Lomond Banks

EIA Report Volume 1

On behalf of **Flamingo Land Ltd.**

Project Ref: 332010549| Rev: A | Date: April 2022

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1 Introduction

1.1 Introduction

1.1.1 This Environmental Impact Assessment Report (EIAR) has been prepared by Stantec UK Ltd (Stantec) on behalf of Flamingo Land Ltd ('the Applicant') to accompany an application for planning permission in principle (PPiP) for the erection and operation of a proposed tourism and leisure-led mixed-use development ('the proposed development') on land at West Riverside and Woodbank House, Balloch ('the site'). The development of both areas of the site is collectively known as 'Lomond Banks'. The PPiP application and this EIAR are submitted to the Loch Lomond and the Trossachs National Park Authority (LLTNPA) as the relevant Determining Authority. Details of the project team are provided in **Section 1.8** below.

1.2 Purpose of EIAR

1.2.1 The purpose of this EIAR is to report the findings of an Environmental Impact Assessment (EIA) for the proposed development. In doing so, this EIAR identifies the likely environmental effects of the proposed development during both the construction and operation phases. The EIAR has been prepared in accordance with the Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017 as amended ('the EIA Regulations') that are applicable to the determination of the PPiP application for the proposed development.

1.3 The Site

1.3.1 The proposed development site measures c.18.9ha of land, situated to the north of the town of Balloch at the southern tip of Loch Lomond. The proposed site contains two distinct areas, known for the purposes of this EIAR and the PPiP application as West Riverside and Woodbank House respectively. West Riverside encompasses the south-western bank of the River Leven at its confluence with Loch Lomond and extends to the eastern boundary of Drumkinnon Wood. Woodbank House comprises the remains of the Grade A Listed Woodbank House Hotel and its associated structures and grounds.

1.3.2 A detailed description of the proposed site and surrounding area is provided in **Chapter 2** of this EIAR along with a Site Location Plan provided as **Appendix 2.2** of **Volume 2 – Appendices**.

1.4 The Proposed Development

1.4.1 The site at West Riverside and Woodbank House offers a significant opportunity for a tourism, leisure and recreation-based development on the doorstep of one of Scotland's key visitor destinations, Loch Lomond.

1.4.2 The proposal aims to create a quality, accommodation-led destination comprising of hotel and lodge accommodation along with family orientated accommodation and leisure activities. Details regarding the rationale for the proposed development at this location is provided within **Chapter 2** of this EIAR and the associated Planning Statement.

1.4.3 The proposed development comprises the erection and operation of a tourism, leisure and recreation led mixed-use development, including:

- Refurbished tourist information building;
- 60-bedroom apart-hotel;
- 32-bedspace budget hotel;
- Up to 127 self-catering lodges of various sizes;
- Reconstruction and refurbishment of Woodbank House to provide up to 15 Self-catering apartments;

- Reconstruction and refurbishment of the attendant structures at Woodbank to provide up to 6 self-catering units;
- Leisure pool / water park / spa facility;
- Water sports hub;
- Water sports equipment storage building;
- Restaurants / café / retail areas;
- Craft brewery including pub;
- Visitor reception area and hub building including indoor attractions;
- External activity areas including event/performance areas, children's play areas, picnic and barbeque areas;
- Monorail;
- Staff service and welfare accommodation;
- Associated parking, landscaping and infrastructure development works; and,
- Access from the surrounding road network including Ben Lomond Way and Pier Road.

1.4.4 The proposed development includes the retention of the Grade A Listed Woodbank House. The conservation and redevelopment of the listed structures within the site will be subject to future applications for Planning Permission and Listed Building Consent (LBC).

1.4.5 As the applicant is seeking PPiP, the proposed development comprises a suite of key parameters within which the detailed design of the proposed development will be finalised at the detailed design stage. The final design should remain within these key parameters and ensures the likely 'worst case' effects have been considered when assessing the environmental impact of the proposal.

1.4.6 A detailed description of the proposals key parameters is provided in **Chapter 2** of this EIAR. This is supported by a Parameters Plan, provided as **Appendix 2.1** in **Volume 2 – Appendices**. This is also the key plan for which PPiP is being sought. Other plans submitted within this EIAR and the PPiP application are indicative and provided for illustrative purposes only.

1.5 Terms and Definitions

1.5.1 For ease of reference, the following terms have been used in the EIAR:

- The site – the area within the PPiP application boundary which this EIAR relates to, as outlined in red on the Site Location Plan (**Figure 2-1**) within Volume 2 – Technical Appendices;
- West Riverside and Woodbank House – the two distinct areas of land which together comprise the site;
- The proposed development – the erection and operation of a tourism and leisure-led mixed-use development as summarised in Section 1.4 above and detailed within **Chapter 3** of this EIAR;
- The Applicant – Flamingo Land Ltd;
- The PPiP application - the application for planning permission in principle being submitted on behalf of the Applicants for the proposed development; and,
- The EIA Regulations – the Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017 as amended.

1.6 The EIAR and Related Documents

1.6.1 This EIAR presents the findings of an EIA undertaken for the proposed development in accordance with the Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017 as amended, referred to as 'the EIA Regulations'.

1.6.2 Running concurrently with the design process the EIAR has sought to:

- Identify the likely environmental effects of the proposed development;
- Define appropriate design and construction measures and good practice to mitigate likely significant adverse environmental effects and maximise opportunities for environmental enhancements resulting from the construction and operation of the proposed development; and,
- Determine the significance of the likely residual environmental effects from the proposed development remaining identified mitigation and enhancement measures have been taken into account.

1.6.3 The ES comprises the following volumes:

- **Volume 1** – Main Report;
- **Volume 2** – Appendices; and,
- Non-Technical Summary (NTS).

1.6.4 The other principal documents submitted with the planning application include:

- Drawings (illustrative);
- Design & Access Statement;
- Pre-Application Consultation Report (PAC);
- Planning Statement;
- Transport Assessment;
- Flood Risk Assessment;
- Drainage Assessment;
- Topographical Plan;
- Structural Inspection Report Woodbank House & Stables; and,
- Conservation Inspection Report.

1.7 Stakeholder Consultation

1.7.1 A programme of consultation has been undertaken and it has informed the design of the proposed development and the EIA reported in this EIAR:

- Following a request submitted by Stantec on behalf of the Applicants, a formal EIA scoping exercise was co-ordinated by LLTNPA in Summer 2020 seeking the views of consultees (statutory and non-statutory) regarding the required scope of the EIA for the proposed development. The resulting EIA Scoping Opinion, issued by the LLTNPA in October 2020 has guided the preparation of this EIAR and is provided in full as **Appendix 3.1** in **Volume 2 – Appendices**;
- Post-scoping consultation has been undertaken with individual consultees to clarify points noted within LLTNPA's EIA Scoping Opinion, to inform the emerging layout design of the proposed development and agree the detailed scope of the assessment presented in this EIAR. Details of these consultations are provided in **Subsection 3 – Methodology** of each assessment presented in **Chapters 5 – 14** of this EIAR; and
- In addition, a programme of public consultation has been undertaken, pursuant to the pre-application consultation requirements prescribed within Town and Country Planning (Development Management Procedure) (Scotland) Regulations 2013 for all proposed 'major' developments, of which the proposed development is one. Full details of this pre-application consultation and how it has informed the layout design of the proposed development are provided within a separate **Pre-Application Consultation (PAC) Report** prepared by Stantec on behalf of the Applicants. Relevant environmental issues raised through pre-application consultation activities are however addressed within the assessments presented in **Chapters 5 – 14** of this EIAR.

1.8 Project Team

1.8.1 The organisations involved in the preparation of this EIAR and PPiP are listed below:

- **Stantec** – EIA Co-ordination, Planning, Noise & Vibration. Air Quality, Ground Conditions & Geology, Water, Hydrology & Flooding, Traffic & Transport, Socio Economics, Tourism, Recreation & Access;
- Applied Ecology – Ecology;
- **Julian A Morris** - Trees & Woodland;
- **Gillespies** – Landscape and Visual Impact; and,
- **Headland Archaeology** – Archaeology & Cultural Heritage.

1.8.2 The wider project team involved in the preparation of the PPiP application for the proposed development also includes:

- Anderson Bell + Christie Architects – Project Architects;
- Stantec – Planning Agent, Civil Engineering, Site Investigation (SI) Co-ordination, Pre-Application Consultation;
- Tiger Bond – Public Relations;
- Streets UK - Community Engagement; and,
- Cowal Design – Engineering review.

1.8.3 Full details of the project team are provided in **Appendix 1.1**.

1.9 Structure of the EIA Report

1.9.1 The remainder of this EIAR is structured as follows:

- **Volume 1** – Main Report:
- **Chapter 2:** detailed description of the site and the surrounding area; the proposed development, including infrastructure and the consideration of alternatives;
- **Chapter 3:** provides the methodology and assessment methods used to undertake the EIA;
- **Chapter 4:** summarises the planning and policy context to the proposed development;
- **Chapters 5 to 14:** comprise the technical assessment chapters which document the aspects of the environment likely to be significantly affected by the proposed development and describes the likely significant effects of the proposed development (Ecology; Trees & Woodland; Noise and Vibration; Air Quality; Water, Hydrology and Flood Risk; Ground Conditions and Geology; Landscape and Visual; Traffic & Transport; Archaeology & Cultural Heritage; Socio-economics, Tourism & Recreation);
- **Chapter 15:** provides an assessment of impact interactions;
- **Chapter 16:** provides a consolidated schedule of all identified mitigation measures and monitoring requirements; and,
- **Chapter 17:** provides a glossary of terms.
- **Volume 2** –Technical Appendices (**1.1 to 14.3**); and,
- Non-Technical Summary (NTS).

2 Site and Proposed Development

2.1 Introduction

2.1.1 This chapter outlines the key environmental characteristics of the site and the surrounding area which have informed the EIA being undertaken for the proposed development. Details of the characteristics and sensitivities of the individual receptors which have been identified within relevant Study Areas and used to assess likely environmental effects from the proposed development are then provided in **Subsection 4** of **Chapters 5 – 14**.

2.2 The Site

Site Overview

2.2.1 A high-level description of the West Riverside and Woodbank House areas of Lomond Banks is provided below. Further details regarding individual potential receptors and sensitive areas within the site are identified within the **Baseline sub-section** of each technical assessment presented in **Chapters 5 – 14**.

Site Location and Context

2.2.2 The proposed site is located to the north of Balloch, and it contains two distinct areas, known respectively as West Riverside and Woodbank House. The site is referred to in full as 'Lomond Banks. It is approximately 18.9ha of land, at the southern tip of Loch Lomond. A Site Location Plan, showing the PPiP application red line boundary delineated in red and other land under the control of the applicant in blue, is provided within **Appendix 2.2**.

West Riverside

2.2.3 The West Riverside site is bounded by the River Leven to the East, Loch Lomond Shores and Loch Lomond to the North, Old Luss Road and Ben Lomond Way to the west and Balloch Road and the houses in Clairinsh to the South.

2.2.4 The West Riverside area is heavily influenced by the immediately adjacent Drumkinnon Woods and other pockets of landscaped woodland, amenity areas and car parks are in the north of the site and to the east of the existing Loch Lomond Shores complex. The site is therefore constrained to the north and east by the River Leven, Drumkinnon Bay and by Loch Lomond itself.

2.2.5 West Riverside is a short walking distance from Balloch Train Station – which currently provides a half hourly service to Glasgow and Lanarkshire on the North Clyde line. The station is limited in terms of size/scale, covered waiting area and passenger facilities, and only one platform.

2.2.6 The John Muir Way runs through the proposed site. The site is also situated close to National Cycle Route 7.

2.2.7 An oil pipeline operated by INEOS runs east-west through the northern portion of the West Riverside area of the site parallel with Ben Lomond Way. The exact location of the route is visible via pipeline markers and two fenced off areas in the north east near the junction of Ben Lomond Way and Pier Road – these are valve gear / headworks associated with the pipeline. The pipeline then turns north to the west of Loch Lomond and does not intrude into the Woodbank House area.

Woodbank House

2.2.8 Woodbank House comprises the remains of the A Listed Woodbank House Hotel, outbuildings and gardens including estate walls. The area is situated immediately to the west of Old Luss Road and approximately 500m east of the A82.

2.2.9 The buildings which comprise this former hotel are in a ruinous state as a result of two fires (at the main hotel building) and subsequent dereliction. The land and gardens surrounding the house consist of woodland and slope steeply upwards from the Old Luss Road towards the A82.

To the front of the Woodbank House, between it and the Old Luss Road, is an area of open grassland, currently used for grazing.

Access

2.2.10 Access is via several existing minor roads running through the site including Pier Road and Ben Lomond Way. These connect to Balloch Road and a number of roundabouts linking motorists form the A811 Stirling Road and the A82 trunk road network.

2.2.11 The A82 provides the principal access route to the west of Loch Lomond, other parts of the Loch Lomond and The Trossachs National Park, Argyll & Bute and the North West Highlands. This trunk route is strategic in nature and is maintained by Transport Scotland.

2.2.12 The site is a short walking distance to Balloch Train Station, which at present provides a half hourly service to Glasgow and Lanarkshire on the North Clyde line. The station is limited in terms of size/scale and has a limited covered waiting area and passenger facilities, with only one platform.

2.2.13 The site is situated very close to National Cycle Network Route 7 and the John Muir Way. These established routes will be secured and proposed to be enhanced by the development to ensure that connections from these routes are utilised and enhanced.

Environmental Characteristics

West Riverside

2.2.14 The West Riverside area is immediately east of Drumkinnon Woods. This semi-natural woodland is an undulating landform and is dissected by footpaths. The woodland is bounded to the west and north by roads accessing Loch Lomond Shores and the pier. Part of the woodland is designated as Ancient Woodland (long-established of plantation origin). The woodland supports a range of flora and fauna.

2.2.15 SEPA's Indicative Flood Maps indicate that the northern part of the site surrounding Balloch Pier and the western banks of the River Leven running through the site are located within the 1 in 200-year return period flooding envelope (medium likelihood of flooding). However, a flood study of the river undertaken by Jacobs[1] which provides a more detailed outline of the modelled flood extents along the river highlights that the northern part of the site from the existing roundabout on Pier Road and above, would in fact be inundated in the 1 in 200-year return period event, and more substantially in the 1 in 500-year return period event. Only a small strip of land along the banks of the River Leven through the site would be affected by flooding.

Woodbank House

2.2.16 The Woodbank House area of the site is not indicated as susceptible to river flooding on SEPA's indicative flood maps. There are areas shown as being at potential risk of surface water flooding that coincide with the two small watercourses running through this area from the hills to the west and into Loch Lomond.

Existing Land Uses and Activities

2.2.17 **Table 2-1** below identifies all existing land uses and activities known to be present either within the site or along its boundaries. In accordance with the embedded mitigation set out in **Section 2.11**, continuity of access to these receptors is proposed to be maintained throughout the construction and operational phases of the development.

Table 2-1: Existing Land Uses and Activities Within the Site

Receptor Type	Existing Uses and Activities
Recreational routes	Loch Lomond Shores Walk, John Muir Way, Three Lochs Way, National Cycle Route 7, West Loch Lomond Cycle Path, Regional Cycle Route 40.
Tourism, Recreation and Leisure	Maid of the Loch, Sweeney's Cruises, Tourist Information Centre (Balloch VisitScotland Centre), Tour Boats, Sealife Centre, Loch

[1] Jacobs 2009, River Leven Flood Study Review & Update of Original Work

Receptor Type	Existing Uses and Activities
	Lomond Bird of Prey Centre, TreeZone aerial adventure course, Pier head users (swimming, fishing, canoeing, rowing, water-skiing, bike & boat hire etc).
Other	Loch Lomond Shores including all operators currently within complex, National Park ranger's office at Pierhead.

2.3 The Surrounding Area

2.3.1 Given the site's location within the National Park, it is proximate to numerous tourism and recreation resources/receptors, including: Loch Lomond, Ben Lomond, Luss, River Leven and Balloch itself (with particular reference to visitor-related business activity and the accommodation sector). The closest visitor attractions to the site are:

- Loch Lomond Shores, a retail and leisure development situated immediately to the north west;
- The Loch Lomond Steamship, berthed at Balloch Pier within the northern extent of the development site;
- Loch Lomond Birds of Prey Centre, located within the Loch Lomond Shores complex;
- Balloch Castle and Country Park are situated east of the development site across the River Leven; and,
- Other visitor attractions and tourism developments are located at greater distance within Balloch and along the shores of Loch Lomond.

2.3.2 Relevant environmental characteristics and sensitivities in the surrounding area are identified as potential receptors within the technical assessments presented in **Chapters 5 – 14**.

2.4 Cumulative Development

2.4.1 The EIA Regulations require likely significant cumulative effects from a development proposal in combination with other existing or proposed developments to be described within an EIAR. Details of relevant existing, approved and proposed developments which have been considered in this EIAR are provided below.

2.4.2 All of the selected cumulative developments in **Table 2-2** are located within close vicinity of the site**.** These cumulative developments have been included within cumulative impact assessments provided in **Subsection 10** of each technical assessment presented in **Chapters 5 – 14**.

