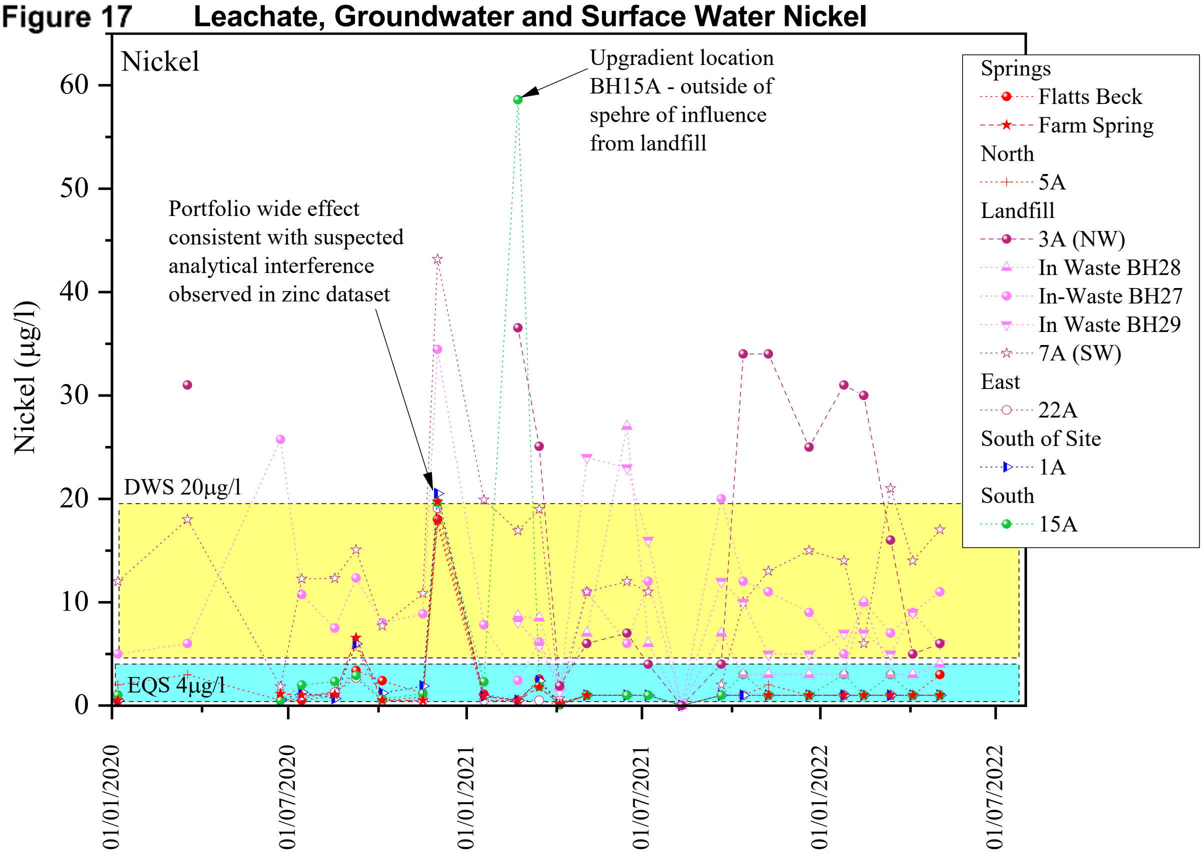


Figure 17 Leachate, Groundwater and Surface Water Nickel



Hazardous Organic Content

A full organic screen was undertaken for all accessible groundwater locations in January 2020. Further targeted screens undertaken in June 2020, February 2021 and May 2022.

A hazardous substances landfill leachate screen analytical framework[4] has been produced by the Environment Agency which has been designed as a schedule of Volatile Organic Compounds (VOC), Semi-volatile Organic Compounds (SVOC), derivatised SVOC (*i.e.* herbicides and pesticides), organo tin, mercury and cadmium. Within this framework key determinands have been identified as well as a requirement to report any other hazardous organic substances found above a reporting concentration of 10µg/l.

Since this framework was originally introduced in 2002 the list of hazardous substances has been modified, however, the framework is sufficiently flexible to capture the updated list of hazardous substances[5] identified following the UK's Water Framework Directive Technical Advisory Group's review[6].

Since the leachate hazardous substances framework was first introduced at the beginning of the landfill permitting process under the Pollution Prevention and Control (PPC) Regulations, there has been a considerable accumulation of knowledge on the nature of leachates. These suites undertaken at a regular (annual basis) on all UK landfill sites and when the information is consolidated together have demonstrated that hazardous substances are rare within landfill leachates. The only hazardous organic substances consistently present within leachates are by-products of landfill gas production, and comprise the BTEX (benzene, toluene, ethylbenzene and xylene) and similar substituted aromatic substances. As these are readily degradable and volatile, they form as transient biodegradation intermediates and are only present so long as there is active landfill gas formation. Furthermore, as they are formed as by-products of the landfill gas generation they are also rapidly depleted from the landfill as landfill gas rates wane. In the case of High Cross landfill, there is no longer any significant formation.

This pattern of a limited hazardous substance seen across UK wide landfills is also observable at High Close, whereby there is only two hazardous organic substances reported at or above the screening framework within the landfill, namely

- 12µg/l and 22µg/l Acenaphthene at BH28A in 2021 and 2022
- 12µg/l of 1,2,4-Trimethylbenzene at BH27A in January 2020

There have been no other significant occurrences of any BTEX and other PAH type substance the "group types" for both trimethylbenzene and acenaphthene within the site's leachate, all of which are at or below the BTEX Minimum Reporting Levels for groundwaters, *i.e.* 1 – 4µg/l.

The May 2022 screen demonstrated that there were no hazardous substances within the leachate that were also present in the groundwater at the site adjacent locations BH3A and BH7A. Three hazardous pesticides namely dichlorprop, MCPB and bentazone were identified below the 0.1µg/l DWS for pesticides (at 0.03 – 0.06µg/l) prior to their mixing with the main groundwater system. However, as all of these had been depleted to below their <0.02µg/l detection limit at BH5A, and therefore could not affect the springs. These pesticides are

4 https://www.gov.uk/guidance/landfill-developments-groundwater-risk-assessment-for-leachate#screening-landfill-leachates
5 https://www.gov.uk/government/publications/protect-groundwater-and-prevent-groundwater-pollution/protect-groundwater-and-prevent-groundwater-pollution#hazardous-substances
6 http://www.wfduk.org/resources/groundwater-hazardous-substances-standards

common agricultural and domestic compounds. Their reporting in the 2022 screen is due to a reduction in the detection level applied in the most recent screen compared to previously. However, as the source is likely to include the landfill, the higher detection limit achieved for the landfill (all were reported at <10μg/l) then the dispersion / depletion rate on release from the site cannot be fully verified. Conclusions can however be drawn with respect to the non-hazardous herbicide mecoprop, which reduces in concentration from 17 – 33μg/l in the leachate to 1 – 8μg/l at BH3A and BH7A respectively and is then depleted to <0.02μg/l at BH5A.

Mecoprop is the only non-BTEX type substance consistently reported within landfill leachates as being present. However, as a non-hazardous herbicide, the risk rating for mecoprop is low, particularly given that the primary receptor is the baseflow to surface water and mecoprop is only slightly above the 18μg/l mecoprop EQS within the landfill, and significantly below EQS within groundwater.

3.3 Summary

The site contains a depleted landfill leachate, which is in the order of 1 – 10% of the strength of a typical non-hazardous landfill towards the end of its active lifecycle. Consequently, the pollution potential is low. Notwithstanding this, the landfill was operated as a dilute and dispersion landfill and therefore leachate was intended to escape via fissure flow towards groundwater. This is evident in BH3A and BH7A on the western perimeter of the site. However, there is no indication of a leachate influence on the eastern perimeter, to the northwest across the proposed quarry or the downgradient spring lines to the north of the site.

Persistent pollutants are at low concentrations with salts and heavy metals /metalloids within drinking water standards. Ammoniacal-N is present; however, concentrations fluctuate at source demonstrating that there is a limited residual reservoir, whilst monitoring at the off-downgradient locations indicate that any influence is rapidly depleted to negligible concentrations on mixing and dispersing in groundwater. There is therefore no likelihood of pollution due to ammoniacal-N.

The installation of an additional two leachate monitoring points demonstrates that the leachate across the site is as expected. There are none of the expected landfill hazardous substances present in the leachate, nor are there significant quantities of the pesticidal compounds usually found in leachates. There is therefore no potential for additional hazardous substances to be released from the landfill due to the proposed quarrying operation.

4. CONCEPTUAL HYDROGEOLOGICAL MODEL

4.1 Introduction

Conceptual hydrogeological models are intended to present a

Source $\Longrightarrow$ Pathway $\Longrightarrow$ Receptor

relationship between a pollution source and controlled waters, which can then be used within a hydrogeological risk assessment to determine the significance of the source and whether controls are warranted to prevent pollution.

At High Close quarry, the source is the residual pollution load within the landfill, and the receptor is groundwater within the host limestone. At present it is assumed that all leachate generated within the landfill has been entering groundwater at the rate produced since disposal operations commenced.

The presence of the quarry itself is unlikely to change this steady state; however, there is the possibility that there could be a subtle change in the pathway to groundwater. At present the pathway can be described as vertical migration through the base of the landfill, which would then disperse in a northerly direction under the regional hydraulic gradient and out fall at the valley then contribute base flow to springs such as the Farm Spring and the Flatts Beck Spring.

There is also a component of lateral dispersion, primarily in a westerly direction towards BH7A and BH3A. This is consistent with the 10° north westerly dip of the strata, however, any dispersion sphere in this direction is limited to a distance that does not extend as far as BH5A, the monitoring point at the northwest corner of the quarry development. There does not appear to be easterly (BH22A) or southerly (BH1A and BH15A) migration.

The three key monitoring points with respect to the proposed quarry are BH7A, BH3A and BH5A as these three locations straddle that part of the footprint of the quarry which could be considered as being within the potential sphere of influence of the landfill site. The hydrogeological pathway to the north, east and south of the landfill will not be affected by the proposed quarry development.

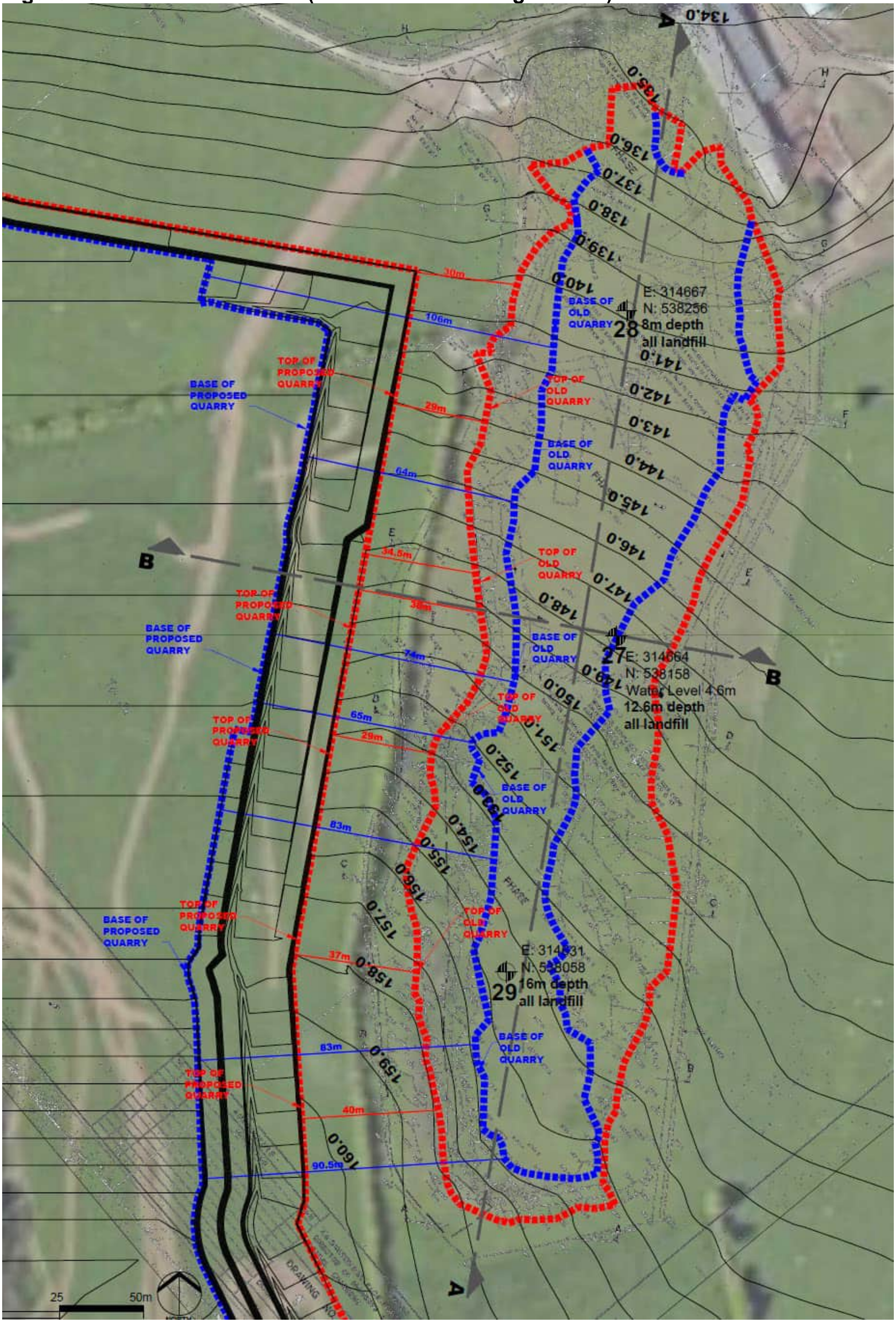
4.2 Changes to the Conceptual Model

The change in the hydrogeological pathway is the zone to the west of the landfill and is outside of the nominal 15m buffer zone which will be left unworked between the landfill and the quarry. The design of the quarry operations is however for a larger offset of between 29m to 40m at the ground surface.

The standoff distance then increases with depth to the base of the quarry to between 64m and 90m from the landfill. This offset distance at the base of the quarry is a similar size as the width of the landfill (Figure 18).

This pathway change can be summarised as a curtailing of the existing unrestricted lateral pathway that leachate could disperse in a westerly direction through the limestone’s fissure network instead of seeping vertically to the groundwater surface.

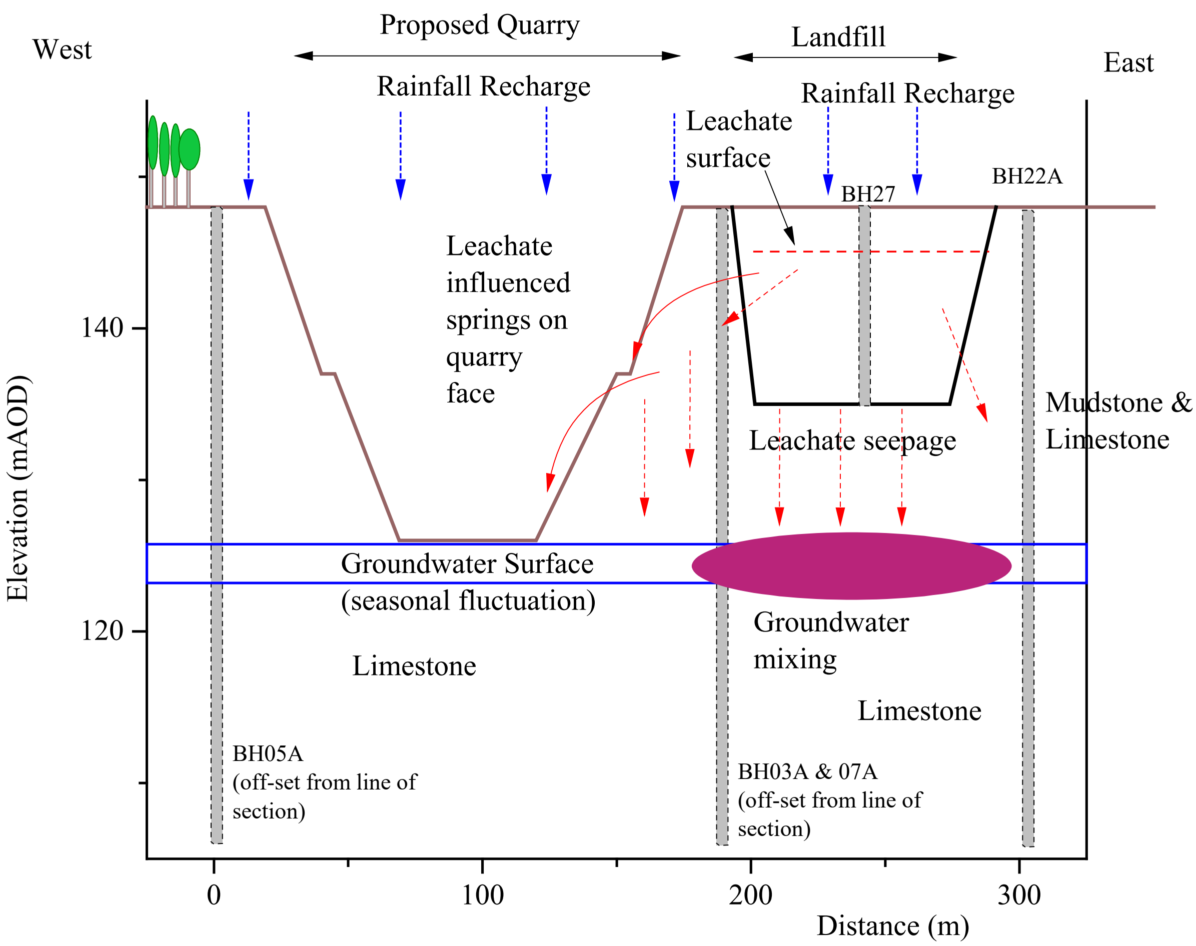
Figure 18 Off-set Distance (Extract from Drawing 2934\01)



A schematic representation of the hydrogeological setting is presented as Figure 19, a west to east cross section through the in-waste monitoring point and nearby BH22A and BH27. This is a vertically exaggerated section with a more representative vertical-horizontal relationship illustrated present as Figure 3 and Drawing 2934\03.

The relative positions of BH03A and BH07A are shown in the buffer zone between the surface of the landfill and the edge of the proposed quarry. BH05A is similarly off set from the line of section, but actually located downgradient of the quarry to the north, and therefore also act as a downgradient monitoring point for any influences from the quarrying works as well as from the landfill.

Figure 19 Schematic Hydrogeological Conceptual Model



In the event that leachate could disperse laterally to the quarry face, then the resultant leachate would emanate as a spring from the newly created quarry cliff face. However, given that the minimum off-set from the landfill is some 29m and leachate is ~5m below the ground surface within the landfill, then the minimum lateral distance to the cliff face is likely to be in the order of 35m to 45m.

Dispersion is under the influence of gravity through a fissure network and is limited by the fissure network and therefore a greater proportion of the flow is expected to be vertical compared to lateral. Therefore, given that the quarry face increases in distance with depth to between 64m and 90m through the quarry's vertical profile, there is a reasonable likelihood that a landfill influenced seepage will not be observed within the quarry.

Notwithstanding the low likelihood of a landfill influenced spring occurring on the eastern quarry sidewall, any spring outfall from the quarry face would flow to the base of the quarry and then re-enter the limestone fissure flow network or directly to groundwater via the proposed lake at the lowest point of the base of the quarry. This quarry lake may however be ephemeral as it is the operator's intention to limit the base of the quarry to the groundwater piezometric surface. Therefore the quarry will be operated dry, except for direct recharge due to rainfall, although some sidewall seepages may be observed, particularly where a mudstone unit is intercepted in the quarry face.

The limestone is a hard rock, not readily susceptible to failure; therefore it is unlikely that there will be any direct physical impact on the landfill itself. However, there is a "suggestion" that vibrations caused during quarrying could re-open up pathways which would otherwise have sealed due to particulate clogging, however, this is less rather than more likely, as pathway clogging in such systems, particularly within the limestone is likely to have become cemented overtime during the methanogenic stages of the site's lifecycle. It is this cementation process common to all landfill sites that enhances the natural containment properties of landfill's mineral barriers and/or geological host materials.

The potential effect of vibration from blasting has been assessed in a geotechnical report (Review of Slope Stability and Blasting Adjacent to the Former Landfill April 2021**)** Appended. The conclusion of the report is that vibration damage to the limestone buffer zone is unlikely and can be limited by good blasting practice.

Larger open conduits in fissured flow rocks are likely to remain unsealed throughout the life cycle of the landfill, and therefore this pathway will remain unaffected by the quarry operations. The secondary effect of vibration suggested is therefore likely to be in the form of a single pulse release of leachate retained within the landfill site. If such a situation did occur then there is expected to be a short period that a larger volume of leachate entered groundwater, followed by the resumption of a steady-state conditions. Consequently it is expected that the landfill's current steady-state regime would re-establish, and then continue to deplete as the landfill stabilises.