Existing Development

2.4.3 Existing development is considered as a receptor and/or impact source where relevant within each technical assessment through **Chapters 5 – 14.**

Approved & Proposed Development

2.4.4 **Table 2-2** below identifies the approved and proposed developments which have been considered in this EIAR.

Table 2-2: Relevant Approved and Proposed Developments

Planning Application Reference	Overview
Riverside Leisure Ltd 2021/0146/DET	Replace fixed jetties providing 50 moorings with floating pontoons providing 48 moorings -at River Leven, adjacent to Riverside Boatyard Dalvait Road Balloch.
Balloch Street Design Project	The Balloch Village Plans (Street Design) Project builds on the engagement undertaken through the 'Live in Balloch' Charrette process in February and March 2016.

Planning Application Reference	Overview
Sweeney Cruises 2021/0426/DET	Proposed installation of pontoons West Side of River Leven South of Lomond Road Bridge Balloch.
Lomond Park Hotel 2020/0266/DET	Demolition of hotel and public house and erection of mixed -use development comprising 26 flatted residential dwellings (Sui Generis) with ground floor retail units (Class 1) | Lomond Park Hotel Balloch Road Balloch.

2.5 The Proposal

2.5.1 The proposed development comprises the erection and operation of a tourism and leisure-led mixed-use development at the site, including:

- Refurbished tourist information building;
- 60-bedroom apart-hotel;
- 32-bedspace budget hotel;
- Up to 127 self-catering lodges of various sizes;
- Reconstruction and refurbishment of Woodbank House to provide up to 15 Self-catering apartments;
- Reconstruction and refurbishment of the attendant structures at Woodbank to provide up to 6 self-catering units;
- Leisure pool / water park / spa facility;
- Water sports hub;
- Water sports equipment storage building;
- Restaurants / café / retail areas;
- Craft brewery including pub;
- Visitor reception area and hub building including indoor attractions;
- External activity areas including event/performance areas, children's play areas, picnic and barbeque areas;
- Monorail;
- Staff service and welfare accommodation;
- Associated parking, landscaping and infrastructure development works; and,
- Access from the surrounding road network including Ben Lomond Way and Pier Road.

2.5.2 The proposed development also includes the remains of the Grade A listed Woodbank House and attendant structures. The conservation and redevelopment of the Woodbank House façade and other listed structures within the site will be subject to future applications for planning and listed building consent.

2.5.3 As the Applicants are seeking PPiP rather than full planning permission, at this stage the proposed development comprises a suite of key parameters, within which the detailed design of the proposed development will be confirmed later. This EIA has therefore been undertaken using a 'Rochdale Envelope' approach, with each technical assessment assessing the likely worst-case effects from the construction and operation of the proposed development according to the defined key parameters. These key parameters include land use blocks and maximum building floor areas and heights, as shown on **Appendix 2.1 – Parameters Plan**.

2.6 Key Characteristics of Proposal

Demolition

2.6.1 For the avoidance of doubt, no demolition is proposed as part of the PPiP and has therefore not been assessed in this EIAR.

Tree-Felling

2.6.2 Targeted tree removal is proposed at the pier head area and, following a tree survey, within Woodbank area of the site to remove trees unsuited for long term retention. In other parts of the site, the principle of avoidance of tree clearance has been adopted.

2.6.3 The approach to targeted tree removal and proposed compensatory planting is assessed and detailed fully within the technical assessment presented in **Chapter 6 – Trees and Woodland**.

Buildings

2.6.4 The Parameters Plan (**Appendix 2** within **EIAR Volume 2**) separates the site into five distinct 'Development Zones' (Zones A, B, C, D and E) as well as overarching components. These zones and land uses with associated key parameters as defined on the Parameters Plan, represent the proposed development for the purposes of this PPiP and EIA. Each development parameter is to allow some flexibility in the final design and layout of buildings and structures. The developments zones are as follows:

Table 2-3: Development Zones

Development Zone	Area	Land Use/Class	Floor Space/ Units
Zone A – Station Square	1	Brewery incl. pub -	1,200 sqm inc 300m^2 pub
		Restaurant – Use Class 3	150 sqm
		Budget hotel – Use Class 7	32 bedrooms
		Amphitheatre area	Temporary tent structure
	2	Refurbished tourist office	
		Enhanced public square	
Zone B – Riverfront	3a	Woodland Lodges	42 lodges (max)
		Picnic, BBQ & Play Areas	
		Path Network	
	4a	Managed Woodland with SUDs	2 SUDs attenuation ponds
Zone C - Pierhead	5	Apart Hotel & Restaurant – Use Class 7 & 3	60 bedrooms 150 sqm restaurant
		Water Park – Use Class 11	
		Visitor Hub	Indoor attractions, storage & office
	6	Visitor Attraction & Car Park	
	7	Multi-User Public Realm	
Zone D – Drumkinnon Wood & Bay	8 & 4b	Managed Woodland Area	
	3c	Boathouse equipment storage	95 sqm
	10	Staff & Service area	
	11	Buffer Zone	12m deep around dwellings at Drumkinnon Gate
Zone E - Woodbank	13	Woodbank House conversion to holiday apartments	15 units (Max)
		Woodland Stable and Bothy converted to self-catering holiday properties	6 units (max)

Development Zone	Area	Land Use/Class	Floor Space/ Units
	3d	Lodges within existing field	37 lodges (max)
		Lodges within woodland	30 lodges (max)
		Bothies within woodland	17 bothies' (Max)

2.6.5 The siting and detailed design within each zone will be subject to further consideration through the submission of applications for approval of matters specified by condition (AMSC applications) after any PPiP is approved. At this stage, the EIAR does not assess the potential effects from any detailed siting or design.

Other Infrastructure & Structures

2.6.6 In addition, the Parameters Plan also proposes the following uses and structures across the site:

- New car parking 393 spaces;
- Site Vehicular/Boat Access Points (Existing, maintained);
- Pedestrian/cycle linkages;
- Monorail – from Station Square to Pierhead (3.5m high to 5.5m high); and,
- Monorail stations – Station Square & Aparthotel.

Landscaping

2.6.7 A number of general landscape design principles have been developed as part of the landscape strategy that is described within the Design Statement accompanying the PPiP application. These principles seek to guide the implementation of a suitable landscape scheme for the proposed development that protects and enhances the existing landscape.

2.6.8 The proposed development seeks to provide landscape buffers and native planting to help set the development in its locality. Landscape buffers have been set at depths that respond to the adjacent current and proposed future land uses, with larger buffers close to sensitive receptors. For example, a 12m landscape buffer is proposed between the proposed development and the existing Drumkinnon Gate residential area to the south.

Ecology

2.6.9 A range of measures describing key working methods and timings to avoid/minimise ecological effects during construction will be delivered through a Construction Environmental Management Plan (CEMP) and protected species licences (where required) will be overseen by an appointed Ecological Clerk of Works (ECoW). These licences will be obtained in advance of construction, and detailed mitigation measures would be agreed during the licensing process with the respective licensing authority.

Existing Pipeline Infrastructure

2.6.10 The proposed development allows for the INEOS oil pipeline infrastructure (2 main pipes and fenced valve areas) to be retained within the site. A 3m stand-off on each side of the infrastructure have been proposed for health and safety purposes and to allow access for maintenance.

Access and Parking

Vehicular Access

2.6.11 The main access to the site will be via Ben Lomond Way (existing main access to Loch Lomond Shores) and Pier Road, an existing, secondary access to Pierhead, Maid of the Loch and slipway activities. Woodbank House is accessed via Old Luss Road and the reformation of an existing priority access junction.

2.6.12 Pier Road will be used for access to the newly proposed car park to the west of Pier Road, which is intended to cater for the land uses included within the Zone A - Station Square

proposals. Ben Lomond Way will be promoted as the main access to the wider site to ensure strategic and site-bound traffic is removed from the local road network.

2.6.13 A signage and wayfinding strategy will be developed for the wider site at the detailed design stage. It is expected that a combination of enhanced signage and Variable Message Signing (VMS) will need to be installed at key approaches to the site, as well as internally within the site, to ensure effective vehicular movement for internal destinations and appropriate directions to the relevant car parking areas.

2.6.14 For accommodation land uses, except for the Woodbank House site, the arrivals and parking for this element can be managed from the point of booking, whereby visitors can be advised of the intended arrival and check-in arrangements. It is intended that parking for the visitor accommodation will be segregated from the parking for other land-uses and will be remote from the accommodation. Small buggies will be used to transport visitors and baggage to their holiday accommodation as to reduce unnecessary vehicular trips.

2.6.15 No new internal access roads are proposed to be provided and it is intended that the proposed development will be fully accessible by sustainable modes of transport.

Pedestrian and Cycle Path Networks

2.6.16 The existing pedestrian and cycle network as it exists through the West Riverside site will be retained and enhanced as necessary to provide full connectivity to the wider network as well as new internal elements of the site. Further to this, bike hire is proposed as part of the enhanced Tourist Information Office within Station Square, which will further support internal movements by bike. It is also intended that the existing cycle and walking routes will be widened (where possible) to SUSTRANS standards (3m) for shared walking and cycling.

2.6.17 Throughout the Station Square, Riverfront and Drumkinnon areas, the existing path network including the John Muir Way walking and cycling route will be retained and enhanced as appropriate. The existing north-south foot and cycle paths through the Riverfront Zone, will be enhanced with a series of east-west paths increasing access opportunities between Pier Road and the Riverfront area.

2.6.18 The existing foot and cycle way from Loch Lomond Shores to Old Luss Road will be extended to provide a shared foot and cycle way, compliant with technical standards, on the north side of the road, providing a direct walking and cycling link between the two proposed development sites.

2.6.19 For Woodbank House site, paths and cycleways are intended to be developed in accordance with Designing Streets Principles and will provide a continuous internal path network, and a direct link with Upper Stoneymollan Road/ John Muir Way.

Rail

2.6.20 The proposed development includes a monorail facility between Zone A (Station Square) and Zone C (Pierhead). This will improve connectivity between Balloch Village and Loch Lomond Shores, through a direct and convenient means of transport.

2.6.21 Recent enhancements by SUSTRANS on Balloch Road between the Station Square development (Zone A) and Balloch Railway Station, will help deliver enhanced access between the station and the proposed development site as well as the wider village of Balloch. Allowance has been made within the parking provision to maintain 44 park and ride spaces currently located adjacent to the visitor centre. These will be relocated as part of the development.

Bus

2.6.22 The existing bus service that operates through Loch Lomond Shores via Ben Lomond Way is presently intended to remain in operation with the proposed development, albeit discussions will be held with the operator once layout designs are progressed further.

Car Parking

2.6.23 Proposed parking arrangements have been outlined below. The development will seek to accord to the adopted parking standards at the time of AMSC applications. Parking provision for the site is summarised below in **Table 2-4**.

Table 2-4: Parking Provision

Development Zone	Land Use	Parking Provision
Station Square, Pier road and Riverside	Brewery incl. pub	132 spaces
	Restaurant	
	Budget outdoor hotel	
	WDC park and Ride (44 spaces)	
	Woodland Lodges (Riverfront)	
	Apart Hotel & Restaurant	99 spaces
	Water Park	
Ben Lomond Way	Staff & Service area	35 spaces
Woodbank	Woodland Lodges	127 spaces
	Woodbank House	24 spaces
Total		**393 spaces**

2.6.24 For the purposes of the PPiP application, it has been assumed that the development proposals demonstrate self-sufficiency with respect to vehicle parking and there is no reliance on existing parking at the Loch Lomond Shores car parks (main or overspill).

2.6.25 The parameters plan indicates total parking provision of 393 new parking spaces. As the detail of the proposals progress, it is anticipated that parking locations will be re-configured to allow effective, efficient, and sustainable vehicle and access operations across the shared sites. This will be form part of any detailed design applications.

2.6.26 Once constructed, the proposed development will operate as a tourism and leisure business centred around a range of on-site visitor accommodation facilities. As shown on **Figure 2-1 – Parameters Plan**, proposed food and drink, retail, leisure and entertainment uses will be clustered within Zone A – Station Square and Zone C – Pierhead, with visitor accommodation located across all zones. Additionally, a suite of management and entrance buildings will be located in Zone D – Drumkinnon Wood & Bay, adjacent to Loch Lomond Shores' existing overspill carpark (which itself lies outwith the site and not be subject to development through this PPiP application). Zone D will also include sensitively designed and sited forest adventure activities, as well as a dedicated area for site deliveries and operational staff parking.

2.6.27 All proposed accommodation will be used for short term visitor/holiday purposes only. This visitor accommodation will therefore not give rise to any additional pressure on social or community infrastructure including healthcare and education infrastructure.

2.7 Materials and Natural Resource Usage

2.7.1 The proposed development will utilise land and construction materials including bricks, roofing tiles, cement, concrete, timber, asphalt, piping, etc). Soil (reused from onsite resources wherever practicable) and seeded grass or turf will also be used for landscaping purposes. Once occupied the proposed development will use domestic energy and utilities infrastructure. Soil movement will be undertaken with reference to best practice guidelines available in the Construction Code of Practice for the Sustainable Use of Soils on Construction Sites (Defra, 2009).

2.7.2 Where possible, excavated material will (depending on type) be used to backfill excavations and for site re-profiling purposes where appropriate. It is not expected that any material will be unsuitable for re-use in this way, though in the unlikely event that such material arises it will be disposed off-site in line with relevant waste disposal regulations.

2.8 Expected Residues, Emissions and Waste

2.8.1 Construction waste is expected to be restricted to normal non-hazardous materials such as off-cuts of timber, bricks, wire, fibreglass, cleaning cloths, paper, materials packaging and similar materials. These will be sorted and recycled or appropriately disposed of by the appointed contractor.

2.8.2 Once operational, a commercial waste management and recycling contractor will service the proposed development. The proposed development will be designed to accommodate heavy goods vehicles (HGV) in areas where access is required for waste collection and deliveries. The quantity and type(s) of waste during operation cannot be predicted at this stage, as this will depend on operational factors, visitor numbers and waste management legislation.

2.9 Proposed Construction Works, Programme and Management Arrangements

Construction Works and Programme

2.9.1 At this stage it is anticipated that construction will take approximately six years and the key construction activities are likely to include:

- Vegetation clearance, earthworks and soil preparation to prepare areas of the site for construction activities;
- Construction of infrastructure including internal access routes, drainage pipes and SUDS attenuation basin(s);
- Formation of public open space, with associated landscaping;
- Targeted tree removal and installation of forest lodges and path networks;
- Construction of building foundations (where required), structure, cladding and glazing and internal walls and partitions;
- Installation of fixtures, fitting and building services;
- Utility diversions, upgrades and connections as required; and,
- External landscaping, highway and drainage works.

2.9.2 A Construction Environmental Management Plan (CEMP) will be implemented to reduce the risk of any likely significant adverse effects on environmental receptors as a result of construction activities. To help minimise disturbance to the local residents and businesses adherence to the CEMP will be overseen by an appointed Ecological Clerk of Works (ECoW).

2.10 Proposed Mitigation and Enhancement

Embedded Mitigation

2.10.1 In line with EIA best practice, an overarching suite of mitigation measures and commitments is proposed to be incorporated from the outset to both address any adverse effects and enhance its environmental performance. These are termed embedded mitigation measures. They are as follows:

Construction Phase

- CEMP:
    - Development and implementation of measures relating to: construction traffic routing, site access/deliveries, parking, contractor management, parking, fuels and materials storage, standard dust and noise suppression techniques and standard pollution presentation and control techniques. These measures will be set out within a Construction Environmental Management Plan (CEMP). Any other measures to be included in the CEMP will be identified as 'further mitigation' (not embedded) through the EIA;

- Prior to commencement any construction activities within a 5m corridor of waterfronts will be subject to specific consideration within the CEMP and agreed with the LLTNPA;
- An Environmental Clerk of Works (ECoW) will be appointed to ensure that the CEMP and associated mitigation measures are implemented effectively;
- A pollution prevention and response plan will be set out in the CEMP. This will provide site spill response procedures, emergency contact details and equipment inventories and their location. All staff will be made aware of this document during site induction. A copy will be available in the site office at all times;
- Adoption of standard construction industry working hours for noise generating activities;
- A contaminated hotspots plan and procedure for managing unexpected contamination will be produced;
- Settlement tanks/beds should be utilised to prevent increased suspended solids entering Loch Lomond or River Leven via surface water run-off during rainfall;
- A 3m exclusion zone will be adopted either side of INEOS gas pipelines in the site;
- Risk Assessments and Method Statements (RAMS) will be prepared. Construction/ground workers should take cognisance of any contamination reported and will be required to work in accordance with the RAMS. Appropriate personal protective equipment (PPE) to be worn by all site workers (as specified in RAMS);
- Informing site workers of any contamination on the site and the potential health effects from exposure through site induction and toolbox talks;
- Dust suppression to minimise the air quality effects on offsite users;
- If piled foundations are required, a site-specific risk assessment designed specifically to assess the risks posed by piling should be carried out. If piled foundations are required, the technique used will be selected on the basis of protecting groundwater from contamination. Safe piling techniques should be adopted to minimise risks posed; and,
- All construction work will be undertaken in general accordance with SEPA's Guidance for Pollution Prevention (GPPs).