The changes to the hydrogeological system can be summarised as that the overall impact on the groundwater system and the associated spring lines that the groundwater system will discharge to downgradient (to the north) of the site will **remain unaffected**. However, there is the potential for leachate influenced seepages to occur on the eastern flank of the quarry adjacent to the western side of the landfill by the proposed quarrying scheme.

4.3 Quarry Flank Seepages

The primary change to the hydrogeological system is that the lateral migration of leachate, as primarily observed at BH7A could continue over the entire distance between the landfill and the sidewall of the quarry, a distance of at least 30m (from the leachate surface within the site) and increasing to 70m at the base of the quarry.

This pathway length is shortest near the leachate surface and then increases with depth proportional to the slope of the original landfill quarry and the proposed quarry faces. Therefore although limestone quarries are often steep, near vertical sided, when benches are taken into consideration the pathway length is likely to be at least double, if not triple the potential horizontal pathway length near the original ground surface.

This pathway will be subject to two water sources, the first is lateral migration of the closed landfill site's leachate and the second incidental rainfall entering the limestone along the pathway length. It is however difficult to estimate the quantity of leachate that could contribute to a hypothesised spring at the quarry face. In the first instance a high level spring would have the shortest pathway from the landfill; however, there would also be a limited lateral hydraulic gradient towards the quarry face. In contrast there is a greater potential for increased horizontal dispersion through the fissure network with depth, which is in turn mitigated by the increased pathway length. There is therefore only a limited potential for a significant quantity of landfill leachate to become exposed at the surface.

Although there is the potential for leachate to be observed at the quarry face, this water would be restricted to the base of the cliff face on quarry bench's part way up the quarry face and / or at the base of the quarry's eastern face. This water could therefore be readily intercepted and channelled to a zone where it can be monitored and managed as appropriate to prevent pollution. The low potential pollution risk is therefore to:

- the workforce within the quarry who may be exposed to leachate; and
- surface water in the water body area proposed in the north of the quarry at the later stages of quarrying, some 10 years from the commencement of the development.

The water level within this lake will be dependent on seasonal groundwater levels, and therefore dependent on the final basal elevation of the quarry there may not be a permanent surface water body.

4.4 Hypothetical Leachate Seepage Quality

Water quality data is available for both the leachate body within the landfill and groundwater influenced by the leachate. The monitoring data collected to date at the priority seasonal periods, when pollution loads are expected to be at their highest, *i.e*. summer to autumn and this data demonstrates that there is no expectation of a significant hazardous or persistent pollution component.

However, this data does demonstrate that

1) there are low hazardous organic substances none of which are sustained over multiple monitoring events or locations and therefore do not present an ongoing risk to groundwater;
2) only one hazardous metal and metalloid is present, namely arsenic at approximately 30% of the 10µg/l DWS, *i.e*. below potable water quality standards;
3) a limited quantity of the non-hazardous metal nickel, at concentrations which generally approximate to the 20µg/l nickel DWS,
4) ammoniacal-N is locally present in the leachate and fluctuates from <2mg/l to 175mg/l. This is a limited reservoir, which will continue to deplete over time and as there is no downgradient expression of this ammoniacal-N at the current point in time, no future influence is expected.

Persistent pollutants are at low to negligible concentrations which cannot adversely affect off-site groundwater quality. The substances present at environmentally significant concentrations associated with the landfill are therefore degradable and in the case of the BTEX / substituted BTEX volatile. The concentration range observed is within the process capability of sustainable, passive treatment systems, *i.e*. reed beds. There is therefore no likelihood of pollution due to ammoniacal-N or other substances within the quarry and neither is there expected to be any exacerbation of the landfill's existing influence on groundwater chemistry

5. MITIGATION SOLUTIONS

There are three sustainable options for managing a landfill influence on the site, with their implementation dependent on the developmental stage of the quarry. These options however will be informed by data collected during the operation of the quarry in the event that cliff face seepages containing leachate are observed.

These stages can be summarised for the section of the quarry to the west of the landfill as:

1) Early quarry development – quarry works are at too high an elevation, or too large a distance to be affected by leachate (*i.e*. works in the western zone of the quarry, and at <5mbgl at the east of the quarry)
2) Mid Development - quarry works have exposed up to a 10m quarry face, *i.e*. to below 140mAOD adjacent to the landfill area
3) Later development when excavation to the base of the quarry has taken place adjacent to the edge of the quarry

In the first instance, if seepage is observed during early quarry development it is recommended that advantage is taken of benches in the quarry face, by constructing a ditch type /depression or pipework on the sidewall bench that can channel cliff face seepages to an accessible point for monitoring and collection. High elevation seepages are expected to be the most dilute, as they would be derived from the section of the landfill exposed to the highest level of flushing and therefore the weakest leachate within the landfill, whilst this zone is expected to be exposed to the highest degree of dilution from rainwater ingress along the pathway, and then direct dilution by run-off captured by the channel on the bench.

Mitigation is therefore not expected to be required at a high elevation bench on the quarry. However, in the event that some mitigation is required, it is recommended that the channel / ditch is excavated to a depth of 0.3m, lined with soils as a growing substrate and then colonised naturally by reeds. A limestone gravel fill above the soil layer will both prevent direct exposure to the water and convert the channel into a sub-surface flow reed bed.

In the longer term, *i.e*. when the quarry has developed to its full depth to the north of the site, any high-level interception systems can be replaced by a lower level interception system at the base of the quarry face. This would then preferentially channel the eastern quarry face seepages to a more formal reed bed which could be constructed at the northern end of the quarry, with an outfall directed to a quarry water body in continuity with groundwater.

The advantage of a progressive design is that controls can be determined by the actual water quality at the base of the quarry at each point in time and integrate both pollution control and surface water management measures. A suitable surveillance programme targeting the key landfill leachate indicators, ammoniacal-N, chloride and nickel can therefore be implemented to determine the management solution at each point in time, *i.e.*:

- an interception channel used primarily for surface water management purposes
- an interception channel converted to an elongated reed bed treatment system; and/ or
- a formal reed bed system at the lowest point in the quarry

- a collection mechanism towards a holding tank with off-site tankering point

The advantage of such a system is that it allows both surveillance and the option to implement sustainable treatment of a low strength residual pollution source. However, in the unlikely event that a more concentrated landfill effluent is identified which is outside of the treatment capacity of an on-site system and discharge to the environment then, this approach readily allows a contaminated effluent to be collected and tankered off-site.

6. ECOLOGICAL IMPACTS

In an early Ecological Addendum prepared by Rigby Jerram it was considered that the Zone of Influence of the proposal need to be extended to encompass Flatts Beck as the beck arises from springs originating at the base of the limestone beds which are proposed to be quarried at High Close. The revised (October 2021) Ecological Addendum has taken into account the hydrogeological assessment work in Appendices 10 and 11 and concludes that the proposed quarry will have a neutral impact on the ecology of Flatts Beck and the River Ellen.

Flatts Beck is a tributary of the River Ellen and rises at Flatt Beck Spring some 740m northwest of the proposed quarry void. Farm Spring to the north northeast of High Close also flows into Flatts Beck and is 510m from the proposed quarry void.

This redefinition of the Zone of Influence is important as it takes into account the potential for changes brought about by quarrying on the local hydrogeology and potential hydrological impacts on Flatts Beck. It also takes into account potential impacts of quarrying on the seepage of leachate from the adjacent landfill into the groundwater and potential pollution impacts of this on Flatts Beck

However, the potential for a dilute and dispersion landfill to influence the underlying groundwater system and any downgradient baseflow contribution to surface water peaks in the latter years of landfill operations and the first few years of aftercare. It is during this period that landfill leachates have their greatest pollution potential, however, this pollution potential is primarily due to the release of readily soluble non-hazardous organic compounds. This lifecycle stage for the landfill would have occurred in the 1990s and has now ceased and the landfill has entered into its final stabilising period. Notably Cumbria Council ceased to monitor the downgradient springs and streams following a demonstration that the landfill was not affecting water quality. Given a further 13 years of stabilisation, then it is not considered likely that there is a residual reservoir of potentially toxic substances which could adversely affect the ecology in the tributary springs and streams to Flatts Beck. Consequently it is considered that Flatts Beck is outside of the sphere of influence of the landfill

7. PROPOSED MONITORING SCHEDULE

This assessment has demonstrated the low potential for the proposed quarry to adversely affect groundwater quality or to act as a conduit which would cause leachate to be exposed at the surface (*i.e.* within the quarry). However, the applicant appreciates the sensitivity with respect to water quality, and therefore a targeted monitoring programme has been proposed.

This monitoring programme is targeted towards demonstrating that the quarry operations do not adversely affect leakage from the landfill or act as a short-cut in the quarry itself , and therefore the schedule is to be based on the following locations

1) Landfill (BH27, BH28 & BH29)
2) Upgradient (BH15A or BH1A – dependent on location of quarry footprint)
3) Between Landfill and Quarry (BH7A & BH3A)
4) Downgradient (BH5A, Flatts Beck, Farm Spring)
5) Seepages on quarry eastern sidewall and any ponding at the lowest point in the quarry

The monitoring suite is based on two factors

1) key landfill leachate indicators
2) key determinands in leachate potentially above potable water quality standards

It is proposed that this monitoring schedule (Table 5) is undertaken on a quarterly basis following the issuing of a planning permission for the first four years of the quarry operations. A report on the monitoring should be prepared on an annual basis, commencing on the first anniversary of the commencement of quarrying works. These reports should also be used to identify whether any mitigation works as described above are necessary. In the event that mitigation measures are required, a report detailing the management controls and design should then be prepared.

It is recommended that this schedule is then reduced following the submission of a report justifying the changes to the schedule and agreement with the competent authority (*i.e.* Allerdale Borough Council).

Table 5 Proposed Monitoring Schedule

Determined	Frequency (Short Term)	Frequency (Long Term*)
pH & EC	Quarterly (years 1 – 4)	Annually (years 5 – 10)
Ammoniacal-N, Chloride Potassium, Nickel		
Water Level		

Subject to agreement with competent authority

8. CONCLUSION

This report responds to and addresses the planning application consultation queries and objections raised by the Environment Agency and Allerdale Borough Council Environmental Health with respect to the hydrogeological aspects of the continued development of the High Close limestone quarry. All the various queries have been incorporated into Cumbria County Council's Regulation 22 request for further information.

The High Close landfill site is a dilute and disperse landfill within a dormant limestone quarry permission area. The landfill is cross-gradient and down-gradient of the area where the quarrying works are proposed. The separation distance between quarry and the closed landfill is 29m at ground level to 90m at the base of the quarry.

Quarrying works will also be generally limited to the zone above the groundwater. Therefore there will be a physical separation of the quarry workings from landfill leachate which has dispersed through the base of the landfill.

A discernible landfill influence can be identified on the groundwater system within monitoring points located within the buffer zone between the landfill and the proposed quarry area. This has in turn raised concerns that there could be a surface outbreak of leachate into the quarry.

Monitoring data however demonstrates that the leachate contains low to negligible hazardous and non-hazardous substances, whilst those substances present are readily degradable and within the concentration range where passive treatment techniques can be used to prevent pollution of controlled waters.

A conceptual scheme of interception channels, modified to perform as reed beds on benches and /or the quarry base adjacent to the quarry wall facing the landfill, which then feed into a larger wetland at the base of the quarry which in turn discharges to groundwater has been proposed. However, the need for such a system is considered as precautionary, and any implementation should be based on a surveillance programme that demonstrates that treatment is necessary. A monitoring schedule has been proposed that encompasses the landfill, the quarry and downgradient receptors (*i.e*. springs and tributaries to Flatts Beck).

It is further recommended that the detailed design and any other associated regulatory requirements of such a system are included as a condition to the site's planning permission.

9. AUTHORSHIP

This report has been prepared by

Dr Craig Fannin PhD, MSc, BSc, CChem, CSci, FGS.
Technical Director
TerraConsult Ltd

Dr Fannin is a Chartered Chemist, Chartered Scientist and Fellow of the Geological Society with 20years' experience in Environmental Consultancy with a strong focus on the design, management and operation of waste management sites. Dr Fannin specialises in water, soil and waste chemistry, emissions potential and control, following a research doctorate evaluating the immobilisation of radionuclides within near-surface and geological disposal facilities.

Dr Fannin leads the commercial consultancy side of TerraConsult's leachate management and environmental risk portfolio. This includes the provision of annual landfill leachate, landfill gas and environmental water reviews for Enovert's (formerly Cory Environmental) entire portfolio of landfill sites over the previous 15 years. Dr Fannin is currently providing consultancy advice to SUEZ, FCC, Veolia, Enovert, Cornwall Council and Oxfordshire Council with regards to leachate management, leachate hydrogeology and landfill gas risk targeted towards designing the ongoing management controls at landfill site.

As a waste chemicals specialist he has undertaken two recent major reviews for the Environment Agency, comprising the authoring of the Waste Sampling and Testing guidance formally issued in August 2013. This guidance was prepared in parallel with the WM3 update to WM2, "The interpretation and classification of hazardous waste". The second review undertaken on behalf of the Environment Agency was for a risk assessment of the leaching behaviour of Incinerator Bottom Ash Aggregate (IBAA). This Controlled Waters risk assessment culminated in in the release of statements within the Environment Agency's Regulatory Position Statement 17.

Dr Fannin is currently preparing a Review of Landfill Leachate on behalf of the Landfill–Environment Agency Liaison Group. This is the first major review of leachate chemistry produced with the benefit of the comprehensive dataset collected under the PPC / Environmental Permitting Regulatory frameworks. The review has been designed on behalf of both regulators and industry to provide a full understanding of leachate chemistry.

Appendix A

Regulatory Consultation Responses

Environment Agency and Environmental Health

From:	Cain, Richard [redacted]
Sent:	01 November 2019 14:40
To:	Brophy, Rachel
Subject:	2/19/9011

FAO Rachel Brophy

Allerdale Environmental Health has reviewed the Application and attached Environmental Impact Assessment. Please see below comments and recommendations.

Appendix 4 Noise

Environmental Health have the following comments regards the Appendix 4 report.

- Environmental Health are satisfied with the worst case sound source levels which are taken from BS 5228 or previous studies where appropriate. Although methodology is discussed and appears adequate full detail of calculations used to ascertain the predicted noise levels at the receptors should be provided.
- Environmental Health note missing detail in regards quantified impact levels (Observed Adverse Effect Levels,(no / Lowest Observed Adverse Effect Level). There is no clear quantification discussion other than the noise is not a Significant Observed Adverse Effect Level.
- WHO guideline noise levels do not appear to have been considered or discussed against the predicted levels at any of the receptors. Particular concern is raised for the closest receptor High Close Farm which may be occupied as a residence. Effect on residential properties using BS 8233:2014 should also be discussed before impact levels are quantified.
- Although time averaged sound levels have been provided further information on instantaneous sounds levels (LMax) should also be discussed before instantaneous effect levels being discounted.

Environmental Health agree the sound levels which have been put forward are in compliance with the current national guideline noise planning condition for mineral planning.

Appendix 5 Dust and Air Quality

Additional regulation in regards to control of Dust and Air Quality will be required under Pollution Prevention and Control Regulations 2016.

This process will require a permit with conditions as advised in the Pollution Prevention and Control (England and Wales) Regulations 2016 before operations commence, and the applicant is advised to contact the environmental health service for confirmation and application.

Appendix 6 Blasting

Environmental Health have reviewed the information submitted in Appendix 6 of the Environmental Statement. Environmental Health are satisfied that the effects on neighbouring buildings has been quantified.

Environmental Health feel there is not enough detail provided in terms of the nuisance and amenity effects on people residing at the identified receptor points.

Blasting creates vibration which is of very short duration, with a frequency of events varying from a small number per year to several times per day, depending on the nature and size of the extraction operation. The frequency of blasting (number of blasts per day, week ,year) has not been identified within the report. The frequency of events is key determining the impact in terms of nuisance and amenity.

In terms of Nuisance and Amenity Environmental Health wish to draw attention to the following information taken from BS 5228-2:2009 Code of Practice for noise and vibration control on Construction and open sites. The following information relates directly to Blasting and best practice.

BS 5228 Part 2 Para 4 Community Relations

"Vibration and air overpressure from blasting operations is a special case and can under some circumstances give rise to concern or even alarm to persons unaccustomed to it. The adoption of good blasting practices will reduce the inherent and associated impulsive noise: prior warning to members of the public, individually if necessary, is important."

BS 5228 Part 2 Para 6.3

> "c) Duration of site operations. In general, the longer the duration of activities on a site, the more likely it is that vibration from the site will prove to be an issue. In this context, good public relations and communication are important. Local residents might be willing to accept higher levels of vibration if they know that such levels will only last for a short time. It is then important that site operations are carried out according to the stated schedule and that the community is informed of their likely durations.
>
> d) Hours of work. Sensitivity to vibration at different times of the day is far more complex than sensitivity to noise. The sensitivity of the human body to vibration varies according to the direction and frequency of the vibration
>
> e) Attitude to the site operator. It is well established that people's attitudes to vibration can be influenced by their attitudes to the source or activity itself. Vibration from a site will tend to be accepted more readily by local residents, if they consider that the contractor is taking all possible measures to avoid unnecessary vibration. The attitude to the contractor can also be improved through good community liaison and information distribution and the provision of a helpline to respond to queries or complaints. The acceptability of the project itself can also be a factor in determining community reaction".

Appendix 9 Geo Technical Assessment Of The Quarry Design
and
Appendix 10 Hydrogeology and Hydrology

Environmental Health have reviewed the submitted information and have concerns in regards to past use of the land as a Landfill.

Environmental Health are in agreement with the objection raised by the Environment Agency Ref- NO/2019/112052/01-L02 in response to insufficient information to demonstrate that the risk of pollution to controlled waters is acceptable.

The applicant/developer's attention is also drawn to the fact that there is the potential of contaminated land, soils and gas (potential for production and migration of landfill gas which may affect structures on or in proximity to the landfill site). You are reminded that the responsibility for safe development rests with the owner and/or developer.

Appendix 11 Proposed Planning Conditions

<u>Proposed conditions</u>

<u>Noise Conditions</u>

- Conditions 4,5,6. should be instated on any approval.

- Condition 4 – amendment as follows is required in regards to background noise levels as no specific measurement unit has been specified. "Background noise level measured at any receptor should be via (LA90,1h) at any noise-sensitive property."

In addition to the proposed conditions Environmental Health recommend the following condition to control noise emanating from the site.

- Before the development commences, a scheme shall be submitted to and agreed in writing by the local planning authority that specifies the provisions that will be implemented for the control of noise emanating from the site. The noise mitigation scheme shall be maintained for the life of the approved development and shall not be altered without the prior written approval of the local planning authority. The noise mitigation scheme must be inclusive of all mitigation measures presented in Appendix 4 Noise of the Environmental Impact Statement, it must also assure full compliance with all proposed noise conditions.

Control of Vibration Conditions

- Conditions 7, should be instated on any approval to control effects of any blasting.
- Condition 8 Should be amended in that a blast monitoring scheme shall be submitted and approved in writing by the mineral planning authority prior to the commencement of any blasting activities The scheme should robustly demonstrate compliance with Condition 7.

Further Condition recommended by Environmental Health

- Before the development commences, a scheme shall be submitted to and agreed in writing by the local planning authority that specifies the provisions that will be implemented for the control of vibration and air overpressure from blasting. The mitigation scheme shall be maintained for the life of the approved development and shall not be altered without the prior written approval of the local planning authority. The mitigation scheme must be inclusive of all mitigation measures presented in Appendix 6 Blasting of the Environmental Impact Statement, it must also assure full compliance with all proposed control of vibration conditions and use best practice for community relation and neighbourhood nuisance as stated in BS 5228-2:2009. A blasting schedule should be maintained and made available to residents with blasting confined to times of the day when disturbance is less likely.

Contaminated Land

Further Condition required by Environmental Health

Contaminated Land Conditions

1. Risk Assessment:
No development approved by this permission shall commence until a desktop study has been submitted to and approved by the Local Planning Authority. Should the preliminary risk assessment identify any potential contamination which may affect human health, controlled waters or the wider environment, all necessary site investigation works within the site boundary must be carried out to establish the degree and nature of the contamination and its potential to pollute the environment or cause harm to human health. The scope of works for the site investigations should be agreed with the Local Planning Authority prior to their commencement.

2. Submission of Remediation Scheme
Where land affected by contamination is found which poses unacceptable risks to human health, controlled waters or the wider environment, no development shall take place until a detailed remediation scheme has been submitted to and approved in writing by the Local Planning Authority. The scheme must include an appraisal of remediation options, identification of the preferred option(s), the proposed remediation objectives and remediation criteria, and a description and programme of the works to be undertaken including the verification plan.

3. Implementation of Approved Remediation Scheme

Should a remediation scheme be required, the approved strategy shall be implemented and a verification report submitted to and approved in writing by the Local Planning Authority, prior to the development (or relevant phase of development) being brought into use.