- Landscape:
  - 12m buffer (i.e., no construction) around the site boundary with residential area of Drumkinnon Gate;
  - Prior to commencement, any construction activities within 5m corridor of waterfronts will be agreed with the LLTNPA;
  - Location of construction compounds and temporary stockpiles in the least visibly prominent locations within the site;
  - Use of well-maintained hoardings and fencing;
  - Protection of all retained vegetation on the site in accordance with BS 5837: Trees in relation to design, demolition and construction;
  - Prevention of damage to landscape features adjacent to the construction plots due to movement of construction vehicles, plant or operatives;
  - Working with existing topography to minimise ground level regrading where possible;
  - Access to all key nodes and routes (formal and informal) through the site are to be maintained during the construction phase. Localised diversions to facilitate construction may occur on land within the applicant's control. Any impacts on

walking/ cycle routes during the construction phase will be short term and localised diversions will be put in place;

- Continued provision of access through parts of the site to existing receptors and land uses as identified in **Chapter 2** Site and Proposed Development and **Chapter 12** Traffic and Transport;
- Design of lighting to avoid unnecessary intrusion onto adjacent buildings and siting construction compounds and machinery to minimise upward and outward lightspill;
- Use of designated construction traffic routes to and from the site in order to minimise visual amenity effects on neighbouring sensitive receptor areas; and,
- Ecological Clerk of Works (ECoW) to work on site with the construction contractor to oversee the management of the risks associated with protecting biodiversity and manage ecological operatives engaged in ecological mitigation activities.

- Ecology, trees and woodland:
  - Safeguarding of identified important trees, including their root systems, from disturbance or loss;
  - Erection of forest lodges on elevated support structures where required to minimise the need for the development of building foundations within woodland areas;
  - Siting and design of forest lodges to be informed by detailed tree surveys of the site, to be undertaken in accordance with relevant British Standards. This siting and design process should:
  - Maintain the integrity of the existing forest habitat network;
  - Target existing open areas where possible by using the completed survey to locate existing glades;
  - Ensure the retention of desirable, native species trees is achieved by maximising the use of glades for lodge positions and by targeting specific survey of trees which surround the chosen areas (to be identified through aforementioned surveys);
  - Use baseline habitat and future targeted tree survey to mitigate any predicted tree loss and disturbance impacts; and,
  - Target opportunities to remove invasive species through construction activities.
  - Commitment to the provision of appropriate compensatory planting to offset the loss of trees in building footprint and working areas within existing woodland (the details of which are considered below and treated as further mitigation and enhancement);
  - Manage extents of invasive species such as rosebay willowherb, Japanese knotweed and bamboo in particular at Woodbank House;
  - Development of path and minor route networks using low impact technology to protect tree roots, soils and surrounding vegetation;
  - Manage existing woodland to improve its age profile, encourage continued biodiversity and preserve its presence in the landscape;
  - Boost ecology and ground flora within woodland by thinning out trees, allowing more sunlight to reach the woodland floor. Management of non-native species;
  - A speed limit of 10mph will be applied to all construction traffic to reduce the risk and frequency of potential collisions, and,
  - Boundary features and fences will be designed to allow roe deer and badgers to move freely where appropriate.

- Heritage:
  - Undertake an agreed programme of archaeological works, as requested by WoSAS, prior to the construction of the proposed development;

- Adherence to relevant HES regulatory and good practice guidance in construction methods;
- Retention of Woodbank House listed building façade as a landmark feature, within a reconstructed building and self-catering apartment development; and,
- Conversion of other listed buildings within the Woodbank House area to self-catering and ancillary uses where practicable and viable.

- Socio-economics, Tourism and Recreation:
  - Access to all key nodes and routes through the site to be maintained during the construction phase. Localised diversions to facilitate construction may occur on land within the applicant's control. Any impacts on walking/cycle routes during the construction phase will be short term and localised diversions will be put in place;
  - Production of an Access Management Plan (AMP), for agreement with LLTNPA in order to manage access through the construction and operational phases;
  - Continued provision of access through the site to existing receptors and land uses; and,
  - Access to tourist information facility maintained whilst refurbishment takes place.
- Pipeline:
  - 3m stand-off zone either side of INEOS pipelines, unless agreed with INEOS;
  - Minimisation of any piling (if required) within 25m of INEOS pipelines, with construction techniques to be agreed through consultation with INEOS if required; and,
  - On-site supervision by INEOS of construction work within 25m of INEOS pipelines.
- Ground Conditions:
  - Additional intrusive site investigation to delineate any contamination and a remediation strategy;
  - Further intrusive site investigation will be undertaken prior to construction within and around the derelict buildings at Woodbank House to determine the potential for contaminants of concern including asbestos and PAHs. If elevated concentration is identified, remediation will be undertaken to remove the contaminated material or lower the concentration of contaminants to a suitable level (i.e. below GAC);
  - Remediation strategy which may include localised excavation of contaminated material and replacement with clean fill/capping material or hardstanding;
  - Gas protection measures (if required) will be incorporated into the design of the proposed development to protect the building structures and human health (future end users); and,
  - Risk Assessments and Method Statements (RAMS) will be prepared. Construction/ground workers should take cognisance of the contamination reported and will be required to work in accordance with the RAMS.
- Hydrology:
  - No buildings within the functional floodplain and finished floor levels of buildings adjacent to the water bodies to be above the 1 in 200yr + climate change peak flood level;
  - Avoid crossings of existing watercourse to prevent pollution;
  - A 5m corridor along waterfronts will be subject to specific consideration with a CEMP; and,
  - Surface water drainage scheme for the proposed development will be designed in accordance with Sustainable Urban Drainage systems (SUDs) principles. The

maximum discharge rate will be equivalent to the greenfield (i.e. pre-development) runoff rates.

- Noise:
  - Stretch of 2m high close boarded timber garden fencing at the garden /terrace boundary of NSR 19.

Operational Phase

- Landscape:
  - 12m buffer around the site boundary with residential area of Drumkinnon Gate;
  - Screening increased around the boundary between woodland and residential area using evergreen native shrubs, to reduce visual effects on nearby residents;
  - Unsightly utilities to be screened and incorporated within the woodland setting;
  - Proposed car parking to be sensitively incorporated into the woodland. Surface materials to be in keeping with the location and context. Additional mitigation measures such as buffer planting to provide natural screening to new car parking;
  - Existing pathways, to be regraded and enhanced with new porous surfacing materials;
  - New woodland planting to be created on the Woodbank House site;
  - Retention of Woodbank House listed building facade as a landmark feature;
  - Continued public access to Drumkinnon Bay waterfront;
  - Continued provision of access through the site to existing receptors and land uses as identified in **Chapter 2: Site and Proposed Development**;
  - Safeguarding of identified important trees within existing woodland areas, as identified in the **Parameters Plan in Appendix 2.1**;
  - Integration of Station Square proposals with Balloch Street Design Project and Sweeney Cruises proposal;
  - Elevated sections of monorail to have sufficient clearance above roads and paths to allow for passage underneath; and,
  - Access to all key nodes and routes will be maintained during operation with the quality of some routes enhanced. Some permanent localised diversions may be required; however, this will be limited to using other land within the applicant's control in order to avoid lengthy or circuitous alterations.
- Ecology:
  - During the design process, various factors were taken into consideration in order to minimise potential impacts on IEFs. These can be summarised as:
  - Exclusion of all previously proposed works from Drumkinnon Wood;
  - Ongoing management and survey of invasive species such as Rosebay Willow herb, Japanese Knotweed and Bamboo in particular on the Woodbank site; and,
  - Commitment to implement a woodland management plan to enhance the quality and composition of existing woodland within the site, particularly of the ancient woodland and those presenting semi-natural characteristics. The details of this plan will be informed by the EIA and relevant design considerations.
  - An Ecological Clerk of Works (ECoW) will oversee all stages of construction, to ensure that good practice measures with regards to ecology are implemented. Other good construction practice measures will be incorporated in the Construction Environmental Management Plan (CEMP) for the Proposed Development. These are summarised as:

- Work areas will be carefully marked out and delimited on the ground, with the assistance of the ECoW, to ensure no extraneous habitat loss. Temporary fencing will be used to ensure that plant and operatives do not encroach further than is necessary into ecologically sensitive areas;
- General good practice measures for working in and near to watercourses and waterbodies will be adhered to, for example, during construction, silt interception traps will be provided to minimise unchecked contaminated run-off. Appropriate temporary drainage solutions must be designed and installed. Detailed drainage designs will require review and approval by the scheme Environmental Manager (and ECoW as required), and appropriate drainage measures will be installed in advance of major ground-breaking works. A pollution prevention plan will be included in the CEMP;
- Fuels and chemicals will be stored securely in the site construction compound;
- Appropriate wash-out facilities will be available for vehicles and machinery;
- Trenches and excavations will be covered at the end of working day, or will include ramps, and stored pipes will be capped, to prevent animal entrapment;
- If construction work is carried out during hours of darkness, machinery and lights will be directed away from watercourses and woodland edges. Use of heavy machinery and pile drivers limited to avoid two hours before and after dawn and dusk within 30 m of watercourses, waterbodies or woodland edges; and,
- A site speed limit of 10 mph for all construction traffic will be in place to protect badger, red squirrel and otter.

- Heritage:
  - Reconstruction and conversion of Woodbank House listed building as a landmark feature for self-catering accommodation.
- Socio-economics, Tourism and Recreation:
  - Employment of local resident workers and delivery of training (e.g. apprenticeships) where possible;
  - Access to all key nodes and routes will be maintained during operation with the quality of some routes enhanced. Some permanent localised diversions may be required within the applicants control in order to avoid lengthy or circuitous alterations;
  - Continued public access to Drumkinnon Bay waterfront and public beach areas at Balloch Pierhead;
  - Development and implementation of Travel Plan (to encourage sustainable travel by visitors and workers); and,
  - Continued provision of access through the site to existing receptors and land uses;
- Pipeline:
  - No ground development within 3m stand-off zone each side of INEOS pipelines, unless agreed with INEOS.
- Hydrology:
  - The proposed surface water and SUDs scheme will require regular maintenance during its operational life. This maintenance will include the regular debris clearing and cutting of grass of surface SUDs features, and the inspection and repairs to underground features if necessary. The responsibility for the maintenance of the drainage network will lie with the organisation that adopts the network.
- Traffic & Transport:
  - Proposed development will be fully accessible by sustainable modes of transport. The existing pedestrian and cycle network through West Riverside will be retained

and enhanced as necessary to provide full connectivity to the wider network and new internal elements of the site. The site will benefit from increased uptake of sustainable modes with walking and cycling the go-to-mode of choice for users of the woodland lodges and overnight accommodation: by leaving cars remote from the lodges will reduce any unnecessary internal car trips;

- Bike hire is proposed as part of enhanced Tourist Information Office at Station Square, which will further support internal movements by bike;
- Whilst the internal layout requires to be developed further as part of subsequent detailed design stages, it is intended that (where possible) the existing cycle and walking routes will be improved/widened to SUSTRANS standards for shared walking and cycling routes;
- Throughout the Station Square, Riverfront and Drumkinnon areas, the existing path network including the John Muir Way will be retained and enhanced as appropriate. Discussions will be held with SUSTRANS when the detail of these routes is considered. The existing north-south foot and cycle paths through the Riverfront Zone, will be enhanced with a series of east-west paths increasing access opportunities between Pier Road and the Riverfront area;
- The existing foot and cycle way from Loch Lomond Shores to Old Luss Road will be extended to provide a shared foot and cycle way, compliant with technical standards, on the north (development) side of the road, providing a direct walking and cycling link between the two sites;
- From the Woodbank House site is intended to be configured in accordance with Designing Streets Principles and will provide a continuous internal path network, a direct foot and cycle link will be provided to the Upper Stoneymollan Road/ John Muir Way; and,
- A signage and wayfinding strategy will be developed for the wider site once clarification on the preferred parking locations for site-based activities and land uses are confirmed. It is expected that a combination of enhanced signage and Variable Message Signing (VMS) will need to be installed at key approaches to the site from both the strategic and local road network, as well as internally within the site, to ensure effective vehicular movement for internal destinations and appropriate directions to the relevant car parking areas.

2.10.2 The embedded mitigation measures of relevance to each technical assessment are listed in **Subsection 6 – Embedded Mitigation** and have been taken account of within the assessments presented in **Subsection 7 – Potential Effects** of **Chapters 5-14**.

Further Mitigation and Enhancement

2.10.3 Further specific mitigation has also been identified where necessary through the EIA process to prevent, avoid, minimise or offset significant adverse effects and to further enhance the environmental performance or wider benefits of the proposed development. This 'further mitigation and enhancement' is identified in **Subsection 8 – Further Mitigation and Enhancement** of **Chapters 5 – 14**.

2.10.4 Embedded mitigation described above, and further mitigation measures proposed is summarised in **Chapter 16 – Schedule of Mitigation and Monitoring.** This will enable LLTNP to secure this mitigation in any PPiP granted for the proposed development.

2.11 Consideration of Alternatives

2.11.1 Paragraph 2 of Schedule 4 of the 2017 EIA Regulations requires an EIAR to provide a description of the reasonable alternatives, which are relevant to the development and its specific characteristics, and an indication of the main reasons for the option chosen, taking into account the effects of the proposed development on the environment.

2.11.2 The nature of certain developments and their location may make the consideration of alternative sites a material consideration. In such cases, the EIAR must record the consideration of alternative sites. More generally, consideration of alternatives (including alternative sites, choice

of process, and construction phasing) is widely regarded as good practice and resulting in a more robust application for planning permission. Ideally, EIA should start at the stage of site and process selection, so that the environmental merits of practicable alternatives can be properly considered. Where this is undertaken, the main alternatives considered must be outlined in the EIAR.

2.11.3 For the purposes of this EIAR, and noting that the site is positively allocated within the LDP for Visitor Experience developments, the only alternatives considered in relation to the proposed development were:

- Different possible formulations of proposed land use zones across the site. The proposed configuration of land use zones has been arrived at following detailed analysis of multiple on-site constraints, including the need to safeguard INEOS pipeline infrastructure and to minimise disturbance to woodland including the adjacent Drumkinnon Woodland. The proposed configuration of land use zones is considered to be optimal in terms of safeguarding environmental and infrastructure constraints whilst enabling the development of a commercially viable tourism, leisure and recreation development.

3 EIA Process

3.1 Introduction

3.1.1 This Chapter describes the approach to this EIA Report, the responses received during the scoping process, and consultations that have been undertaken with key stakeholders and members of the public.

3.2 Overview of EIA

3.2.1 EIA is a systematic procedure that must be followed when determining applications seeking consent for certain categories of project. It aims to identify a project's likely environmental effects, required mitigation measures to reduce the level of or avoid those effects, and assess the residual significance of predicted environmental effects taking account of all proposed mitigation and enhancement measures. This process helps to ensure that predicted effects, and the scope for reducing them, are properly understood by the public and the relevant determining authority (Loch Lomond & The Trossachs National Park Authority) before determination of the proposal.

3.2.2 Within Scotland, the requirements of the European Council Directive 85/337/EEC on the assessment of the effects of certain public and private projects on the environment, as amended by the European Council Directive 97/11/EEC, are transposed in law by The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017 (the EIA Regulations).

3.2.3 An important tenet of EIA is that it is a process culminating in the submission and examination of an EIAR, rather than just a single output in the form of a report. EIA therefore has a number of key characteristics; it is:

- **Systematic**, comprising a sequence of tasks defined both by regulation and best practice;
- **Analytical**, requiring the application of specialist knowledge and skills from environmental sciences and policy;
- **Impartial,** its objectives being to inform decision making and improve the environmental performance of projects rather than being to promote them;
- **Consultative**, with provision being made for obtaining information and feedback from interested stakeholders and relevant consultees; and,
- **Iterative**, allowing opportunities for environmental concerns to be addressed during the planning and design of a project.

3.2.4 Typically, an iterative design process occurs in response to environmental constraints (identified during the EIA process) and other design objectives, taking account of project viability considerations and feedback from relevant consultees. This often results in a development proposal incorporating mitigation measures or design features to avoid, reduce or compensate for potential adverse effects, referred to as embedded mitigation. Additional mitigation is then identified where necessary to reduce or avoid residual significant environmental effects.

3.3 Statutory Provisions

3.3.1 The PPiP application submitted for the proposed development stands to be determined under the provisions of the Town and Country Planning (Scotland) Act 1997 as amended. Statutory EIA requirements for certain planning applications are set out within the Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017 as amended.

3.4 EIA Screening and Scoping

3.4.1 The site of 18.9ha exceeds the thresholds identified for EIA screening under Classes 10 or 12 of Schedule 2 of the 2017 EIA Regulations. Furthermore, the site is located within the

boundaries of Loch Lomond and the Trossachs National Park (LLTNP) and under the EIA Regulations, it is classified as a 'Sensitive Area':

> *"sensitive area" means any of the following: —*
>
> *(g) an area designated as a National Park by a designation order made by the Scottish Ministers under section 6(1) of the National Parks (Scotland) Act 2000(f).*

3.4.2 In recognition of the environmental sensitivities affecting the site and surrounding area, the Applicant considered from the outset that a formal EIAR would be required to support any PPiP application submitted for the proposed development. To confirm this and to obtain clarity on the required scope of the EIAR, a formal EIA Screening and Scoping Request was submitted in June 2021 to LLTNPA in their role as the relevant determining Planning Authority.