4. Reporting of Unexpected Contamination
In the event that contamination is found at any time when carrying out the approved development that was not previously identified it must be reported immediately to the Local Planning Authority. Development on the part of the site affected must be halted and a risk assessment carried out and submitted to and approved in writing by the Local Planning Authority. Where unacceptable risks are found remediation and verification schemes shall be submitted to and approved in writing by the Local Planning Authority. These shall be implemented prior to the development (or relevant phase of development) being brought into use. All work shall be undertaken in accordance with current UK guidance, particularly CLR11.

Richard Cain MCIEH | Environmental Health Officer
Allerdale Borough Council, Allerdale House, Workington, Cumbria, CA14 3YJ
[redacted]

Cumbria County Council
Environment - Planning & Sustainability
CountyOffices
Busher Walk
Kendal
Cumbria
LA9 4RQ

Our ref: NO/2019/112052/01-L02
Your ref: 2/19/9010

Date: 17 October 2019

Dear Sir/Madam

APPLICATION FOR THE DETERMINATION OF NEW PLANNING CONDITIONS UNDER THE ENVIRONMENT ACT 1995 (AS AMENDED) FOR THE DORMANT MINERALS PLANNING PERMISSION REFERENCE CA49 INCORPORATING AN AREA FOR PLANT, STOCKPILING AND STORAGE; HIGH CLOSE QUARRY, HIGH CLOSE FARM, PLUMBLAND, ASPATRIA, WIGTON, CA7 2HF

Thank you for consulting us on the above application on, 9 September 2019.

Environment Agency position

We object to this development because there is insufficient information to demonstrate that the risk of pollution to controlled waters is acceptable. We therefore recommend that planning permission is refused.

Reasons

The proposed planning permission area includes a former domestic landfill which is known to be leaching contaminants into groundwater. A 15m buffer is proposed to segregate quarrying proposals from the landfill, but there is no data regarding the presence of organic and inorganic Hazardous Substances likely to be present in the leachate and contaminated groundwater. The quarrying proposal presents a risk that could exacerbate mobilisation and pollution potential of unknown Hazardous Substances into the underlying aquifer. The application's Hydrogeological report 2019 does not demonstrate that the risks of pollution have been understood or provide adequate mitigation for these risks.

This planning application has therefore failed to meet the requirements of paragraphs 170 and 178 of the National Planning Policy Framework.

Overcoming our objection

The applicant should provide information to demonstrate to the planning authority that the risk to controlled waters has been fully understood and can be addressed through appropriate measures. The hydrogeological report of June 2019 has been reviewed in context of the potential impact of development from the former County landfill site. It acknowledges that migration of leachate is occurring from BH27 inside the landfill to BH7A, although it is draining very slowly.

The data provided supports the understanding for a conceptual groundwater flow direction from South to North based on the quality of boreholes 15A and 5A, although it is acknowledged that fissure flow can transmit groundwater in circuitous and unpredictable routes. The report suggests there are discrepancies in laboratory analysis between sampling rounds. Laboratory reports should be submitted to ensure quality assurance comply with UKAS accreditation.

The groundwater analysis does not cover seasonal variation and is limited to general groundwater chemistry. Assessment for leachate analysis should be referenced from current waste management guidance and include organic analysis and metals.

We agree the 15 metre buffer between landfill and quarry should not have any impact on whether the landfill was lined or not. However, there has been no review of the effect of blasting/quarrying on: fractures/fissures, transmission and quality of leachate migrating from the landfill mass. The impact from quarrying activities could have a direct and increased derogatory effect on the quality of groundwater entering the quarry which is already contaminated with leachate. The applicant in knowledge of the increased pollution potential from this development is required to take responsibility for treatment of contaminated groundwater entering the quarry. In knowingly permitting discharge of the groundwater via the proposed soakaway, the Agency can only endorse the discharge of uncontaminated water.

The limitations stating that basal excavations should not generally go below the water table is acceptable.

It must be stressed that a more comprehensive list of organic and inorganic contaminants is required to be assessed from the leachate and groundwater monitoring installations. The Agency cannot determine acceptable risk of this development without an assessment of the presence or absence of Hazardous / Listed Substances.

If, following further investigation, substances prohibited from discharge to groundwater are identified, the outlined proposals for an interceptor for suspended solids prior to discharge via soakaway as the sole form of treatment is unacceptable.

We recommend the applicant develops a detailed contingency plan for management, interception and treatment of contaminated groundwater. The Agency will object to any soakaway discharge in the absence of further assessment.

Note to applicant

Should you wish us to review any technical documents or want further advice to address the environmental issues raised, we may do this as part of our charged for planning advice service.

Further engagement will provide you with the opportunity to discuss and gain our views on potential options to overcome our objection with us, before formally submitting further information as part of your planning application. It should also result in a better quality and more environmentally sensitive development.

As part of our charged for service we will provide a dedicated project manager to act as a single point of contact to help resolve any problems. We currently charge £100 per hour, plus VAT. We will provide you with an estimated cost for any further discussions or review of documents. The terms and conditions of our charged for service are available here.

If you would like more information on our planning advice service, including a cost estimate, please contact us at clplanning@environment-agency.gov.uk.

Yours faithfully

Mr Jeremy Pickup
Planning Advisor - Sustainable Places

Direct e-mail clplanning@environment-agency.gov.uk

End

Appendix B

High Close Quarry
Slope Stability and Blasting Adjacent to the Closed Landfill

KEVAN WALTON ASSOCIATES Ltd

Geotechnical, Mining and Quarrying Consultants

Walnut Bank Lodge, Stodday, Lancaster, Lancs., LA2 OAG
Tel: 01524 845299 Mobile 07931 546125
email: kwalton@mining-geotechnics.com

13th April 2021

HIGH CLOSE QUARRY

REVIEW
of
SLOPE STABILITY AND BLASTING ADJACENT TO THE FORMER LANDFILL

1 Background

The stability of the proposed quarry at High Close was reviewed by Kevan Walton, an Associate of TerraConsult in 2017 as part of the planning process for development of the quarry. A further report was issued by Kevan Walton Associates dated 4th April 2020 entitled *High Close Quarry Proposal, Slope Stability and Blasting Adjacent to the Former Landfill*, which considered the effect of blasting on the stability of the slope between the quarry and the adjacent historic landfill. These reports are summarised below and should be read in conjunction with this report.

Both of the previous reports considered a stand-off of 15m between the top of the quarry and the top of the landfill, corresponding to the distance from the quarry top to the landfill planning boundary. Since then, historic survey data of the landfill has been obtained to better define the limits of the landfill and this has been used to form the current report.

This and the previous reports address the stability of the slopes only and the possible effect of blasting on such stability including disturbance to the rock mass. The reports do not address directly the possible movement of leachate from the historical landfill nor the vibration caused by quarry blasting as these are dealt with by others.

1.1 <u>2017 Report (TerraConsult)</u>

The 2017 report reviewed the overall quarry design taking into account stability issues and the requirements of the Quarries Regulations 1999. The review was based on experience with quarrying operations in similar geological environments. (When excavation commences additional Geotechnical Assessment will be required to verify the assumptions made).

The quarry will be excavated in limestone. Bedding is recorded dipping gently to the north west at up to 8°. The overall geometry considered was of 12m high faces inclined at 80° with safety benches of 5m width. Maximum overall height will be up to 46m with overall angle at this height of approximately 64°.

The ramp gradient at 10% and 12m wide is satisfactory.

Overburden and interburden will be stored in dumps and mounds with maximum slope of 1v:3h (18.5°) and these should be stable for the anticipated materials.

Slope stability analyses were undertaken on the eastern quarry face using the Rocscience SLIDE limit equilibrium computer programme. The modelling incorporated the historical landfill site to the east to assess if the quarrying operations would have any effect on the stability of the landfill.

Anisotropic strength parameters were used, relatively weak in the direction of the bedding and very high strength in other directions to simulate potential slip planes along bedding. The parameters used in the analysis are as follows:

Material	**Cohesion (kN/m^2)**	**Friction Angle (°)**	**Density (kg/m^3)**
Limestone Bedding (1°to 8° to horizontal)	0	30	2600
Landfill	5	25	1300

The results of the analyses indicated that the Factor of Safety for slip planes through the limestone bedding and the landfill will be 2.81.

1.2 2020 Report (Kevan Walton Associates Ltd.)

Subsequently, concern was raised as to the effect of blasting on the stability of the quarry slopes and therefore in 2020 seismic analysis of the slope was undertaken based on the previous quarry profile. The SLIDE slope stability programme has the facility to apply a seismic (earthquake) loading to the model and although they are not strictly the same, a seismic load of 0.1g was applied to assess the likely effect of blasting. This reduced the Factor of Safety from 2.81 to 1.95. This is still well within the acceptable Factor of Safety and is unlikely to cause any permanent movement of the rock along the bedding planes and hence damage to the adjacent landfill.

A literature search on the disturbance of intact rock from blasting operations concluded that disturbance of the rock to any significant depth was unlikely. Furthermore, good blasting practice was extolled to reduce any such effect and that implementation of smooth or pre-split blasting can further reduce any potential damage.

2 2021 Review

Further information has been obtained showing the boundary of the old quarry containing the landfill in detail and this has been presented as Stephenson Halliday drawings as follows and attached:

Figure 1 – Former Landfill Site Separation Distance from the Proposed Quarry
Figure 2 - Former Landfill Site Section A
Figure 3 - Former Landfill Site Section B

2.1 Analyses

Section B has been copied into the Rocscience SLIDE computer programme for Limit Equilibrium stability analyses.

Using this information extends the stand-off between the top of the quarry and the top of the landfill from 15m to approximately 38m.

The model used incorporates an Anisotropic Function as before, so that slip surface searches take into account the lower shear strength along bedding planes. Strength parameters are the same as used in the previous analyses and tabulated in Par 1.1 above.

Water level 5m below the surface of the landfill has been used with a simple drawdown from the edge of the landfill to the toe of the quarry slope. This water level in the landfill was confirmed by recently drilled boreholes.

Although blasting vibration and earthquake vibration are different (as outlined in our report of April 2020), a seismic co-efficient of 0.1g was also introduced to simulate the effect of blasting on the stability.

The rigorous Morgenstern-Price method of analysis was used.

3 Results of Analyses

The results of the analyses are summarised as follows and presented in Figures 4 and 5 below.