3.4.3 LLTNPA confirmed that a formal EIA would be required on account of likely significant effects from the proposed development. After consulting relevant stakeholders an EIA Scoping Opinion was issued by LLTNPA in July2021 to define the required scope of this EIAR. The Scoping Opinion is provided in full within **Appendix 3.1**.

3.5 Information Requirements and Guidance

Information Requirements

3.5.1 Schedule 4 of the EIA Regulations prescribes the information which must be included within an EIAR. The information requirements specified in Part 2 of Schedule 4 must be addressed in all EIARs, whilst the requirements specified in Part 1 must also be addressed to the extent "reasonably required to assess the environmental effects of the development and which the applicant can, having regard in particular to current knowledge and methods of assessment, reasonably be required to compile".

3.5.2 Schedule 4 of the EIA Regulations therefore require this EIAR to include descriptions of:

- Relevant environmental baseline characteristics. Each of the technical assessments presented in **Chapters 5 – 14** include Baseline sections to meet this requirement;
- Physical characteristics of the whole development, which in this case means identifying the key characteristics of the construction and operational phases of the proposed development (**Chapter 2 – Site and Proposed Development**);
- Consideration of the reasonable alternatives studied by the developer (**Chapter 2 – Site and Proposed Development**);
- The main characteristics of the production or operational phase, including natural resource usage (**Chapter 2 – Site and Proposed Development**);
- An estimate of expected residues and emissions (**Chapter 2 – Site and Proposed Development**);
- The assessment methodologies deployed in undertaking this EIA (technical assessment methodologies provided in **Subsection 3** within **Chapters 5 – 14**;
- Likely significant effects from the proposed development (assessments presented in **Subsection 7 – Potential Effects, Subsection 9 – Residual Effects** and **Subsection 10 – Cumulative Assessment** within the technical assessments presented in **Chapters 5 – 14**;
- Mitigation measures envisaged to avoid, prevent, reduce or, if possible, offset any identified significant adverse effects on the environment (**Section 3.8 – Proposed Mitigation and Enhancement, Subsection 6 – Embedded Mitigation** and **Subsection 8 – Further Mitigation and Enhancement** within the technical assessments presented in **Chapters 5 – 14**, and **Chapter 16 – Schedule of Mitigation and Monitoring**;
- Any proposed monitoring arrangements in relation to any predicted significant adverse effects (**Chapter 16 – Schedule of Mitigation and Monitoring**);
- A non-technical summary (**NTS**) of all of the above elements (**Volume 3**); and,

- A reference list detailing the sources used in the assessments (refer to the reference lists provided at the end of each technical assessment presented in **Chapters 5 – 14**.

EIA Guidance

3.5.3 A range of reference material and guidance has been drawn upon in developing the EIA methodology adopted for the proposed development. Over and above the EIA Regulations, this guidance includes:

- IEMA. (2015) IEMA Environmental Impact Assessment Guide to Shaping Quality Development;
- IEMA. (2016) IEMA Environmental Impact Assessment Guide to Delivering Quality Development;
- IEMA. (2004) IEMA Guidelines for Environmental Impact Assessment; and,
- Morris, P and Therivel, R. (2009) Methods of Environmental Impact Assessment

3.5.4 Topic specific guidance used in the preparation of the individual technical assessments presented in this EIAR is noted where relevant in **Subsection 2** of **Chapters 5 – 14**.

3.6 The EIA Process

3.6.1 The EIA Regulations emphasise that EIA is a process rather than output and involves the following stages:

- **Assessment work** culminating in the preparation of an EIAR in accordance with requirements prescribed by the EIA Regulations;
- **Public consultation on the application for planning permission, the EIAR and any other** relevant information. Consultation may be iterative rather than only occurring once in the EIA process;
- **Examination** by the relevant determining authority of the information presented in the EIAR and other relevant information including that received through the consultation; and,
- The relevant determining authority coming to a **reasoned conclusion** on the residual significant effects of the proposed development on the environment, prior to the determination of any related consenting application.

3.6.2 The EIA process therefore encompasses all stages of considering environmental issues associated with projects, from initial identification of relevant issues through to assessing the residual significance of **predicted** environmental effects and securing required mitigation. This ensures that all required mitigation is carried out in the implementation of projects. EIA therefore directly influences the design, construction, operation and, where relevant, decommissioning, of proposed projects, as well as providing information to decision makers.

3.7 EIA Methodology

Overview

3.7.1 Following confirmation of the required scope of the EIA in accordance with **Appendix 3.1 – EIA Scoping Opinion**, each environmental topic has been subject to investigation and assessment to identify and evaluate likely significant environmental effects. The survey and assessment methodologies deployed were based on recognised best practice and guidance relevant to each topic area, details of which are provided within relevant technical assessment EIAR (**Chapters 5 – 14**). In general terms, the technical assessments undertaken for each topic area and EIAR chapter include:

- Collation of existing baseline information regarding relevant aspects of the environment, together with surveys and fieldwork, as required, to fill any knowledge gaps or update historical information;
- Use of the collated baseline to identify relevant trends, describe the baseline scenario and predict the evolution of this baseline scenario in the absence of the proposed development;

- Consultation with relevant consultees in relation to the EIA scope and emerging findings;
- Consideration of the potential effects of the proposed development on the baseline scenario (and its predicted evolution), followed by the identification of design changes, mitigation measures to avoid or reduce predicted significant adverse effects, and possible enhancement measures to improve environmental outcomes;
- Assessment of the significance of predicted residual effects from the proposed development and consideration of any monitoring required in relation to predicted residual significant adverse effects;
- Production of EIAR chapter; and,
- Input into a consolidated schedule of required mitigation measures and proposed monitoring arrangements for the proposed development.

3.7.2 The detailed methodology adopted to undertake each individual technical assessment is presented in **Subsection 3 – Methodology** within **Chapters 5 – 14**.

Key Methodological Assumptions

3.7.3 The following key assumptions have been used to ensure that this EIAR is a proportionate assessment of the level and significance of likely effects from the proposed development:

- The EIA including the preparation of this EIAR has been undertaken in full accordance with current EIA Regulations;
- The proposed development will be built out in accordance with **Appendix 2.1 – Parameters Plan**. All other drawings submitted as part of this EIAR or the PPiP application are for illustrative purposes only, as the detailed siting and design of the proposed development required to be confirmed after PPiP is granted;
- Construction will be completed by 2030, with visitor accommodation and attractions scheduled to open in that year;
- Baseline conditions are generally considered to be current conditions at the site and surrounding area, unless materially affected by the approved developments noted in **Table 2-2**. The potential for cumulative effects as a result of the construction and operation of the approved developments has been considered;
- In accordance with the EIA Regulations, an assessment of likely effects (including cumulative effects) from the proposed development has been carried out in order to identify, describe and assess any significant effects. As such, the assessment only considers possible effects which have some potential to be significant within the context of the EIA Regulations. Other possible effects which have no potential to be significant in EIA terms have necessarily been scoped out of this EIA;
- The assessment of likely significant cumulative effects has assumed that the cumulative developments identified in **Section 2.4** will be built out as set out in the planning applications, planning permissions and associated documents available in the public domain for these developments; and,
- Suitable planning conditions and planning obligations will be attached to any planning permission granted for the proposed development to secure relevant mitigation measures proposed in this EIAR (**Chapter 16 – Schedule of Mitigation and Monitoring**).

Consultation

3.7.4 In addition to the EIA Scoping Opinion from LLTNP, consultation has been undertaken by the applicant to agree scope and assessment methods, proposed mitigation measures and design parameters. Consultation has been undertaken with the following stakeholders:

- Scottish Environment Protection Agency (SEPA);
- NatureScot;
- Historic Environment Scotland (HES);
- Transport Scotland;

- Scottish Water;
- Forestry and Land Scotland (FLS);
- Visit Scotland;
- Scotrail;
- West of Scotland Archaeological Services (WoSAS);
- LLTNP Planning;
- LLTNP Landscape Officer;
- LLTNP Access Officer;
- West Dunbartonshire Council – Roads;
- West Dunbartonshire Council – Environmental Health; and,
- West Dunbartonshire Council – Flooding.

3.7.5 A programme of consultation and engagement with the community has also been undertaken. This is detailed within the accompanying **Pre-Application Consultation Report (PAC)** submitted in support of the PPiP application.

Establishing Baseline Conditions

3.7.6 A range of site surveys and data collection exercises have been undertaken to identify environmental conditions at the proposed site and surrounding area. The surveys are reported in each topic (**Chapters 5-14**). Data has also been collated regarding relevant approved cumulative developments that need to be considered in this EIA (see **Section 2.4**).

3.7.7 The EIAR has been based on technical surveys and assessments, the reporting of which is frequently too detailed for incorporation into **Volume 1** of this EIAR (e.g. ecology surveys). In such instances the technical survey and assessment reports are provided in full as an Appendix to this EIAR (**Volume 2**), with a relevant summary and reference to the full survey or assessment provided in Volume 1. The geographical scope of these appended surveys and assessments has been based on the likelihood for significant effects in accordance with the agreed EIA scope.

Types of Effect

3.7.8 Schedule 4 to the EIA Regulations requires consideration of a variety of types of effect, namely direct / indirect, secondary, cumulative, positive / negative, short / medium / long-term, and permanent / temporary. All identified effects need to be considered in terms of how they are predicted to arise, whether they are positive (beneficial) or negative (adverse), their temporal occurrence (i.e. when they are predicted to occur) and their duration once the effect does occur. This includes consideration of effects during both the construction and operational phases of the proposed development.

3.7.9 The EIAR must also consider the potential for effects identified through one topic specific technical assessment to generate secondary or related effects of relevance to other EIAR topics. At the outset, this EIA recognised that predicted traffic movements (proposed development, existing and approved cumulative developments) will need to be taken account of in the Noise and Air Quality technical assessments as well as the Traffic and Transport EIAR Chapter. Traffic data calculated to inform the **Transport Assessment** (TA) submitted separately in support of the PPiP application has also been used to inform the traffic and transport, noise and air quality chapters of this EIAR.

3.7.10 The spatial scope for the identification of likely significant environmental effects varies between environmental topic areas and a relevant Study Area is therefore defined within each technical assessment (**Chapters 5-14**). In general terms, this spatial scope depends on the location of relevant receptors and the existence of known pathways for effects from the proposed development to the identified receptors. Where considered necessary, a Study Area map is included within the Appendix to each relevant technical assessment chapter.

Uncertainty

3.7.11 The prediction of future effects inevitably involves a degree of uncertainty. Where necessary, the technical assessments presented in **Chapters 5 - 14** describe the principal factors giving rise to uncertainty in the prediction of effects and the degree of the uncertainty.

3.7.12 Confidence in the assessments in this EIAR can be derived from the application of robust topic specific assessment methodologies, which have been developed and implemented in accordance with relevant technical guidance and standards (e.g. Design Manual for Roads and Bridges (DMRB), Guidelines for Ecological Impact Assessment in the UK and British Standard Institute). Where the success of a mitigation measure is uncertain, the extent of the uncertainty has been identified in the EIAR and a suitable response identified.

Mitigation and Enhancement Measures

3.7.13 The technical assessments presented in **Chapters 5 – 14** of this EIAR firstly identify predicted effects from the proposed development taking into account embedded mitigation measures, before identifying any further mitigation reported and then reporting predicted residual effects.

3.7.14 The EIA Regulations requires the EIAR to include a description of *"measures envisaged in order to avoid, prevent or reduce and, if possible, offset likely significant adverse effects on the environment."* **Subsection 8** within each technical assessment presented in **Chapters 5 - 14** therefore consider the need for additional mitigation measures (beyond embedded mitigation) to avoid significant adverse effects which are predicted to occur. Consideration is also given to potential measures to reduce predicted 'not significant' adverse effects and to enhance predicted beneficial effects from the proposed development where appropriate.

3.7.15 A schedule of all proposed mitigation measures is provided in **Chapter 16 – Schedule of Mitigation and Monitoring**. This schedule will assist LLTNPA in securing the required mitigation measures, proposed monitoring and conditions required within any PPiP approval.

The Significance of Likely Residual Effects

3.7.16 Residual effects are the environmental effects that will remain after the incorporation of both embedded and additional mitigation measures. It is these residual effects which should be considered when assessing the significance of the proposed development, rather than the unmitigated effects as unmitigated effects will not occur. For example, whilst the proposed development may affect protected species or habitats, appropriate mitigation has been identified to ensure that significant effects on such do not occur.

3.7.17 To provide an objective assessment of residual effects, their significance has been determined and identified in the EIAR, as detailed below. This allows for comparison of effects between topics, strengthens the assessment of impact interactions and allows decision makers to examine and provide a reasoned conclusion on the significant environmental effects.

3.7.18 The two principal criteria for determining significance of an environmental effect are the magnitude of change and the sensitivity of an identified receptor to this change. The likelihood of the change occurring is also considered, as a constituent factor affecting the predicted magnitude of change.

3.7.19 The approach to assigning significance to predicted environmental effects is not detailed within the EIA Regulations, meaning that it is necessary to develop effect significance thresholds to underpin the assessments reported in this EIAR. These thresholds are defined on a topic specific basis within **Chapters 5–14**, taking account of relevant regulations, guidance, standards, the advice and views of consultees, and professional judgement. **Subsection 3 – Methodology** within each chapter explains the topic specific methodology adopted to identify the level and associated significance of predicted effects with reference to relevant thresholds. Where relevant, this is based on the factors identified above and the generic criteria set out in **Table 3-1** below.

Table 3-1: Generic Significance Criteria

	Level of Effect	Criteria
Significant	Substantial	These effects are assigned this level of significance as they represent key factors in the decision-making process. These effects are generally, but not exclusively, associated with sites and features of national or regional importance. A change at a district scale site or feature may also enter this category.
	Major	These effects are likely to be important considerations at a local or district scale and may become key factors in the decision-making process.
	Moderate	These effects, while important at a local scale, are not anticipated to be key decision-making issues.
Not Significant	Minor	These effects may be raised as local issues but are unlikely to be of importance in the decision-making process.
	Negligible or No Effect	Either no effect or effect which is beneath the level of perception, within normal bounds of variation or within the margin of forecasting error. Such effects should not be considered by the decision-maker.

3.7.20 Effects that are described as ''substantial,' 'major' or 'moderate' are determined to be significant, whereas effects that are described as 'minor' or 'negligible' are determined to be not significant.

3.8 Impact Interactions

3.8.1 **Chapter 15 – Impact Interactions** provides the assessment of impact interactions, i.e. receptors being affected by more than one environmental effect and therefore potentially being subject to a more significant combined effect than reported within the individual technical EIAR (**Chapter 5–14**). Details of the approach to identifying and assessing impact interactions is also provided within **Chapter 15**.

3.9 Approach to Cumulative Impact Assessment

3.9.1 The EIA Regulations require likely significant cumulative effects from a development proposal in combination with existing and approved development to be described within an EIAR.

3.9.2 Existing developments are considered as part of the baseline scenario within the technical assessments provided in this EIAR, whilst approved and proposed developments are considered separately within the cumulative impact assessment section of each technical assessment chapter. Approved and proposed developments of relevance to this EIAR are listed on **Table 2-2**.

4 Legislative and Planning Policy Context

4.1 Introduction

4.1.1 This chapter sets out the key planning legislation, policies and other material considerations applicable to the proposed development which have informed the siting, design and environmental assessment processes. Consideration is given to the following matters in turn:

- Relevant Statutory Provisions;
- Relevant national policies, advice and guidance;
- Statutory Development Plan applicable to the site; and,
- Other material considerations, including the National Park Plan, local planning guidance.

4.1.2 The purpose of this chapter is to identify all legislative and policy requirements and considerations relevant to the technical assessments provided in **Chapters 5 – 14** of this EIAR. Appropriate cross-references are provided within **Subsection 2** of each technical assessment chapter to confirm the legislation and policies applicable to the assessment.

4.1.3 This chapter is factual in nature and does not assess the proposed development's accordance with relevant planning policies. A separate Planning Statement assesses in detail how the proposal accords with relevant Development Plan policies and other material considerations.

4.2 Relevant Statutory Provisions

4.2.1 The key planning legislation of relevance to this EIAR and the overall EIA process is:

- The Town and Country Planning (Scotland) Act 1997 as amended ('the Principal Act');
- The Planning (Listed Buildings and Conservation Areas) (Scotland) Act 1997 as amended;
- The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017 as amended ('the EIA Regulations');
- The Town and Country Planning (Development Management Procedure) (Scotland) Regulations 2013 as amended;
- The National Parks (Scotland) Act 2000 as amended; and,
- The Climate Change (Scotland) Act 2009.

4.2.2 Under Section 25 of the Principal Act, the determination of all planning applications must be made in accordance with the statutory Development Plan applicable to the site of a proposed development, unless material considerations indicate otherwise. Section 264A of the Principal Act also requires special attention to be paid to the applicable National Park Plan. Section 59 of the Planning (Listed Buildings and Conservation Areas) (Scotland) Act 1997 as amended requires Planning Authorities to have "*special regard to the desirability of preserving the building or its setting or any features of special architectural or historic interest which it possesses*".

4.2.3 Section 1 of the National Parks (Scotland) Act 2000 as amended identifies the four aims of Scotland's National Parks including Loch Lomond and the Trossachs National Park (LLTNP):

> *"(a) to conserve and enhance the natural and cultural heritage of the area;*
>
> *(b) to promote sustainable use of the natural resources of the area;*
>
> *(c) to promote understanding and enjoyment (including enjoyment in the form of recreation) of the special qualities of the area by the public; and,*
>
> *(d) to promote sustainable economic and social development of the area's communities."*

4.2.4 The aims of the National Park Act are material planning considerations. Section 9 of the same Act states that the aims should be achieved collectively. However, if in relation to any matter it appears to the National Park Authority that there is a conflict between the first aim, and the other

National Park aims, greater weight must be given to the conservation and enhancement of the natural and cultural heritage of the area.

4.2.5 Section 44 of the Climate Change (Scotland) Act 2009 requires all Scottish public bodies to "*act in the way best calculated to*" contribute to the delivery of Scotland's greenhouse gas (GHG) emissions reduction targets and climate change adaptation programmes, as well as "*in a way that it considers most sustainable*". These public body duties are relevant insofar as the Planning Authority (LLTNP) is a Scottish Public Authority.

4.2.6 The relevance and implications of the EIA Regulations for this EIAR are detailed separately in **Chapter 3 – EIA Process**.

4.2.7 It should be noted that the technical assessments presented in **Chapters 5–14** have also been prepared in accordance with a wide range of topic specific legislation, non-planning policies, technical guidance and standards, as detailed within Subsection 2 of each chapter.

4.3 National Planning Policies

4.3.1 National planning policy is contained within both the National Planning Framework 3 (NPF3) and Scottish Planning Policy (SPP), both of which were published in June 2014. Draft NPF4 is currently available for review and is a material consideration, however it has not yet been approved.

National Planning Framework 3

4.3.2 The NPF3 provides a statutory framework around which to orientate Scotland's long-term spatial development. The Framework highlights the spatial planning implications of multiple national policy documents and commitments. In overall terms NPF3 emphasises the Scottish Government's commitment to increasing sustainable economic growth across all areas of Scotland and orientates the efforts of Scotland's planning system towards this purpose.

4.3.3 The introduction to the NPF3 notes the importance of maintaining economically active and vibrant rural areas whilst "*safeguarding our natural and cultural assets and making innovative and sustainable use of our resources*". Related to this, the document identifies tourism as a key economic growth sector and includes a strategy for Scotland's two National Parks. This notes that the National Parks are "*sustainable, successful places*" where the Scottish Government wishes to see "*planning and innovation continue to strengthen communities, encourage investment, support tourism, deliver affordable rural housing, and encourage high quality place making and visitor experiences*." At the same time NPF3 expects Development Plans to safeguard their "*exceptional environmental quality*".

4.3.4 The national spatial strategy of the NPF3 is structured around four key themes, namely: a successful, sustainable place; a low carbon place; a natural, resilient place; and a connected place. These themes are presented as 'planning outcomes' within the SPP (2014).

4.3.5 With respect to the Glasgow and Clyde Valley City Region (which includes West Dunbartonshire and therefore in local authority terms, Balloch), NPF3 focuses on efforts to regenerate post-industrial areas and provides support for proposals which increase employment and economic development. It also identifies the Central Scotland Green Network (CSGN) as a National Development, encourages the remediation of derelict land, promotes active and sustainable travel and supports the protection and enhancement of green infrastructure.

Draft NPF4

4.3.6 Following the Planning (Scotland) Bill receiving Royal Assent in July 2019, Scottish Ministers have been developing a new National Planning Framework 4 (NPF4). NPF4 will, for the first time, incorporate Scottish Planning Policy and will take on enhanced status as part of the statutory Development Plan. NPF4 will have a longer time-horizon, fuller regional coverage and improved alignment with wider programmes and strategies. Draft NPF4 was recently out for consultation until 31st March 2022, with a finalised version expected to be laid to parliament for approval in Summer 2022.

Scottish Planning Policy

4.3.7 SPP (2014) is a material consideration that carries significant weight. It sets out the Scottish Government's expectations regarding the treatment of specific planning issues within development planning and development management. The document aims to contribute to the achievement of the Scottish Government's overarching purpose of achieving sustainable economic growth.

4.3.8 SPP's Principal Policy on Sustainability (paragraphs 24-35) includes a presumption in favour of development that contributes to sustainable development, which relates to the identification of the need for and acceptability of the development. To implement this policy presumption, SPP (paragraph 29) identifies 13 sustainable development principles which should guide planning policies and decisions, of which 12 are relevant to the proposed development:

- *"giving due weight to net economic benefit;*
- *responding to economic issues, challenges and opportunities, as outlined in local economic strategies;*
- *supporting good design and the six qualities of successful places;*
- *making efficient use of existing capacities of land, buildings and infrastructure including supporting town centre and regeneration priorities;*
- *supporting delivery of accessible housing, business, retailing and leisure development;*
- *supporting climate change mitigation and adaptation including taking account of flood risk;*
- *improving health and well-being by offering opportunities for social interaction and physical activity, including sport and recreation;*
- *having regard to the principles for sustainable land use set out in the Land Use Strategy;*
- *protecting, enhancing and promoting access to cultural heritage, including the historic environment;*
- *protecting, enhancing and promoting access to natural heritage, including green infrastructure, landscape and the wider environment;*
- *avoiding over-development, protecting the amenity of new and existing development; and,*
- *considering the implications of development for water, air and soil quality."*

4.3.9 SPP's other Principal Policy, on Place making (paragraphs 36-57), seeks to direct new development to the right location and to encourage a design-led approach to development in order to create high quality places. SPP (under paragraph 40) states that high quality development which demonstrates the following six qualities of successful places should be supported: "*Distinctive, Safe and Pleasant, Welcoming, Adaptable, Resource efficient, and Easy to move around and beyond*". As noted in **Section 4.4** below, these six qualities are referenced in Overarching Policy 1 – Strategic Principles within the adopted LDP.

4.3.10 Subject specific provisions within the SPP of relevance to the proposed development are outlined in **Table 4-1** below.

Table 4-1: Relevant Subject Policies Within Scottish Planning Policy (2014)

Subject Policy	Relevance
Promoting Rural Development (Paragraphs 74 – 91)	This section identifies planning principles related to sustainable rural development including *"…encourage rural development that supports prosperous and sustainable communities and businesses whilst protecting and enhancing environmental quality…"*. The section includes a sub-section regarding planning within Scotland's National Parks (paragraphs 84 – 86), which lists the statutory aims of National Parks (see Section 5.2 above) and notes the need for LDP's covering National Parks to be consistent with National Park Partnership Plans (see below).
Supporting Business and Employment (Paragraphs 92 – 108)	This section highlights the need to *"give due weight to net economic benefit of Proposed Development"* (paragraph 93). The SPP identifies tourism as one of several key growth sectors which should be appropriately supported through development plans.
Valuing the Historic Environment (Paragraphs 135 – 151)	This section states that planning should promote the care and protection of the designated and non-designated historic environment and should take account of all aspects of the historic environment. Detailed policy provisions are set out in order to protect and enhance different types of historical assets.
Listed Buildings (Paragraph 141)	This paragraph states that *"where planning permission and listed building consent are sought for development to, or affecting, a listed building, special regard must be given to the importance of preserving and enhancing the building, its setting and any features of special architectural or historic interest…".*
Gardens and Designed Landscapes (Paragraph 148)	This paragraph states that *"planning authorities should protect and, where appropriate, seek to enhance gardens and designed landscapes included in the Inventory of Gardens and Designed Landscapes and designed landscapes of regional and local importance".*
Archaeology (Paragraph 150)	This paragraph states that *"planning authorities should protect archaeological sites and monuments as an important, finite and non-renewable resource and preserve them in situ wherever possible*". In-situ preservation is encouraged, but in cases where this is not possible conditions or legal obligations should be used to ensure archaeological assets are recorded and analysed before development proceeds.
Valuing the Natural Environment (Paragraphs 193 - 233)	This section identifies a number of planning principles related to natural heritage protection and ecological resilience. Principles (paragraph 194) of relevance to the Proposed Development include that planning should: ▪ *"facilitate positive change while maintaining and enhancing distinctive landscape character;* ▪ *conserve and enhance protected sites and species;* ▪ *promote protection and improvement of the water environment...in a sustainable and co-ordinated way;* ▪ *protect and enhance ancient semi-natural woodland as an important and irreplaceable resource, together with other native or long-established woods, hedgerows and individual trees with high nature conservation or landscape value; and,* ▪ *seek benefits for biodiversity from new development where possible..."*
Protecting Designated Sites (Paragraph 196)	This paragraph requires designated areas and sites to be identified and appropriately protected through development plans, without the use of buffer zones. It also states that "*the level of protection given to local designations should not be as high as that given to international or national designations*".
Development Management Decisions (Paragraphs 202 - 203)	This section states that planning decisions "*should take account of potential effects on landscapes and the natural and water environment, including cumulative effects*" (paragraph 202). It further states that "*planning permission should be refused where the nature or scale of proposed development would have an unacceptable impact on the natural environment*" (paragraph 203). The same paragraph notes that whilst effects on statutorily protected sites will be an important consideration, this "*does not impose an automatic prohibition on development*".
Non-Native Species (Paragraph 210)	This paragraph states that "*where non-native species are present on site, or where planting is planned as part of a development, developers should take into account the provisions of the Wildlife and Countryside Act 1981 relating to non-native species*".
National Designations and Protected Species (Paragraphs 212 - 214)	Reflecting legislative requirements, these paragraphs identify criteria to safeguard nationally designated sites (including National Parks) and protected species from adverse effects. In relation to the protection of designated sites and protected species, these criteria have effectively been transposed into Natural Environment Policies 2-4 of the adopted Loch Lomond and the Trossachs LDP (2016).
Woodland (Paragraph 218)	This paragraph refers to and aligns directly with provisions set out in the Scottish Government's Control of Woodland Removal Policy 2009 (see below).

Subject Policy	Relevance
Maximising the Benefits of Green Infrastructure (Paragraphs 219 - 233)	This section identifies a number of planning principles related to the protection, enhancement and promotion of green infrastructure including core paths and other important routes.
Managing Flood Risk & Drainage (Paragraphs 254-268)	This section promotes a precautionary approach to flood risk management. Where relevant, flood risk assessments and the deployment of Sustainable Urban Design (SUDs) are required (paragraph 255).
Promoting Sustainable Transport and Active Travel (Paragraphs 269-291)	This section includes a requirement for development proposals to consider traffic impacts including cumulative effects (paragraph 286).

National Planning Advice and Circulars

4.3.11 National planning policy is supported by numerous Scottish Government Planning Circulars, Planning Advice Notes (PANs), Advice Sheets, Ministerial/Chief Planner Letters to Planning Authorities, as well as guidance documents prepared by Key Agencies of the Scottish Government. Annexe A to Scottish Government Planning Circular 3/2013: Development Management Procedures confirms that amongst other considerations, the types of documents listed above are all potential material considerations in the determination of a planning application depending on the individual context of the case.

4.3.12 The following guidance and advice documents are considered to be of relevance to the proposed development and have been considered where appropriate in undertaking this EIAR:

- SEPA Flood Risk Standing Advice for Planning Authorities and Developers (November 2020);
- PAN 33 Development of Contaminated Land (December 2017);
- SEPA's Development Management Guidance: Flood Risk (July 2017);
- Scottish Government Flood Risk Planning Advice (June 2015);
- PAN 1/2013: Environmental Impact Assessment (August 2013);
- PAN 2/2011 Planning and Archaeology (July 2011);
- Planning Circular 3/2011: The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2011;
- PAN 1/2011 Planning and Noise (March 2011);
- PAN 3/2010 Community Engagement (August 2010);
- PAN 65 Planning and Open Space (June 2008);
- PAN 60 Planning for Natural Heritage (2000, revised January 2008);
- PAN 81 Community Engagement (March 2007);
- PAN 51 Planning, Environmental Protection and Regulation (Revised October 2006);
- PAN 79 Water and Drainage (September 2006);
- PAN 75 Planning for Transport (August 2005);
- PAN 68 Design Statements (August 2003); and,
- PAN 61 Planning and Sustainable Urban Drainage Systems (July 2001);

Other National Policies, Advice and Guidance

Scotland's National Strategy for Economic Transformation 2022

4.3.13 The Strategy sets out the priorities for Scotland's economy as well as the actions needed to maximise the opportunities of the next decade to achieve our vision of a wellbeing economy. It sets out how, over the next ten years, how Scotland will aim to deliver economic growth that significantly outperforms the last decade, so that the Scottish economy is more prosperous, more productive and more internationally competitive. This will be done through focused interventions, working in collaboration with businesses and other partners, building on strengths in sectors like energy, financial services, creative industries and life-sciences and carving out new strengths in technology, space and decarbonisation. Five key transformational programmes of action have been identified that can drive improvements in Scotland's economy: stimulating entrepreneurship; opening new markets; increasing productivity; developing the skills we need for the decade ahead; and ensuring fairer and more equal economic opportunities.

Tourism Development Framework for Scotland 2020 (Refresh 2016)

4.3.14 SPP (2014) requires Development Plans to be informed by the Tourism Development Framework for Scotland, which is also identified as a key document for planning decisions more widely. The Framework was first published in 2013 and refreshed in 2016 to align with a mid-term review of the national tourism strategy, Tourism Scotland 2020.

4.3.15 The Framework sets out actions to assist and promote growth in Scotland's visitor economy to 2020. It supports the implementation of Tourism Scotland 2020 and the achievement of its central target to secure annual visitor spend of between £5.5bn and £6.5bn to 2020 for overnight visitors. The Framework does this by providing guidance to development planning authorities to help secure growth in the visitor economy.

4.3.16 The Framework identifies the importance of the tourism economy within the LLTNP and states that "*further opportunities remain around the south of the Loch at the gateway to the National Park*" for hotel and other accommodation (paragraph 2.48). At paragraphs 2.54 – 2.58 the Framework defines 'resort development' as "*destinations where a collection of activities, such as eating, sleeping and recreation, can be undertaken in one defined location*" and confirms that such development can be situated in urban or rural locations, including within National Parks as existing key visitor destinations. The "*significant economic opportunities*" provided by resort development in terms of onsite rural employment, off-site supply chain benefits and the type of visitors they attract is noted within paragraph 2.55 of the Framework.

Historic Environment Policy for Scotland 2019

4.3.17 Historic Environment Policy (HEP) is a policy statement directing decision-making that affects the historic environment. It is relevant to a wide range of decision-making at national and local levels. It is supported by detailed policy and guidance. HEPS is a material consideration for planning proposals that might affect the historic environment, and in relation to listed building consent and scheduled monument consent.

Creating Places - A Policy Statement on Architecture and Place for Scotland (2013)

4.3.18 This document sets out the Scottish Government's overall policy statement on architecture and place. The document defines 'good design' as "*an innovative and creative process that delivers value*" and provides a detailed explanation of the six qualities of successful places which are now embedded within the SPP (2014).

Designing Streets – A Policy Statement for Scotland (2010)

4.3.19 Designing Streets is a policy statement for street design and marks a change in the emphasis of guidance on street design towards place-making and away from a system focused upon the dominance of motor vehicles.

Scottish Government Control of Woodland Removal Policy (2009)

4.3.20 This policy provides a national position to inform decisions on all woodland removal across Scotland. The policy includes a presumption in favour of protecting woodland, stating that removal should only be permitted where it would achieve significant and clearly defined additional public benefits. The concept of additionality is therefore central to the application of the Policy.

4.3.21 The Policy identifies situations where:

- There is a strong presumption against removal of woodland;
- Woodland removal is acceptable without compensatory planting (CP); and,
- Woodland removal is acceptable with CP.

4.3.22 The Policy requires consideration of any need for CP as part of a judgement regarding the acceptability of woodland removal, rather than as a separate issue or automatic presumption. Consequently, if significant net additional public benefit can be demonstrated from a development proposal involving woodland removal without compensatory planting, there is no policy requirement for compensatory planting to then be provided (whether on a like-for-like or other basis).

4.3.23 Annex C of the Policy specifies acceptability criteria for demonstrating significant net additional public benefit either in the absence of, or with, CP. The criteria regarding acceptability in the absence of CP include benefits derived from land use change (whether or not the intended direct result of a development proposal) as well as other environmental and public safety factors.

4.3.24 The policy is supported by implementation guidance (March 2015) for Forestry & Land Scotland staff. This document notes that the need for any compensatory planting should be minimised and that compensatory planting "*should be seen as the final option once all other solutions have been exhausted*".

4.4 The Development Plan

Overview

4.4.1 The statutory Development Plan applicable to the site post-dates these and has undergone a formal examination by Scottish Ministers. Section 25 of the Principal Act requires planning applications to be determined in accordance with the Development Plan unless material considerations indicate otherwise.