Loading	**Factor of Safety**
Static	3.05
Seismic	2.01

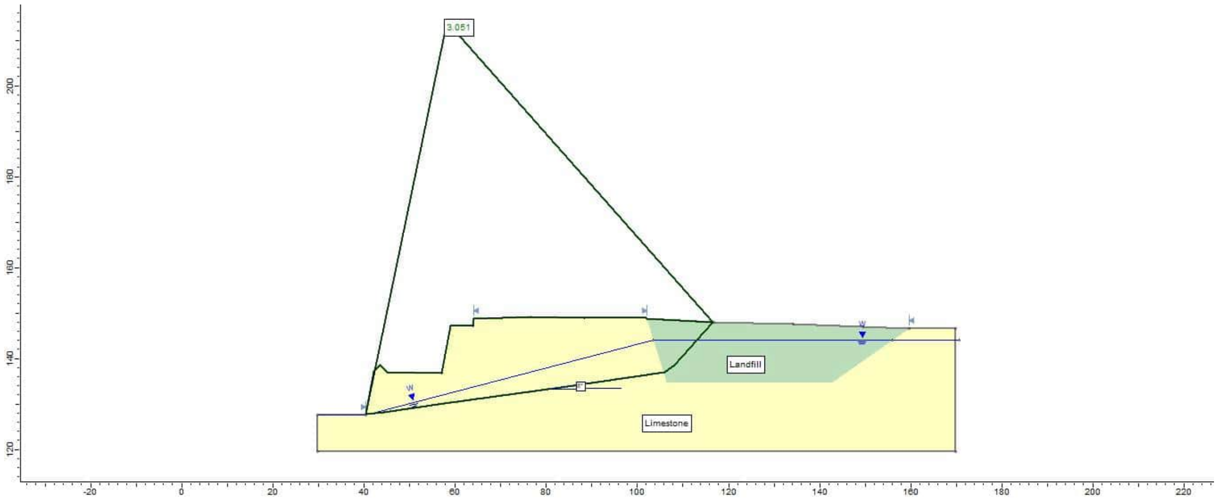


Figure 4 – Static Loading. Factor of Safety = 3.05

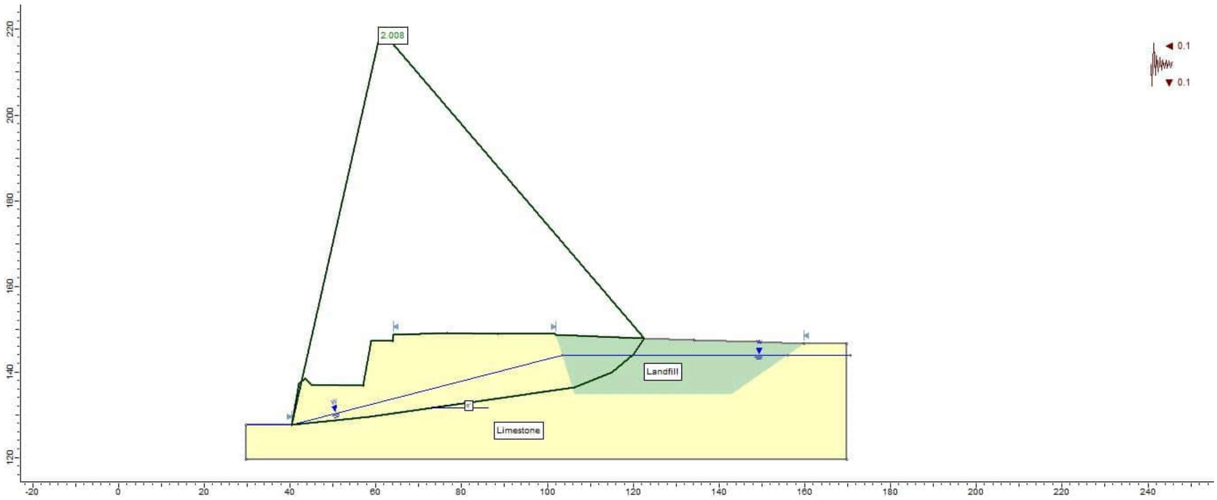


Figure 5 – Seismic Loading. Factor of Safety = 2.01

Although the Factors of Safety usually applied to operational quarry slopes are 1.2 or 1.3, where additional precautions are required then a Factor of Safety of 1.5 or 2.0 may be applied. For seismic loading a Factor of Safety of 1.0 or 1.1 is deemed adequate. Factors of Safety as analysed are therefore satisfactory.

4 Conclusions

4.1 Applying survey data of the old landfill to the east of the quarry extends the stand-off between the crest of the quarry face and the top of the landfill from the 15m previously analysed to about 38m. This increases the factor of Safety from 2.81 to 3.05, an increase of 0.14 or 5% for the static case.

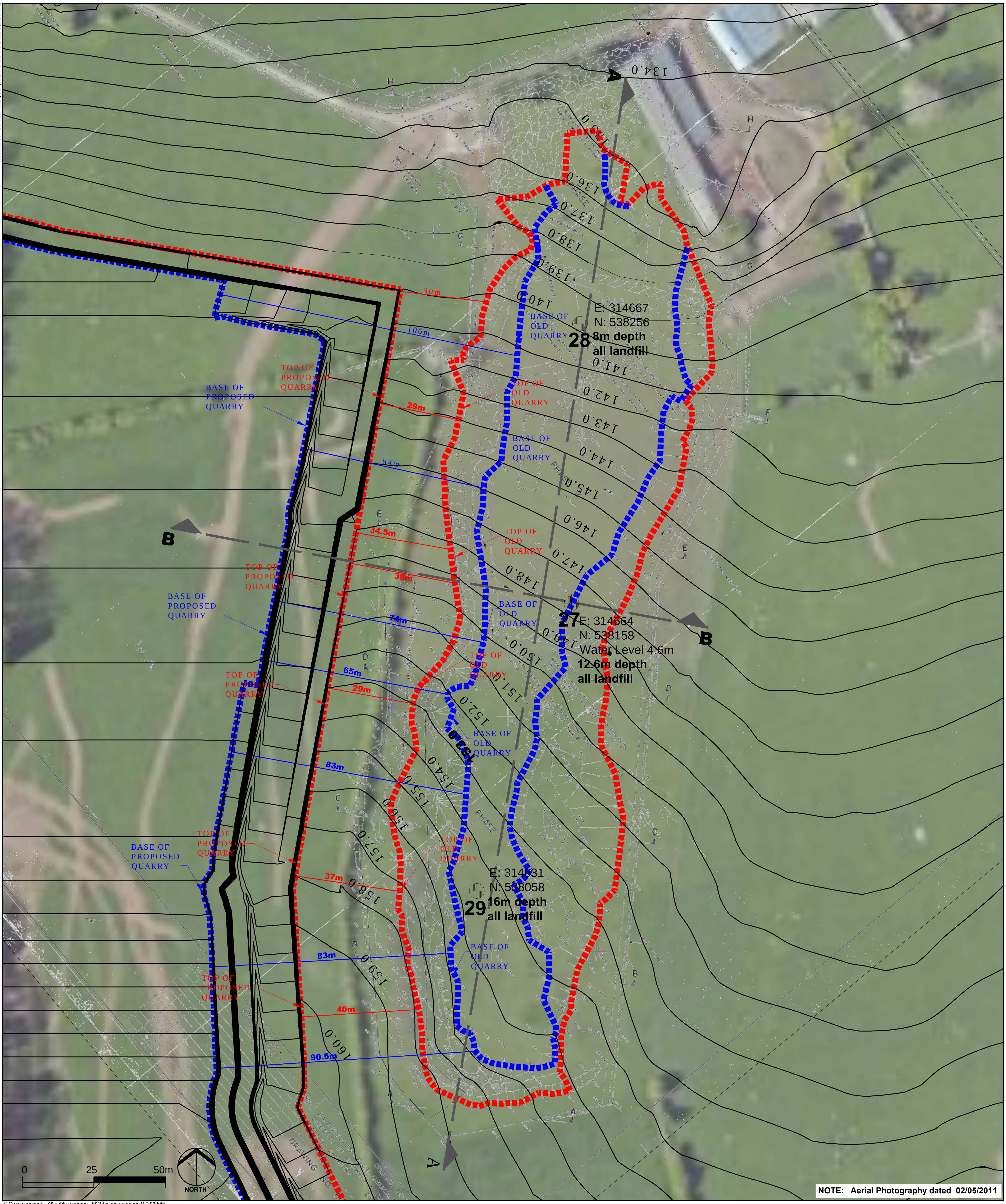
4.2 The corresponding change for the seismic analysis is to increase the Factor of Safety from 1.95 to 2.01, an increase of 0.06 or 3%. Blasting is therefore unlikely to cause instability of the slope between the quarry and the landfill.

4.3 Factors of Safety as analysed are satisfactory.

4.4 Although blast damage to intact rock can occur it is highly unlikely to penetrate to a significant depth. Damage due to blasting can be mitigated by good blasting practice and specialised blasting techniques.

[redacted]

K. S. Walton
B.Sc., M.Sc., C.Eng., C.Geol., M.I.M.M.M., F.G.S., F.I.Q., C.M.I.O.S.H.
Director
13th April 2020



KEY

- Former quarry / landfill site and proposed quarry top and base boundaries
- 2011 site survey, proposed full extraction and 5m OS terrain data at 1m contour intervals
- 1977 former quarry plan at full extraction prior to waste disposal landfill operations
- 37m — Top of old quarry to top of proposed quarry distance
- 83m — Base of old quarry to base of proposed quarry distance
- Landfill site boreholes
- Sections A & B