4.4.2 The current statutory Development Plan applicable to the site of the proposed development comprises the Loch Lomond and the Trossachs Local Development Plan 2017 – 2021 ('the LDP'), which was adopted by LLTNPA in December 2016, and associated adopted Supplementary Guidance. The timescales for the next LDP have been revised and the current LDP will remain in place until 2024 to ensure the next LDP aligns with the new Planning Act.

Loch Lomond and the Trossachs Local Development Plan 2017 – 2021

4.4.3 The LDP is split into four distinct sections (and appendices), of which **Sections 2 – Vision, Section 3 – Place and Section 4** - Policies are of relevance.

Section 2 – Vision

4.4.4 The LDP's vision is focused around conservation, visitor experience and rural development. Of relevance to the proposed development, it calls for "*a high quality, authentic experience for visitors, with many opportunities to appreciate and enjoy the natural and cultural heritage within an internationally renowned landscape that compares to the best on offer around the world*". The LDP's Development Strategy Map (page 17) identifies Balloch as one of eight locations for "*Strategic Tourism Opportunities*", reflecting its role as a visitor destination and gateway to the National Park.

Section 3 – Place

4.4.5 This section sets out a spatial strategy for the LLTNP area, including land use allocations for each defined settlement. The following land use allocations in Balloch are of relevance:

- Balloch VE1: West Riverside – allocated for visitor experience related uses (as defined in approved Visitor Experience Planning Guidance – see **Section 4.4.12** below). This allocation covers the eastern part of the proposed site;
- Balloch VE4: Woodbank House – allocated for visitor experience related uses. This allocation covers the proposed site, Woodbank House and attendant grounds; and,
- Balloch MU1: The Old Station – allocated for mixed use (visitor experience and transport) uses. This allocation is located immediately south east of the proposed site.

4.4.6 No details are provided in Section 3 of the LDP regarding development requirements or design principles for these LDP site allocations.

Section 4 - Policies

4.4.7 This section of the LDP sets out three overarching policies which apply to all development proposals, followed by a suite of subject specific policies. The most relevance policy is Visitor Experience Policy 1, which at criterion (a) provides support for proposals forming a strategic tourism opportunity within Balloch. The other criterion within this policy relate to small-scale proposals and are not relevant to the proposed development.

4.4.8 Other policies within the adopted LDP of particular relevance to the proposed development are outlined in **Table 4-2**. Particular attention is given to Overarching Policies 1 – Strategic Principles and 2 – Development Requirements as these set the framework within which all environmental and wider planning issues will be assessed through individual subject policies.

Table 4-2: Relevant Policies Within the Loch Lomond and the Trossachs LDP (2016)

LDP Policy Title	Summary
Overarching Policy 1 - Strategic Principles	Sets out principles linking the LDP with the Scottish Planning Policy (SPP, 2014 – see Section 4.4 below). All proposals should demonstrate their accordance with relevant principles, including: Appendix A Collective achievement of the four statutory National Park aims (see Section 4.2 above) and implementation of the National Park Partnership Plan; Appendix B Contributing to sustainable development and climate change mitigation, including through sustainable design; Appendix C Prioritising the reuse of brownfield and vacant land; Appendix D Prioritising place making, including in street design; Appendix E Increasing connectivity, especially to public transport and key destinations, and providing safe access; Appendix F Open space provision that is "*high quality, appropriate to the needs of the local community, integrated to the development and provide links to the wider green network*"; *Appendix G* "*Minimising adverse impacts on water, air and soil quality";* *Appendix H* *"Addressing climate change impacts";* *Appendix I* *"Avoiding significant flood risk";* Appendix J *"Relating well to the landscape context and setting", including in terms of cultural heritage and local built form*"; and, Appendix K "*Incorporating appropriate soft and hard landscaping, a planting scheme, and measures to protect existing trees and other landscape features*".
Overarching Policy 2 - Development Requirements	Provides high level design and environmental assessment criteria to assess all proposals, including the following of relevance to the PPiP application for the proposed development: *11 "Safeguard visual amenity and important views, protect and/or enhance rich landscape character, and features and areas specifically designated for their landscape values at any level;* *12 avoid any significant adverse impacts of: flooding, noise/vibration, air emissions/ odour/fumes/dust, light pollution, loss of privacy/sunlight/daylight;* *13 protect and/or enhance the character, appearance and setting of the historic environment;* *14 protect and/or enhance the biodiversity, geodiversity, water environment, sites and species designated at any level…including ancient and semi-natural woodland, green infrastructure and habitat networks;* *15 support Active Travel choices where possible…and transport infrastructure;* *16 provide safe road access and appropriate parking provision;* *17 promote understanding and enjoyment (including recreation) of the special qualities of the area by the public including safeguarding access rights;* *18 achieve a high quality design and layout, provide a positive sense of place, and compliment local distinctiveness; and* 19 *adaptable for the changing needs of future users, designing for extreme weather, fulfil disabled requirements, support new businesses, training/jobs for local people and a mix of uses/tenures…".*
Overarching Policy 3 - Developer Contributions	Sets out the circumstances in which development contributions will be sought in respect of proposals, including for infrastructure upgrades required to make the proposal acceptable in planning terms.
Visitor Experience Policy 2 - Delivering a World Class Visitor Experience	Requires tourism development proposals to enhance the visitor experience of the National Park.
Transport Policy 2 - Promoting Sustainable Travel and Improved Active Travel Options	Sets out criteria requiring proposals to contribute positively to "*encouraging safe, sustainable travel and improving active travel options*" throughout the National Park.

LDP Policy Title	Summary
Transport Policy 3 - Impact Assessment and Design Standards of New Development	Requires large-scale proposals to be supported by a Transport Statement and Travel Plan, and to implement any identified appropriate mitigation, in order to minimise adverse traffic effects. The policy also sets out design related assessment criteria to ensure that proposals satisfy relevant technical standards and contribute to place making in the National Park.
Natural Environment Policy 1 - National Park Landscapes, seascape and Visual Impact	Requires proposals to protect the defined Special Qualities (SQ) of the LLTNP. In this regard proposals must *"be sympathetic to their setting and minimise visual impact*".
Natural Environment Policy 2 - European Sites - Special Areas of Conservation (SAC) and Special Protection Areas (SPA)	In line with European legislative requirements, this policy sets out criteria to protect SPAs and SACs from significant adverse effects relating to the integrity and conservation objectives of each designated site.
Natural Environment Policy 3 - Sites of Special Scientific Interest, National Nature Reserves and RAMSAR Sites	Requires development affecting these nationally designated sites to either result in an overall "*enhancement*" to the designation, not have an adverse effect on its conservation objectives or integrity, or otherwise demonstrate that "*adverse effects on the qualities for which the area has been designated are clearly outweighed by social or economic benefits of national importance*".
Natural Environment Policy 4 - Legally Protected Species	Affords protection to all legally protected species from adverse effects, unless criteria protecting the conservation status of the species, the absence of alternatives and the demonstration of "*public health, public safety or other imperative reasons of overriding public interest, including those of a social or economic nature*" are satisfied.
Natural Environment Policy 5 - Species and Habitats	Sets out criteria to protect habitats and species identified in the National Park Biodiversity Action Plan from unacceptable adverse impacts. Also requires consideration of effects on ecological functions and the continuity and integrity of species and habitats. Compensatory and management measures are required where adverse effects are predicted.
Natural Environment Policy 6 - Enhancing Biodiversity	Requires proposals to enhance biodiversity by protecting, managing and enhancing natural landscape, wildlife, wildlife habitat, habitat networks and green corridors. The policy also encourages the planting of native species.
Natural Environment Policy 8 - Development Impacts on Trees and Woodlands	Sets out criteria to protect against the loss or deterioration of loss of ancient or long-established plantation or semi-natural woodland. Development proposals resulting in the loss of woodland which contributes to local amenity, character and/or are of nature conservation value or historic significance will not be supported. The policy refers to the Scottish Government's Control of Woodland Removal Policy in relation to woodland removal and compensatory planting requirements.
Natural Environment Policy 9 - Woodlands on or Adjacent to Development Sites	Requires proposals which may affect trees or woodland to comply with British Standard 5837:2012.
Natural Environment Policy 11 - Protecting the Water Environment	Requires proposals not to have a significant adverse effect on the water environment.
Natural Environment Policy 12 - Surface Water and Wastewater Management	Requires proposals to connect to public sewers where available.
Natural Environment Policy 13 - Flood Risk	Requires compliance with the SPP (2014) Flood Risk Framework.
Natural Environment Policy 16 - Land Contamination	Requires proposals on or close to known or suspected contamination to be supported by an appropriate risk assessment.

LDP Policy Title	Summary
Historic Environment Policy 1 - Listed Buildings	Criterion (b) restricts the demolition of listed buildings. Criterion (c) seeks to limit enabling development to the minimum level required and ensure it is sensitively designed.
Historic Environment Policy 3 - Wider Built Environment and Cultural Heritage	Sets out criteria to protect buildings or feature of architectural and/or historical merit or of cultural significance.
Historic Environment Policy 4 - Gardens and Designed Landscapes (GDL)	Requires proposals not to adversely impact on GDL character, important views or wider landscape setting.
Historic Environment Policy 5 – Conversion and Re-Use of Redundant Buildings	Requires proposals for the conversion and reuse of "*buildings of vernacular quality and local historic and/or architectural interest*" to demonstrate the building is structurally sound and that conversion would not involve significant "*rebuilding or new building elements*".
Historic Environment Policy 6 - Scheduled Monuments and Other Nationally Important Archaeological Sites	Sets out criteria to protect these national heritage assets and their setting.
Historic Environment Policy 7 – Other Archaeological Resources	Requires development proposals to retain, protect and preserve in-situ and in an appropriate setting any archaeological resources affected by the proposal.
Historic Environment Policy 8 – Sites with Unknown Archaeological Potential	Requires development proposals on sites considered to have significant archaeological potential to be supported by an archaeological evaluation of the site, with appropriate archaeological mitigation then implemented.
Open Space Policy 2 - Protecting Other Important Open Space	Sets out criteria to protect formal and informal open spaces in public or private ownership. Proposals need to demonstrate that any affected open space "*is not of community value and has no other multifunctional purposes such as cultural, historical, biodiversity or local amenity value*". Where open space is affected, alternative provision and alignment with nature conservation management objectives is also required.
Waste Management Policy 1 - Waste Management Requirement for new Developments	Requires suitable waste management provision to be incorporated into proposals.

LDP Supplementary Guidance

4.4.9 A number of Supplementary Guidance (SG) documents were published following the adoption of the LLTNP LDP in 2016. The SGs are:

- Housing 2017;
- Design & Placemaking 2018; and,
- Developer Contributions 2018.

4.4.10 The SGs relevant to the proposed development is the Design and Placemaking SG and Developer Contributions SG. The Design & Placemaking SG provides siting and design guidance to ensure that all development proposals, including specifically "*holiday park developments*" are of high quality. In doing so the document identifies a range of detailed urban and environmental considerations for proposals in the National Park.

4.4.11 The Development Contributions SG identifies where developer contributions are likely to be sought by the LLTNPA in respect of proposals, depending on their scale, location, predicted impact and particular circumstances.

LDP Planning Guidance

4.4.12 In addition to statutory SGs, the adopted LDP is also supported by a suite of non-statutory Planning Guidance (PG) documents. The following approved PG documents are relevant to the proposed development:

- Listed Buildings and Conservation Areas Planning Guidance - sets out assessment criteria for proposals in the grounds of listed buildings, including the protection of key views and landscape setting;
- Visitor Experience Planning Guidance - defines different types of tourism accommodation and infrastructure. This PG does not set out criteria to assess tourism development proposals beyond repeating those within relevant LDP policies; and,
- Draft Sustainable and Active Travel Planning Guidance - guidance is about how development proposals can support the shift to active and sustainable travel. Travel plans aim to promote greener modes of transport and this guidance will help you create a travel plan. This guidance also gives developers and applicants further clarification on sustainable travel and improving active travel options for all development proposals.

4.5 Other Material Considerations

Overview

4.5.1 Other material considerations of relevance to the proposed development is the Loch Lomond & The Trossachs National Park Partnership Plan (2018 – 2023) and Draft National Planning Framework 4 (NPF4)

National Park Partnership Plan

4.5.2 All planning decisions within the LLTNP area require to be guided by the policies of the National Park Partnership Plan where relevant to ensure that decisions are consistent with the National Park's statutory aims (identified in **Section 4.2** above).

4.5.3 The National Park Partnership Plan 2018-2023 is an important material consideration in the determination of this PPiP application. It is framed around three thematic vision statements, 13 outcomes and numerous related priorities for the LLTNP. All three identified themes, Conservation and Land Management, Visitor Experience and Rural Development, are relevant to the proposed development. Many of the identified outcomes are also relevant, specifically:

- Outcomes 1, 2 and 3 seek to conserve and enhance the National Park's natural resources, special qualities and sense of place, whilst better mitigating and adapting to climate change;
- Outcomes 5 – 9 seek to enhance recreational opportunities of all kinds and enjoyment within the National Park, deliver a thriving visitor economy, and protect and enhance environmental quality, community life, health and wellbeing; and,

- Outcomes 10 – 12 seek to enhance the National Park's towns and villages through investment, strengthen and diversify the rural economy, realise sustainable business growth, and retain a larger skilled young and working age population.

4.5.4 To monitor its implementation, the National Park Partnership Plan (2018-2023) lists 14 targets for the LLTNP area over the period to 2023, of which the following are relevant to the proposed development:

- Increase the value of the visitor economy from 2016 STEAM baseline of £340m;
- Increase the proportion of people reporting a good quality experience of the National Park's settlements and landscapes;
- Reduce the proportions of people arriving in or exploring within the National Park by car and increase the proportion exploring by foot, water and bike, all from 2015/16 Visitor Survey baseline levels; and,
- Increase from 2016 baseline of 44% to 59% of water bodies achieving at least good ecological condition.

4.6 References

- Forestry Commission Scotland (2009) Scottish Government Control of Woodland Removal Policy.
- Great Britain Parliament. (1997) The Planning (Listed Buildings and Conservation Areas) (Scotland) Act (1997) as amended.
- Great Britain Parliament. (1997) The Town and Country Planning (Scotland) Act (1997) as amended.
- Historic Environment Scotland. (2016) Historic Environment Scotland Policy Statement.
- Scottish Government. (2013) Creating Places - A policy statement on architecture and place for Scotland.
- Loch Lomond and the Trossachs National Park Authority (LLTNPA). (2016) Loch Lomond and the Trossachs Local Development Plan 2017 – 2021.
- LLTNPA (2016). Loch Lomond and the Trossachs Local Development Plan 2017 – 2021 Supplementary Guidance and Planning Guidance.
- LLTNPA (2017). Loch Lomond and the Trossachs National Park Partnership Plan 2018 – 2027.
- Scottish Executive. (2000) Planning Advice Note 33 Development of Contaminated Land (2000).
- Scottish Executive. (2000, revised 2008) Planning Advice Note 60 Planning for Natural Heritage.
- Scottish Executive. (2001) Planning Advice Note 61 Planning and Sustainable Urban Drainage Systems.
- Scottish Executive. (2003) Planning Advice Note 68 Design Statements.
- Scottish Executive. (2005) Planning Advice Note 75 Planning for Transport.
- Scottish Executive. (Revised 2006) Planning Advice Note 51 Planning, Environmental Protection and Regulation.
- Scottish Executive. (2006) Planning Advice Note 79 Water and Drainage.
- Scottish Executive. (2007) Planning Advice Note 81 Community Engagement.
- Scottish Environment Protection Agency (SEPA). (2017) Development Management Guidance: Flood Risk.
- Scottish Government. (2015) Online Planning Advice regarding Flood Risk (2015) [accessed January 2018.
- Scottish Government. (2011) Planning Advice Note 1/2011 Planning and Noise.

- Scottish Government. (2011) Planning Advice Note 2/2011 Planning and Archaeology.
- Scottish Government. (2011) Planning Circular 3/2011: The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations.
- Scottish Government. (2013) Planning Advice Note 1/2013: Environmental Impact Assessment.
- Scottish Government. (2015) Scotland's Economic Strategy (2015).
- The Scottish Parliament. (2009) The Climate Change (Scotland) Act (2009).
- The Scottish Parliament. (2000) The National Parks (Scotland) Act (2000) as amended.
- The Scottish Parliament. (2011) The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations (2011) as amended.
- The Scottish Parliament. (2013) The Town and Country Planning (Development Management Procedure) (Scotland) Regulations (2013) as amended .
- Visit Scotland. (2016). Tourism Scotland 2020 and Tourism Development Framework.