STEPHENSON HALLIDAY
Planning, Landscape & Environment

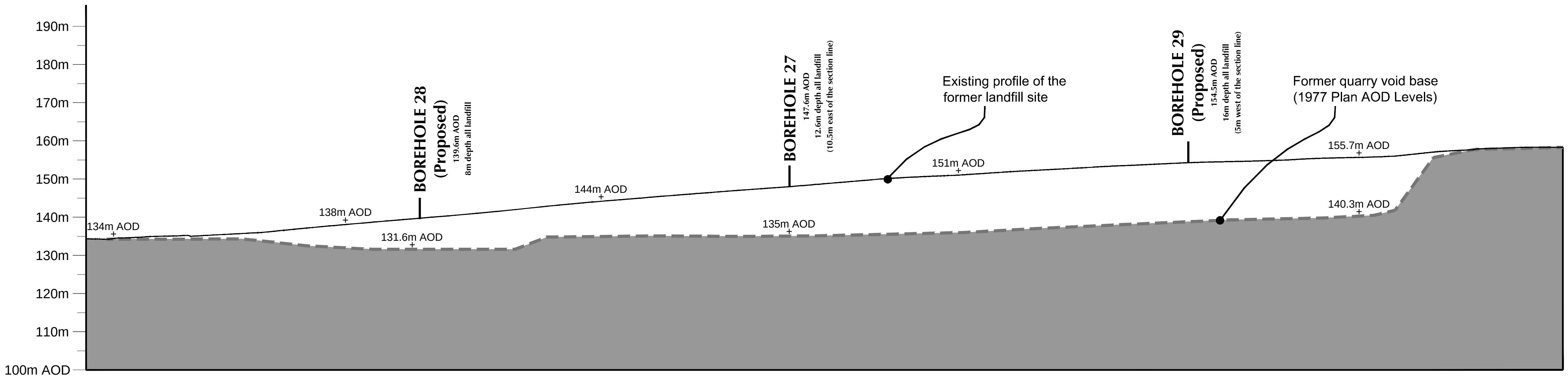
HIGH CLOSE QUARRY

FIGURE 1

Former Landfill Site Separation Distance from the Proposed Quarry

DATE	BY	PAPER	SCALE	QA	REV
FEB 2021	DF	A3	1:1,250	PS	B

2021-02-08 HCL-022Kf Old Quarry_Landfill Site Distances Update.dwg



SECTION A - A

KEY

Existing Landfill site profile

Former quarry 1977 void base

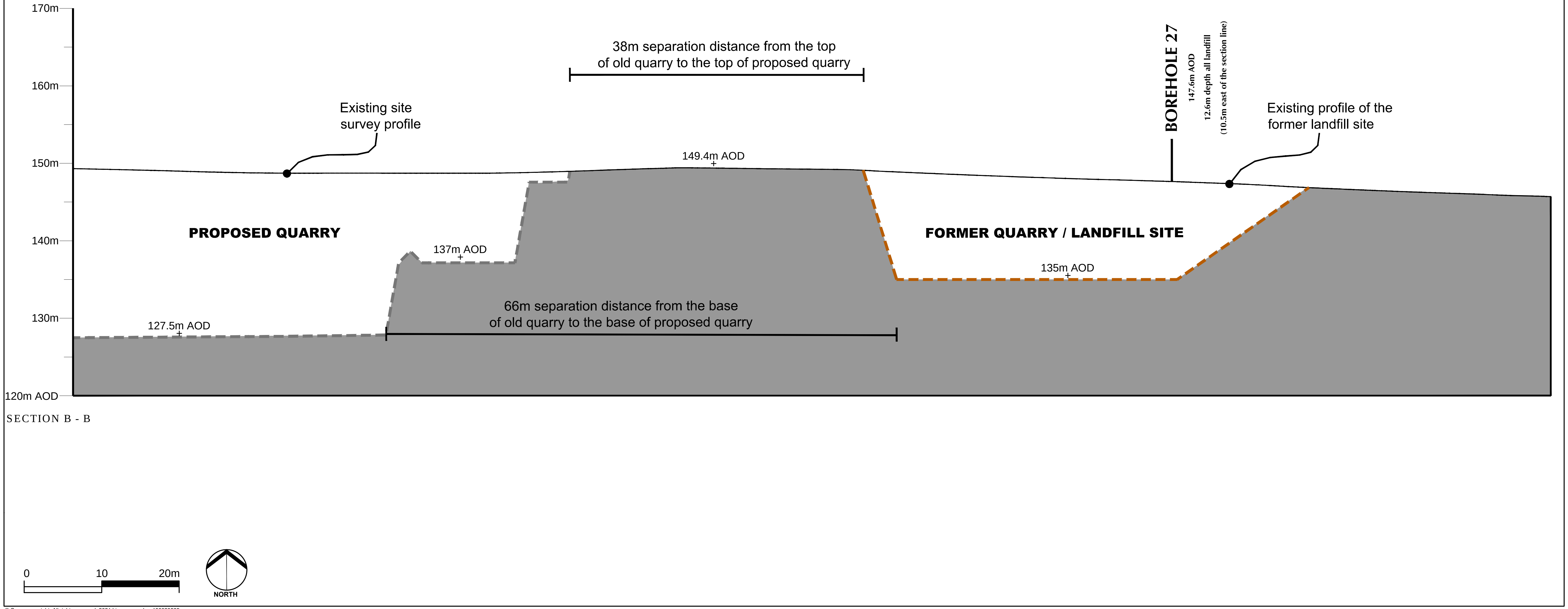
HIGH CLOSE QUARRY

FIGURE 2

Former Landfill Site: Section A

STEPHENSON HALLIDAY
Planning, Landscape & Environment

DATE	BY	PAPER	SCALE	QA	REV
JAN 2021	DF	A3	1:1,250	PS	A



SECTION B - B

KEY

- Existing site survey and landfill site profile
- Former quarry 1977 void base
- Proposed quarry void base

HIGH CLOSE QUARRY

FIGURE 3

Former Landfill Site: Section B

STEPHENSON HALLIDAY
Planning, Landscape & Environment

DATE	BY	PAPER	SCALE	QA	REV
FEB 2021	DF	A3	1:500	PS	-

APPENDIX 12:
PROPOSED PLANNING CONDITIONS

APPENDIX 12 – SUGGESTED PLANNING CONDITIONS

Time-limit

1. The winning and working of minerals or depositing of mineral waste shall cease no later than 21 February 2042. Thereafter the site shall be restored in accordance with the approved scheme within the next 24 month period.

Approved Documents

2. The development shall be carried out, except where modified by the conditions to this permission, in accordance with the following documents, hereinafter referred to as the approved scheme:
    - Planning Application Form dated 21 August 2019;
    - Environmental Statement (including appendices) entitled *'Regulation 22 Request for Further Information, Resubmission ES'* dated February 2023.
    - Figure 1: Site Location Plan
    - Figure 1A: Site Location Plan
    - Figure 8: Indicative Quarry Development Plan: Existing Site;
    - Figure 9: Indicative Quarry Development Plan: Phase 1;
    - Figure 10: Indicative Quarry Development Plan: Phase 2;
    - Figure 11A: Indicative Quarry Development Plan: Phase 3A;
    - Figure 11B: Indicative Quarry Development Plan: Phase 3B;
    - Figure 12: Indicative Quarry Development Plan: Phase 4;
    - Figure 13: Indicative Quarry Development Plan: Phase 5;
    - Figure 14: Indicative Quarry Development Plan: Final Restoration;
    - Figure 15: Indicative Quarry Development Plan: Section A-A;

3. Until such time as operations at the quarry permanently cease, or this permission is superseded, copies of this decision notice and the approved documentation referred to in condition 2 shall be kept available on site for inspection during the permitted working hours. The existence and contents of these shall be made known to all operatives who are responsible for the matters referred to in the documents.

Quarry Operations

4. No mining operations, soil stripping or handling, or restoration works shall take place outside the hours of:
    - 0700 to 1800 hours, Mondays to Fridays (except Public Holidays),
    - 0700 to 1300 hours on Saturdays

No mining operations, soil stripping or handling, or restoration works shall take place on Sundays or Public Holidays. This condition shall not operate so as to prevent the use of water pumping equipment and the carrying out, outside these hours, of essential maintenance to plant and machinery used on site.

Control of Noise

5. With the exception of short-term activities referred to in condition 6, noise from normal operations at the quarry shall not exceed:

    - 55 dB(A) LAeq 1h (free field) at High Close Farm House.
    - the background noise level measured at any noise sensitive property (with the exception of High Close Farm) by more than 10 dB.

    The noise levels are expressed as one hour free field LAeq's. Free field shall be defined as a point 3.5 metres in front of the façade of any noise sensitive property facing the mineral extraction operations. Any measurements to check compliance shall have regard to the effects of extraneous noise and shall be corrected for any such effects. A noise sensitive property shall be defined as any building outside the site used as a dwelling, hospital, school, place of worship, office or any other purpose where the occupants are likely to be adversely affected by an increase in noise levels. Background noise level measured at any receptor should be via (LA90,1h) at any noise-sensitive property.

6. For a maximum of 40 days in any 12 month period, noise arising from short-term activities such as soil and overburden stripping, the construction and removal of baffle mounds, soil storage mounds and spoil heaps, construction of new permanent landforms and aspects of site road construction and maintenance, shall not exceed 70 dB LAeq 1h (free field) at any noise sensitive property. Free field shall be defined as a point 3.5 metres in front of the façade of High Close Farm House facing the mineral extraction operations. Any measurements to check compliance shall have regard to the effects of extraneous noise and shall be corrected for any such effects.

7. Within twelve months of the date of this permission an updated noise monitoring and mitigation scheme for High Close Quarry shall be submitted to and approved in writing by the Mineral Planning Authority. The scheme shall include provision for the scheduling and completion of approved noise mitigation works, the number and location of noise monitoring points, the frequency of monitoring, details of the noise monitoring information to be collected and a schedule for the submission of results to the Minerals Planning Authority. The development shall subsequently be carried out in accordance

with the approved noise monitoring scheme and mitigation measures identified for the duration of the permitted development.

8. No vehicle, plant, equipment and/or machinery shall be operated at the site unless it has been fitted with and uses an effective silencer to be maintained in accordance with the manufacturer's specification at all times.

Control of Vibration

9. Blasting shall be undertaken in such a manner as to ensure that ground vibrations, measured as the maximum of three mutually perpendicular directions taken at the ground surface, does not exceed a peak particle velocity (ppv) of 6mm per second in 95% of all blasts measured over any continuous six month period and no single blast shall exceed a ppv of 9mm per second. The measurement is to be taken at or near the foundations of any vibration sensitive building not owned by the quarry owner or operator.

10. Prior to blasting taking place on site, blast monitoring measures shall be implemented in accordance with a scheme to be submitted for the written approval of the Local Planning Authority. The scheme shall include:

    a. Blast monitoring locations and frequency of monitoring.
    b. The monitoring equipment to be used to record ground vibrations and air overpressure.
    c. Presentation of results.
    d. Procedures to be adopted if vibration levels are exceeded.
    e. Procedures to be adopted if air overpressure levels are exceeded.

Protection of Groundwater

11. No working of minerals shall take place below the depth 120m AOD.

12. Any facilities for the storage of oil, fuels or chemicals shall be sited on impervious bund walls. The volume of the bunded compound should be at least 110% of the total tank capacity. If there is multiple tankage, the compound should be at least equivalent to the capacity of the largest tank or the combined capacity of interconnected tanks, plus 10%. At filled points, vents, gauges and sight glasses must be located within the bund. The drainage system of the bund shall be sealed with no discharge to any watercourse, land or underground strata. Associated pipework should be located above ground and protected from accidental damage. All filling points and tank overflow pipe outlets should be detailed to discharge downwards into the bund.

13. A groundwater and surface water monitoring schedule from the existing piezometer and surface water locations should be undertaken on a quarterly basis for the first four years of the quarry operations and thereafter on an annual basis for the lifetime of the development. An annual monitoring report shall be prepared on the first anniversary following the commencement of quarrying works. The reports shall be used to identify any necessary mitigation works. In the event that mitigation measures are required, a report detailing the management controls, design and timetable for implementation shall be prepared, with the mitigation works to be implemented accordingly. The monitoring criteria should be in accordance with Table 5 in Appendix 11 of the Resubmission ES to include: pH & Electrical Conductivity, Ammoniacal-N, Chloride, Potassium, Nickel and Water Level.