5 Ecology

5.1 Introduction

5.1.1 This chapter of the EIAR provides an assessment of the likely significant effects from the Proposed Development on ecological features. The assessment is based on the characteristics of the site and surrounding area and the key parameters of the Proposed Development detailed in **Chapter 2 – Site and Proposed Development**. Other chapters relevant to this chapter include **Chapter 4 – Legislative and Planning Policy Context, Chapter 6 – Trees and Woodland, Chapter 9 – Ground Conditions and Geology, Chapter 10 – Water, Hydrology and Flood Risk, and Chapter 16 – Schedule of Mitigation and Monitoring.**

5.1.1 This chapter has been prepared by Applied Ecology Ltd in line with best practice. A statement outlining the relevant expertise and qualifications of competent experts appointed to prepare this EIAR is provided in **Appendix 1.1 – Project Team**.

5.1.2 This chapter is supported by a technical reports provided in **Appendix 5.1 (Ecology Technical Appendix)** and a schematic of the ecological footprint in **Appendix 5.2.**

5.2 Policy Context, Legislation, Guidance and Standards Legislation

5.2.1 Detailed information relating to planning policy can be found within **Chapter 4 – Legislative and Policy Context**. The chapter presented here has also been informed by relevant biodiversity legislation and policy, including European which has become subsumed into Scottish law post-Brexit, domestic environmental legislation, UK nature conservation policy and local biodiversity guidance. These include:

- The Conservation (Natural Habitats etc.) Regulations 1994 as amended, including amendments made in 2017 with limited relevance to Scotland, and as translated post-Brexit by the UK Withdrawal from the European Union (Continuity) (Scotland) Bill (2020);
- The Wildlife and Countryside Act (as amended) 1981;
- The Wildlife and Natural Environment Act (2011);
- The Nature Conservation (Scotland) Act 2004 (as amended);
- The Protection of Badgers (Scotland) (as amended) Act 1992;
- The Scottish Biodiversity List (SBL); and,
- The Dunbartonshire Local Biodiversity Action Plan (LBAP).

5.2.2 Further detail of relevant legislation and policy is provided in the Technical Appendices accompanying this chapter.

5.3 Scope of Assessment

Study Area

5.3.1 For the purposes of the assessment, the study areas referred to throughout the chapter vary by ecological feature. Investigations were carried out within the following buffers:

- Statutory designated site searches - 2 km from the Site, extended to 10 km for Natura 2000 sites for which screening for Habitats Regulations Assessment (HRA) was required;
- Existing faunal/flora records - 2 km from the Site;
- Bat surveys - within the Site;
- Other protected species surveys - Within 50-250 m of the Site depending on the species; and,
- Habitat surveys - within the Site.

Scoping and Consultation

5.3.2 Throughout the design process, a number of organisations were consulted to inform both the design and this assessment process. **Table 5-1** summarises consultation responses received. Responses listed in the table include those received via the Scoping Opinion and later discussions regarding survey scope and method.

Table 5-1: Scoping Response for Ecology

Consultee	Summary of Response	Where & How Addressed
NatureScot 15 July 2021	Unlikely to be any direct impacts on designated sites, but screening of the River Leven as a functional corridor for the Endrick Water SAC should be included in the assessment.	Screening and shadow HRA provided at Section 5.7.
	Ecological and arboricultural attributes of the site will require evaluation.	Ecological attributes included in full in this chapter.
	Proposed protected species survey suite provided during screening is supported.	Protected species listed during screening are assessed in full in this chapter where identified as an IEF.
The Woodland Trust 10 December 2021	Concerns regarding direct impacts on Ancient Woodland at Drumkinnon Wood, Woodbank House and the Boat House.	Incorporated into the EcIA at Section 5.6.14.
	Concerns regarding indirect impacts on Ancient Woodland arising from increased recreational use, pollution, changes in runoff, tree management for safety reasons and INNS.	Incorporated into the EcIA at Section 5.6.14.
	Do not consider active management to be compensation for loss of Ancient Woodland.	Noted.
	Lighting schemes must consider nocturnal and crepuscular species.	Incorporated into the EcIA at Section 5.6.44.
LLTNPA 27 July 2021	Scottish EUNIS is replacing JNCC Phase 1 and should include full consideration of Ancient Woodland ground flora indicator species. Development footprint to be overlain.	Scottish EUNIS habitat survey was undertaken, including vernal woodland survey - see **Appendix 5.1**. Development footprint overlay provided in **Appendix 5.2**.
	INNS should be mapped.	Maps provided in **Appendix 5.1**.
	TPO woodlands cover the Boathouse section of the Site.	Covered in **Chapter 6** of the EIAR.
	The Control of Woodland Removal policy will be relevant.	Covered in **Chapter 6** of the EIAR.
	The EcIA must consider the impact of fragmentation.	Incorporated into the EcIA at Section 5.6.14.
	Cumulative assessment is only needed for Traffic and Transport.	No ecological cumulative assessment is therefore presented here.

5.4 Methodology

5.4.1 This chapter has been informed by a suite of desk and field studies, further details of which are described below. The Ecological Impact Assessment (EcIA) has been undertaken in line with good practice guidance, also as described below.

5.4.2 The scope of desk and field studies were agreed with consultees during scoping, and as set out in **Table 5-1**.

Desk Study

5.4.3 In order to anticipate the potential ecological sensitivities associated with the Site, a desk study was conducted in advance of the field surveys. This included a review of:

- Existing data on statutory designated sites available through NatureScot Sitelink website for statutory designated sites up to 10 km from the Site;

- Records of Ancient Woodlands available from NatureScot (up to 2 km from the Site);
- The SBL; and,
- Records from Scottish Badgers (up to 2 km from the Site).

5.4.4 West Dunbartonshire Council has designated non-statutory nature conservation sites, and such sites within 2 km from the Site were extracted from the West Dunbartonshire Local Development Plan.

5.4.5 Other pre-existing biological data relevant to the Site were also searched for in online databases to which the authors had access and for which there were no copyright issues associated with their use in a commercial setting.

Field Survey

5.4.6 The EcIA presented here has been informed by a series of technical field studies, as described in **Appendix 5.1**. In summary, the surveys included:

- Habitats, including GWDTEs and those listed as Annex 1 Priority Habitats, and notable flora, including Invasive Non-Native Species (INNS);
- Otter;
- Water vole;
- Badger;
- Red squirrel
- Pine marten
- Bats;
- Breeding birds, and,
- Over-wintering birds.

Ecological Impact Assessment Methodology

5.4.7 The EcIA was undertaken following good practice guidelines current at the time of writing (CIEEM, 2018).

5.4.8 In summary, EcIA requires six steps:

- Identifying and characterising Important Ecological Features (IEFs);
- Identifying and characterising impacts and their effects;
- Identifying measures to avoid and mitigate effects;
- Assessing the significance of any residual effects after mitigation;
- Identifying appropriate compensation measures to offset significant residual effects; and,
- Identifying opportunities for ecological enhancement and monitoring.

Identifying Important Ecological Features (IEFs)

5.4.9 The sensitivity, value or importance of ecological features can be related to a wide range of ecosystem services that they can provide to the environment, people or wider society. These benefits can include the conservation of genetic diversity, people's enjoyment or understanding of biodiversity, or the health benefits of biodiversity. A summary of an approach to valuing ecological features in Scotland can be found in **Table 5-2**. The table shows how ecological importance can be ascertained using a combination of statutory measures (legally protected sites and species) and non-statutory but widely accepted measures, such as the presence of notable habitats and species listed in biodiversity lists of local Biodiversity Action Plans (LBAPs). Use can also be made of the Ratcliffe assessment criteria for the selection of sites with nature conservation value (Ratcliffe, 1977) and certain protected species have their own frameworks for the assessment of the importance of on-site populations. All these criteria can vary at different geographical scales.

Table 5-2: An approach to assessing Important Ecological Features in Scotland.

Level of Sensitivity or Value	Examples (Not Exhaustive)
International (Including European)	An internationally designated site or candidate site (SPA[2], proposed SPA (pSPA)[3], Special Area of Conservation (SAC)[4], candidate SAC (cSAC)[5], pSAC[6], Ramsar site[7], Biogenetic Reserve[8]) or an area which NatureScot has determined meets the published selection criteria for such designations, irrespective of whether or not it has yet been notified. A viable area of a habitat type listed in Annex 1 of the Habitats Directive, or smaller areas of such habitat which are essential to maintain the viability of that ecological resource. A regularly occurring population representing >1 % of the European resource of a species listed in Schedules 2 or 4 of the Habitat Regulations (As amended post-Brexit).
National	A nationally designated site (Site of Special Scientific Interest (SSSI)[9], National Nature Reserve (NNR)[10], Marine Nature Reserve) or a discrete area which NatureScot has determined meets the published selection criteria for national designation irrespective of whether or not it has yet been notified. A viable area of a priority habitat identified in the former UK BAP or Scottish Biodiversity List, or smaller areas of such habitat which are essential to maintain the viability of that ecological resource. A regularly occurring population representing >1 % of the national population of a nationally important species, i.e., a priority species listed in the former UK BAP or Scottish Biodiversity List and/or Schedules 1, 5 (S9 (1, 4a, 4b)) or 8 of the Wildlife and Countryside Act, or Schedules 2 or 4 of the Habitat Regulations (as amended post-Brexit). A regularly occurring and viable population of a UK Red Data Book species.
Council	Viable areas of key habitat identified in Council LBAP or Scottish Biodiversity List, or smaller areas of such habitats that are essential to maintain the viability of that ecological resource. Any regularly occurring, locally significant population of a species listed as being nationally scarce (occurring in 16-100 10 km squares in the UK) or in a relevant Council LBAP or Natural Heritage Zone profile on account of its rarity or localisation. Non-statutory designated wildlife sites including semi-natural ancient woodland greater than 0.25 ha. Networks of species-rich hedgerows.
Local	Locally important habitats or species such as: ▪ Semi-natural ancient woodland smaller than 0.25 ha;

[2] Special Protection Area classified under the EU Birds Directive for importance to birds.

[3] Potential Special Protection Area.

[4] Special Area of Conservation Area classified under the EU Habitats Directive for important habitat or non-bird species.

[5] Candidate Special Area of Conservation.

[6] Potential Special Area of Conservation.

[7] Wetland of international importance designated under the Ramsar Convention.

[8] Sites deemed representative examples of particular habitats in Europe.

[9] Site of Special Scientific Interest.

[10] National Nature Reserve.

Level of Sensitivity or Value	Examples (Not Exhaustive)
	▪ Features that are scarce within the local area or which appreciably enrich the local habitat resource e.g. networks of hedgerow/ditches not considered to be species-rich; and, ▪ Small populations of notable species (e.g., SBL or LBAP species) regularly resident on or using the site.
Site	Commonplace and widespread habitats or species which contribute to the functioning or value of the wider ecological landscape, such as: ▪ Scrub, poor semi-improved grassland, coniferous plantation woodland, intensive arable farmland etc.; and, ▪ Common and widespread faunal species, or occasional individuals of more notable species such as SBL or LBAP species, either resident on or using the site.

Identifying Impacts and Their Effects

5.4.10 Characterising impacts refers to the changes expected in the extent and integrity of an IEF. It takes into consideration the fact that different impacts on different IEFs can result in permanent or temporary effects of differing magnitudes, and this is also dependent on their timing and/or frequency of occurrence, and whether or not they can be reversed.

5.4.11 Impacts have been defined here as being high, medium, low or neutral, as summarised in **Table 5-3**. Impacts may be adverse (detrimental) or positive (beneficial).

Table 5-3: Criteria for Describing Impacts and Effects on Important Ecological Features

Impact Type	Description
High	High impacts may include those that result in large-scale, permanent (or at least the lifetime of the Proposed Development) changes in an IEF, and likely to change its ecological integrity. These impacts are likely to result in overall changes in the conservation status of a species population or habitat type at the location(s) or geographical scale under consideration.
Medium	Medium impacts may include moderate-scale, permanent (with respect to the lifetime of the Proposed Development) changes in an IEF, or larger-scale temporary changes, but the integrity of the feature is not affected. This may mean that there are temporary changes in the conservation status of a species-population or habitat type at the location(s) or geographical scale under consideration, but these are unlikely to be irreversible or long-term.
Low	Low impacts may include those that are small in magnitude, have medium-scale temporary changes, and where integrity is not affected. These impacts are unlikely to result in overall changes in the conservation status of a species population or habitat type at the location(s) under consideration, but it does not exclude the possibility that mitigation or compensation will be required.
Neutral	There is no perceptible change in the ecological feature.

5.4.12 Different impacts and their outcomes also have different probabilities of occurring. It is rarely possible to quantify probability accurately in the natural world in the absence of large, long-running data sets, and therefore for the purposes of this EcIA, probabilities are simply assessed qualitatively and relatively, using the terms defined in **Table 5-4** below.

Table 5-4: Criteria for Categorising the Probability of Effects Occurring

Probability	Description
Certain	It is reasonable to conclude that these effects will occur as a result of the proposals.
Likely	It is reasonable to conclude that these effects are more likely to occur than not occur.
Unlikely	It is reasonable to conclude that these effects are less likely to occur than to occur.

Significance of Effects

5.4.13 The 2018 CIEEM guidelines use only two categories to classify effects, namely those which are significant, and those which are not. In accordance with those guidelines, a "significant effect" in this assessment is one which supports (positive) or undermines (adverse) biodiversity

conservation objectives for a stated IEF, or for biodiversity generally if this is more relevant to the circumstances being assessed, in particular where the integrity of an IEF will be affected. These significant effects are considered by an ecological professional to be sufficiently important to warrant explicit assessment and reporting so that a decision-maker is adequately informed of the environmental consequences of a proposed project.

5.4.14 The significance of an effect on an IEF is given with reference to a specific spatial scale, which may or may not be related to the geographical scale used to define the IEF. The mitigation hierarchy (avoid, mitigate, compensate, enhance) may need to be applied, consistent with the scale at which the significant effect has been identified, in order to ameliorate any identified significant effects.

5.5 Baseline Conditions

Desk Study and Designated Sites

5.5.1 The findings of the desk study are as presented in **Table 5-5**.

Table 5-5: Summary of Desk Study

Source	Relevant Data
NatureScot	There was one statutory nature conservation site within 2 km of the Site, namely the Boturich Woodlands Site of Special Scientific Interest (SSSI), 1.3 km to the north. The SSSI designation is related to a mosaic of broad-leaved woodland, open areas of rough grassland and scattered scrub. Although located 8 km to the north of the Site and therefore not shown in **Appendix 5.1**, qualifying interests of the Endrick Water SAC are linked with the Site through the connectivity presented by Loch Lomond and the River Leven. The Endrick Water is both nationally and internationally important for its population of river lamprey *Lampetra fluviatilis* and brook lamprey *L. planeri*. These two lamprey species are the primary reasons for the selection of this site as an SAC, although Atlantic salmon *Salmo salar* is also present and listed as a qualifying feature. NatureScot soprano pipistrelle roost records for grid square NS3981; one roost in a domestic dwelling with 87 bats recorded in 2014, and a second domestic dwelling roost with 80 bats recorded in 2015.
WDC	Ten non-statutory LNCSs were located within 2 km of the Site. Part of the River Leven Corridor LNCS sits adjacent to the Site along its eastern boundary. The remaining LNCSs were located a considerable distance away or had no direct connectivity with the Site. Although in close proximity to the Site (100 m to the south-west), Stoneymallon Road Woodland LNCS was separated from the Site boundary by the A82 and therefore shared no connecting features.
Ancient Woodland Inventory	A number of areas listed on the Ancient Woodland Inventory were present within 2 km of the Site, including areas within or immediately adjacent to the Site boundary. Drumkinnon Wood, between the two main sections of the Site, and the area of woodland around Woodbank House in the west of the Site, are listed on the AWI as long-established ancient woodlands of plantation origin. Although likely historically planted, both these areas of woodland now have characteristics of well-established semi-natural woodland. The boundary of the Boathouse section of the Site (to the north) also partially contained woodland listed on the AWI as long-establish woodland of plantation origin. However, during the surveys described in **Appendix 5.1**, it was found that this area actually contained early successional scrub woodland, and that the longer-established woodland ran along its boundary.
GMRC	Data records for which there were no copyright issues were found for the Site dating between 2010-2021: ▪ A dead otter north of Duck Bay, in 2014; ▪ One record of red squirrel, dating from 2019 and located from behind the National Park Centre, 500 m south-east of the Site; ▪ A single record for pine marten dating from 2010 within Balloch Country Park, 600 m north of the Site on the opposite side of the River Leven; ▪ Records for 72 species of birds, 44 of these occurred in the breeding season (March – August) although 11 were unlikely to have bred due to lack of suitable habitat (e.g. glaucous gull and guillemot), or were late over-wintering birds. Breeding season

Source	Relevant Data
	records of notable species not recorded during the field surveys included cuckoo, house martin and osprey. ■ 26 species of aquatic birds during the winter periods (September – February); 17 of these species were recorded during field surveys but other, scarcer species not recorded included Icelandic gull, velvet scoter, scaup, black guillemot and little auk.
WeBS	Thirty-two species of wildfowl, waders and other aquatic birds were reported within the River Leven – Balloch to Dumbarton WeBS dataset between 2015 and 2020. The two most commonly reported species were black-headed gull with a 5-year average (2015-20) peak of 192 birds and mallard with a five-year average of 113 in the same period. However, these numbers are for the whole River Leven – Balloch to Dumbarton WeBS count area of which the Site forms a very small part.
SSRS	SSRS database had no confirmed red squirrel sightings within any parts of the Site. However, the database contained a large number of sightings of red squirrel within the wider area, most notably within Balloch Country Park, across the River Leven from the Site. Red squirrel have also been consistently recorded in recent years within woodland along Stoneymollan Road, 200 m to the south-west of the Site and across the A82. The closest record to the Site was a recent red squirrel sighting submitted in July 2021, 150 m south of the Woodbank section of the Site. A second sighting within close proximity to the Site was submitted in 2015 directly south of the Site at Balloch train station. There were many records of grey squirrel sightings within the SSRS database for both Drumkinnon Wood and the Boathouse area of the Site, the most recent of which was February 2021.
Scottish Badgers	Scottish Badgers confirmed a general absence of data records for the Site and wider area.
EnviroCentre reports from 2017/2018	No otter, badger, pine marten, red squirrel or water vole signs were identified during surveys undertaken for the Site by Envirocentre in 2017. No roosting bats were identified during surveys undertaken by EnviroCentre.