Control of Dust

14. Measures shall be taken at all times during the duration of the development to minimise the generation of dust. Such measures shall include those as outlined in Section 3 of the Air Quality Assessment prepared by Vibrock (dated 30 November 2022, ref: R21.9448/9/DW) and appended to the Environment Statement (Appendix 5).

Contaminated Land

15. Should the unexpected discovery of land affected by contamination which poses unacceptable risks to human health, controlled waters or the wider environment occur, no development shall take place until a detailed remediation scheme has been submitted to and approved in writing by the Mineral Planning Authority. The scheme must include an appraisal of remediation options, identification of the preferred option(s), the proposed remediation objectives and remediation criteria, and a description and programme of the works to be undertaken including the verification plan.

16. Should a remediation scheme be required, the approved strategy shall be implemented and a verification report submitted to and approved in writing by the Mineral Planning Authority, prior to the development (or relevant phase of development) being brought into use.

17. In the event that contamination is found at any time when carrying out the approved development that was not previously identified it must be reported immediately to the Mineral Planning Authority. Development on the part of the site affected must be halted and a risk assessment carried out and submitted to and approved in writing by the Mineral Planning Authority. Where unacceptable risks are found remediation and verification schemes shall be submitted to and approved in writing by the Mineral

Planning Authority. These shall be implemented prior to the development (or relevant phase of development) being brought into use. All work shall be undertaken in accordance with current UK guidance, particularly CLR11.

Stand-off Distances

18. A limestone buffer of no less than 29 metres at ground level and 90 metres at base level shall be maintained at all times between the former landfilled quarry and the permitted development.

19. Notwithstanding condition 9 of this planning permission, there shall be no quarry blasting undertaken within 54 meters of the Northern Gas Network (or any subsequent operating body) high pressure gas pipeline intersecting the application site. Ground vibration as a result of blasting operations shall not exceed a peak particle velocity of 50 mm/sec for all blasts as measured at a location immediately adjacent to the pipeline.

Soil Movements

20. The stripping, movement and respreading of soils shall be restricted to occasions when the soil is in a suitably dry and friable condition and the ground is sufficiently dry to allow passage of heavy vehicles and machinery over it without damage to the soils and the topsoil can be separated from the subsoil without difficulty. Soil stripping shall overwise be undertaken in accordance with the Institute of Quarrying (IQ) Good Practice Guide for Handling Soils in Minerals Workings (2021).

Mineral Extraction

21. Any field conveyor system to be used on site shall be enclosed throughout operation and be well maintained with any spillages promptly dealt with.

Lighting

22. Prior to the installation of any new external lighting at High Close Quarry details of a proposed lighting scheme should be submitted to the Mineral Planning Authority. The scheme should include details of the:
    a. Proposed lighting regime;
    b. Number and location of proposed luminaires;
    c. Luminaire light distribution type;
    d. Lamp type, power and peak wavelength;
    e. Mounting height, orientation direction and beam angle;
    f. Details any cowling or other measures to prevent light out spill; and,
    g. Type of control gear.

Access and Transport

23. No development shall take place until the new access onto the B5301 at Parsonby Brow, which is the subject of a separate planning permission [*reference to be added once available*], has been completed in accordance the approved details.

24. All vehicles used to transport mineral from the site onto the public highway shall be securely sheeted prior to exiting the site so as not to deposit any mineral upon the highway.

25. Measures shall be employed to ensure all vehicles leaving the site (with the exception of cars) shall not deposit mud, water or other material from the site onto the public highway. The measures shall be employed throughout the operational life of the site. Any mud, dust or other materials which are deposited on the highway from the site shall be removed in a timely manner.

26. No Heavy Goods Vehicles (HGVs) shall arrive or depart the site by travelling along the B5301 through Parsonby and Plumbland. All HGVs shall enter/exit the site via the new site access onto the B5301, travelling to/from the south on the B5301 towards the A595, unless there are any temporary road closures. A sign advising all drivers of the route to be taken for entering and exiting the site shall be erected at the site entrance and thereafter maintained for the duration of the development hereby permitted.

Landscape and Ecology

27. No ground clearance, tree works, or soil stripping shall take place until a Landscape and Ecological Management Plan (LEMP) addressing landscape and biodiversity protection, enhancement, and management during the continued extraction of limestone hereby permitted has been submitted to the Mineral Planning Authority. The issues which shall be addressed in the LEMP include:
    - I. Identification and evaluation of the landscape and ecological features to be managed;
    - II. Aims and objectives of management on the site;
    - III. Measures to be taken to protect habitat and species present on site;
    - IV. Details of habitat creation as shown on the approved drawing: [restoration masterplan], comprising phasing and method statements for the creation, establishment, and aftercare management of each habitat type to include:
        - a. Woodland and hedgerows
        - b. Calcareous grassland
        - c. Bat mitigation measures before, during and after tree removal
        - d. Wetland habitats including marginal aquatic vegetation

V. A timetable detailing:
    a. The carrying out of all habitat protection and creation measures,
    b. The implementation of habitat and species management for the duration of limestone extraction hereby permitted,
    c. Details of the annual review and update of the LEMP.

VI. A clear detailing of legal, financial and management responsibilities relating to the LEMP which will ensure the successful completion of its aims and objectives.

The development shall be carried out in accordance with the approved LEMP including any revisions as agreed in writing by the Mineral Planning Authority thereafter.

Historic Environment

28. No ground clearance or disturbance of the ground or soils, except for advance planting, shall take place within High Close Quarry until the applicant has secured the implementation of a programme of archaeological investigation, observation and recording in accordance with a Written Scheme of Investigation (WSI) which has been submitted to the Mineral Planning Authority. The scheme shall include a watching brief during topsoil stripping. The approved development shall be carried out in strict accordance with the approved scheme.

Aftercare and Restoration

29. The site shall be progressively restored in accordance with the approved restoration scheme. As part of the final restored surface of each phase there shall be no material injurious to plant life; no wire rope, cable, or other similar unnatural manmade objects; and the slopes of the restored areas shall be graded to a reasonable level but un-compacted surface what will enable the land to be brought to a standard reasonably fit for its restored use.

30. At least once each year during the aftercare period there shall be a formal review, under the provisions of Section 72(5) of the Town and Country Planning Act 1990, to consider the operations which have taken place on each restored phase and to agree a programme of management for the coming year which shall be adhered to by the operator. The parties to be invited to attend this review shall include the mineral operator, the Mineral Planning Authority, owners and occupiers of the land and the Department for Environment, Food and Rural Affairs. At least 2 weeks before the date of each review the operator shall provide all people attending the meeting with a record of the management

and operations carried out on each phase during the period covered by the review and a proposed programme of management for the coming year.

Cessation of Operations

31. In the event that the winning and working of mineral permanently ceases prior to the full implementation of the approved scheme then a revised and detailed scheme for the restoration, aftercare and timescales for the completion of the restoration works, shall be submitted for approval by the Mineral Planning Authority within 3 months of the cessation of working. The site shall thereafter be fully restored and aftercare carried out in accordance with the approved scheme.

    For the purpose of this condition, permanent cessation means that no winning or working of minerals has taken place to a substantial extent for a period of two years, and there is no intention to resume.

APPENDIX 13:
UNITED UTILITIES (UU) ASSETS CONFIRMATION

United Utilities Water Limited
Developer Services & Metering
2nd Floor, Grasmere House
Lingley Mere Business Park
Lingley Green Avenue
Warrington
WA5 3LP

Planning.liaison@uuplc.co.uk

Cumbria County Council
County Council Offices
Kendal
LA9 4RQ

Your ref: 2/19/9010
Our ref: DC/19/4556v3
Date: 14-MAY-20

Dear Sir/Madam,

Location : High Close Quarry, High Close Farm, Plumbland, Aspatria, Wigton, CA7 2HF
Proposal : Application For New Planning Conditions Under Environment Act 1995 For Dormant Minerals Planning – Additional info

Further to United Utilities' previous communication dated 26th March, our Principal Geotechnical Engineer advises the applicant has met our current requirements for vibration monitoring for the Service Reservoir.

When work commences, we will require that a programme of blast monitoring is implemented to determine compliance with the calculated vibration levels in line with the submitted Assessment of Environmental Impact of Blasting at High Close Quarry (Ref.R20.9449/6/DW) dated 07 May 2020 undertaken by Vibrock Limited.

We therefore request the following planning condition is attached to any subsequent approval:

Condition 1

The quarrying operations hereby approved, shall be carried out in accordance with principles set out in the submitted Assessment of Environmental Impact of Blasting at High Close Quarry (Ref.R20.9449/6/DW) dated 07 May 2020 undertaken by Vibrock Limited, which requires a programme of blast monitoring to be implemented for the duration of the operational life of the development to determine compliance with predicted vibration levels.

Reason: To ensure that the vibrations from the quarry working operations do not result in damage to adjacent structures or uses.

Yours faithfully

Gemma Gaskell
United Utilities
Developer Services and Metering

APPENDIX 14:
NORTHERN GAS NETWORKS CONFIRMATION OF BLASTING REQUIREMENTS

Peter
Hope you are all well

<u>Blasting Stand - Off Distance Northern Gas Objection: Planning Application 2/19/9010 + 9011</u>
<u>High Close Quarry, High Close Farm, Plumbland, Aspatria, Wigton, CA7 2HF</u>

We have now received the assessment we commissioned in relation to the blasting report you provided (your doc:- Vibrock: R18. 9449 / 2/ DW).

After deliberating on its contents, we are agreed that a stand off distance of **<u>54 metres</u>** is acceptable.

This is based on the results we have received and the premise that, given your proposed blasting parameters, at this distance, the vibration levels experienced by our pipeline should not be higher than 50 mm/s.
However as part of our agreement, we would like the quarry operators to collect blasting data at our pipeline, at an early stage in the works, in order that this supposition can be verified.
We would also like this vibration level to be monitored periodically as the workings approach the easement, for verification purposes.
(In general, our policy is that blasting vibration monitoring need only be carried out where the expected levels are in excess of 50mm /s at the pipe).

Hopefully you are amenable to the above and thus, please will you indicate your agreement or otherwise to this parameter.

Going forward, I now think that, if this item is agreed by yourselves, then we are in a position to withdraw our objection.

Hope this is acceptable and best wishes.

Donald Gilbank

Network Officer (Pipeline Protection)
Northern Gas Networks
[redacted]
www.northerngasnetworks.co.uk
facebook.com/northerngasnetworks
twitter.com/ngngas
[redacted]