Field Survey

Scottish EUNIS, GWDTEs and Notable Flora

5.5.2 Full details of the habitat survey results can be found in **Appendix 5.1**. Approximately half of the Site comprised woodland or scrub habitats, including mixed broad-leaved woodland at Riverside and around Woodbank House, and mixed and broad-leaved plantations around Loch Lomond Shores. The mixed broad-leaved woodlands frequently supported an understorey of invasive non-native species, including Spanish and hybrid bluebells at Riverside, and rhododendron and bamboo at Woodbank House. Drumkinnon Wood, lying outwith the Site, had a notable carpet of native bluebell. Areas of willow, bramble and mixed scrub occurred around Woodbank House.

5.5.3 The other main habitat type present within the Site were grasslands, including mown amenity species-poor swards in the woodland clearing at Riverside, and abandoned pasture to the east of Woodbank House. Bare ground and surface waters typically occurred around the loch shoreline.

5.5.4 Habitats considered to be of Local importance or greater were considered to be IEFs and included in this EcIA. All other habitat types were not considered to be IEFs, and have been discounted from the assessment.

5.5.5 No GWDTEs were present within the Site.

Otter

5.5.6 Details of the otter survey can be found in **Appendix 5.1**. Otters are known to use the shores of Loch Lomond in areas north of the Study Area. However, the surveys undertaken in 2021 indicated that otter were unlikely to be present within the Site, and habitat within the Site and the wider Study Area only offered potential commuting and foraging routes. The majority of these locations were classed as being sub-optimal for the species due to high levels of disturbance. Higher quality foraging and commuting habitat was identified along the western side of the River Leven, but this was also heavily disturbed by boats from the marina and general public.

5.5.7 The Site was considered to be of Site level importance for the species at best, but given the level of protection afforded to otter, the species will be considered to be an IEF in the EcIA.

Water Vole

5.5.8 Details of the water vole survey can be found in **Appendix 5.1**. Water voles were judged to be absent from the Site and Study Area and there was limited habitat suitability for colonisation by the species in the future. For the purposes of the EcIA, water vole was not considered to be an IEF and has therefore been scoped out of the assessment.

Badger

5.5.9 Details of the badger survey can be found in **Appendix 5.1**. Badger foraging activity was confirmed in the west of the Site, with badgers likely accessing the Site from higher quality, connected habitat to the north and north-west. The majority of the woodland cover in the Site was judged to be unsuitable for badger sett creation, and there were high levels of disturbance from humans and dogs within Drumkinnon Wood and in the woodland areas in the far east of the Site. Wooded slopes around Woodbank House offered the best habitat for sett creation within the Site but no setts were found. However, badger were utilising the adjacent field for foraging.

5.5.10 The Site was considered to be at best of Site level importance for the badger but given the frequenting of habitats within the west of the Site by badger, the species will be considered to be an IEF in the EcIA.

Red Squirrel

5.5.11 Details of the red squirrel surveys can be found in **Appendix 5.1**. When combining the various findings from surveys undertaken, grey squirrel were found to be abundant and frequent within the Woodbank woodland and the southern end of Drumkinnon Wood. Sightings of grey squirrel were made close by to dreys recorded in the woodland south of the Ben Lomond Way roundabout and the Riverside area of the Site.

5.5.12 Two red squirrels were sighted on a single occasion within a narrow woodland strip along Old Luss Road. This was notable given that there were no previous records of red squirrels within any parts of the Site. There were no dreys in the immediate area surrounding the location of the sighting, but a single drey was located in the southern end of the woodland block south of the Ben Lomond Way roundabout. Other dreys recorded were in areas where higher levels of grey squirrel activity were recorded, either during the transects or on the camera traps, with the exception of the centre of Drumkinnon Wood where there was seemingly no squirrel activity.

5.5.13 It was considered likely that the majority, if not all, of the dreys within the Site were being used by grey squirrels rather than by reds, and that the red squirrels sighted were vagrant reds occasionally moving in from areas to the north to feed. The section of woodland where the sighting took place was relatively isolated and fragmented, and only included a single drey to the south, but there was connectivity with woodland cover to the north. Nevertheless, it is not possible to confirm conclusively that all dreys within the Site were being used by grey squirrels, and therefore in line with NatureScot guidance, in areas where both red and grey squirrels have been recorded all dreys should be treated as if they are protected, unless it can be demonstrated beyond reasonable doubt that the drey is only being used by grey squirrels.

5.5.14 In the Riverside section of the Site and the southern end of Drumkinnon Wood, grey squirrels were consistently observed in areas close to dreys. In the context of the surrounding habitat, it was presumed that these parts of the Site did not support red squirrel.

5.5.15 The woodland block south of the Ben Lomond Way roundabout only contained a single drey, where a grey squirrel was observed in close proximity during the walked transects. However, this drey was within the same woodland strip as the red squirrel sighting. Grey squirrels were frequently recorded within the Woodbank woodland, both during transects and at feeder stations. There was a substantial network of dreys within this woodland and habitats here were better connected to the wider area, including being in relatively close proximity to the red squirrel sighting.

5.5.16 Red squirrel will therefore be considered a Council level IEF in the EcIA.

Pine Marten

5.5.17 Details of the pine marten survey can be found in **Appendix 5.1**. Although suitable habitat for pine marten was identified within the woodland in the west of the Site, no signs of the species were confirmed. Suitable habitat within the wider Study Area was also separated from the Site by the River Leven in the east and the A82 in the west and located a considerable distance from the Site. Pine marten are shy creatures and not tolerant of disturbance. The level of disturbance caused by the volume of people and dogs that currently access the Site, combined with the isolated nature of the majority of woodland habitat in the Site, lack of signs found, and absence of any recent data records or road casualty data, means that pine marten is unlikely to be present within the Site.

5.5.18 For the purposes of the EcIA, pine marten is not considered to be an IEF needing to be included in the assessment.

Bats

5.5.19 Details of the bat surveys can be found in **Appendix 5.1**. With respect to foraging and commuting bats, the survey data collected throughout 2021 via static detectors, manual transects and activity surveys, showed that the Site was well-used by a range of bat species, the majority of which were soprano and common pipistrelles, along with brown long-eared bats and *Myotis* spp.. Intense foraging behaviour by multiple bats was witnessed during manual transects along existing dark corridors in the Riverside and Pierhead areas of the Site. Static monitoring confirmed regular, high volume foraging activity across the Site, but particularly at the Boathouse area and the Pierhead. Observations during activity surveys on buildings at Woodbank confirmed roosts within the buildings, as well as bats using the woodland edges and tree canopies for foraging and socialising.

5.5.20 A total of five building bat roosts were identified. Four of these were within Woodbank House and one was within the structure referenced as Building B, all being individual pipistrelle bats utilising the abundance of stone crevices available within these structures. No same roost location was used twice across all of the surveys, suggesting that pipistrelle bats were using a number of roost locations across the buildings depending on factors such as weather and time of year. No confirmed evidence of hibernation was found during surveys over the winter of 2021/2022. There were however significant limitations to the hibernation surveys due to the unsafe nature of the structures leading to an inability to inspect the majority of crevices, as well as the unusually mild weather during that particular winter survey period.

5.5.21 The preliminary roost assessment (PRA) of trees within the Site identified 87 trees that displayed bat roost suitability, and further at height or aerial survey work will be necessary at detailed design to establish whether or not any of the trees with bat roosting suitability do indeed support any bat roosts. Based on the results of the tree PRA, the highest impact on potential roosts in trees will likely to be within the Woodbank woodland. The results of the tree PRA and activity recorded during static monitoring, activity surveys, and hibernation monitoring, suggested that bats were highly active in and around the Woodbank woodland and it is therefore particularly likely that bats will be utilising tree roosts in this part of the Site.

5.5.22 Based on the findings of the surveys, bats are included in this EcIA as an IEF of Council level importance.

Breeding Birds

5.5.23 Details of the breeding bird survey can be found in **Appendix 5.1**. Although the surveys identified some scarcer passerines such as wood warbler and redstart as being present on the Site, most of the species breeding there were common and typical of woodland and garden habitats. Clusters of bird activity were related to where count points coincided with habitat boundaries such as woodland/scrub edges or features such as hedges which provide good nesting and feeding opportunities for birds.

5.5.24 Nevertheless, over 40 % of the species assemblage was comprised of red- or amber-listed species of conservation concern, and therefore birds in the breeding season at the Site will be considered as being an IEF of Local importance in the EcIA.

Over-Wintering Birds

5.5.25 Details of the over-wintering bird survey can be found in **Appendix 5.1**. The surveys showed that the Site and/or Study Area held relatively low numbers of aquatic wintering birds and most species recorded were mainly common and widespread. Based on these findings, over-wintering birds were not considered to be an IEF needing to be included in the EcIA.

Modifying Influences (Future Baseline in the Absence of Development)

5.5.26 The dynamic nature of the natural environment means that the ecological features associated with the Site will continually change over time. In the absence of the Proposed Development, the primary process by which the Site's ecological status would most likely change would be continual deterioration in the condition of derelict buildings on the Site, and unchecked encroachment of INNS. These activities may affect a range of habitats and the use of the Site by protected species.

Implications of Climate Change

5.5.27 According to the UK Climate Change Projects 2018 (UKCP18) summary for West Dunbartonshire and the LLTNP, it is anticipated that summer temperatures and winter precipitation are both expected to increase. Additionally, extreme weather events are likely to increase in both frequency and intensity. These longer-term changes are predicted to cause range shifts in some species and may alter habitat composition and health of the plant communities present. The suitability of the Site may therefore change for some of the species which are currently present, and new, different species may colonise. The baseline surveys carried out for this EIAR represent a snapshot of ecological composition and activity present at the time of survey, and cannot be extrapolated to predict future population trends in the event of climate change.

Assumptions and Limitations

5.5.28 While every attempt was made to collect accurate baseline data for this EIAR, as identified above all ecological surveys represent a 'snapshot' of activity. Ecological features are dynamic and often transient, and it is rarely possible to confirm the absence of a species through survey. It may be necessary to update ecological surveys prior to construction, and data presented in this chapter should not be used for long-term analysis of species distribution or occurrence. However, it is considered that sufficient data have been collected for the assessment purposes of this EcIA.

5.5.29 Species or habitat specific limitations are discussed further in **Appendix 5.1**.

Identification of Important Ecological Features (IEFs)

5.5.30 Based on the criteria given in **Table 5-2**, summaries of the IEFs identified in **Appendix 5-1** are presented in **Table 5-6** for designated sites, **Table 5-7** for habitats, and **Table 5-8** for faunal species. All other ecological features have been scoped out of this assessment (see summaries above and **Appendix 5-1** for more details).

Table 5-6: Summary of Designated Sites IEFs

Site	Value	Rationale
Endrick Water SAC	International	Designated and protected under international legislation.
Boturich Woodlands SSSI	National	Designated and protected under national legislation.
River Leven Corridor LNCS	Council	Council-level non-statutory designation.
Ancient Woodland	Council	Ancient woodland areas over 2 ha in area.

Table 5-7: Summary of Habitat IEFs

Habitat Type	Value	Rationale
Surface Standing Waters	Local	Commonplace habitat but important as part of a large, notable features within the wider ecological landscape.
Abandoned Pasture	Local	Commonplace habitat but relatively species-rich when unmown, providing linkages between areas of lower value, and therefore important within the wider ecological mosaic.

Habitat Type	Value	Rationale
Mixed Scrub	Local	Commonplace habitat important to the mosaic of habitats associated with adjacent woodland, and important as a connecting feature within the overall ecological landscape, associated with open grassland habitat.
Mixed Broad-Leaved Woodland	Council	Woodland habitat included within the Dunbartonshire LBAP. Important as a connecting feature within the overall ecological landscape and contains diverse ground flora, including areas of native bluebell, as well as many mature trees.
Tree Lines	Local	Mature, long-standing habitats in the west of the Site likely to be originally of plantation origin but now important as a connecting feature within the overall ecological landscape.

Table 5-8: Summary of Faunal IEFs

Species/Species Group	Value	Rationale
Otter	Site	Unlikely to be resident but may on occasion frequent the loch shoreline at the edge of the Site.
Badger	Site	Unlikely to be resident but known to use parts of the Site for foraging.
Red squirrel	Council	Known to be using the Site but residency status is not conclusively known. Impact assessment will need to be precautionary. Grey squirrel resident.
Bats	Council	High levels of foraging activity from a variety of common bat species, and a number of roost locations. Bats are listed as priority species in the SBL, and within the Dunbartonshire LBAP.
Breeding birds	Local	A typical assemblage of common woodland birds but a relatively high proportion of species listed as amber or red species of conservation concern.

5.6 Assessment of Effects

Zone of Influence

5.6.1 The study area for this assessment has been defined by determining the zone of influence of the Proposed Development in relation to each of the identified IEFs, including the extent to which direct effects caused by land take and habitat loss may be experienced by those IEFs and the extent of indirect effects, such as an IEF's prey species being affected by the Proposed Development.

5.6.2 The zone of influence is different for each of the IEFs assessed and therefore a separate study area has been defined for each.

Embedded Mitigation

5.6.3 This assessment of impacts and their effects has been undertaken in the context of the application of embedded mitigation which will reduce impacts associated with both construction and operation of the Proposed Development. This embedded mitigation includes avoidance of IEFs during the design process, and the implementation of standard best practice mitigation during construction.

Mitigation by Design

5.6.4 During the design process, various factors were taken into consideration in order to minimise potential impacts on IEFs. These can be summarised as:

- Exclusion of all previously proposed works from Drumkinnon Wood; and,
- Minimisation of tree removal at Woodbank House.

Best Practice During Construction

5.6.5 An Ecological Clerk of Works (ECoW) will oversee all stages of construction, to ensure that good practice measures with regards to ecology are implemented. Other good construction practice measures will be incorporated into the Construction Environmental Management Plan (CEMP) for the Proposed Development. These can be summarised as:

- Work areas will be carefully marked out and delimited on the ground, with the assistance of the ECoW, to ensure no extraneous habitat loss. Temporary fencing will be used to ensure that plant and operatives do not encroach further than is necessary into ecologically sensitive areas;
- General good practice measures for working in and near to watercourses and waterbodies will be adhered to, for example, during construction, silt interception traps will be provided to minimise unchecked contaminated run-off. Appropriate temporary drainage solutions must be designed and installed. Detailed drainage designs will require review and approval by the scheme Environmental Manager (and ECoW as required), and appropriate drainage measures will be installed in advance of major ground-breaking works. A pollution prevention plan will be included in the CEMP;
- Fuels and other chemicals will be stored securely within the site construction compound;
- Appropriate wash-out facilities will be available for vehicles and machinery;
- Trenches and excavations will be covered at the end of each working day, or will include ramps, and stored pipes will be capped, to prevent entrapment of animals;
- If construction work is carried out during the hours of darkness, machinery and floodlights will be directed away from watercourses and woodland edges. Use of heavy machinery and pile drivers will be limited to avoid two hours before and after dawn and dusk within 30 m of watercourses, waterbodies or woodland edges; and,
- A site speed limit of 10 mph for all construction traffic will be in place to protect badger, red squirrel and otter.

Construction Phase Effects

5.6.6 Potential direct effects of construction include:

- Direct loss of habitat through land take for construction of built features and associated infrastructure; and,
- Direct loss or harm of species through felling and other construction activities.

5.6.7 Potential indirect effects of construction include:

- Changes to the existing hydrology that could lead to detrimental changes in quality or availability of surface waters;
- Increased pollution risk associated with accidental spillage of fuels, oils, and increases in silt laden run-off and dust emission; and,
- Disturbance effects to faunal species.

5.6.8 Using GIS, the Proposed Development footprint was overlain on the Scottish EUNIS Habitat Map to calculate the extent of habitat lost directly to construction. Construction footprints supplied for this purpose accounted for instances where felling or construction may lead to increased direct impacts.

5.6.9 Indirect impacts on habitats and species are less easy to quantify. The zones of influence of construction activities, or disturbance to species, can be site-, species- or disturbance source-specific, as can be fragmentation effects. Indirect effects are therefore discussed at a qualitative level through consideration of the habitat and species maps and development layout.

Designated Sites

5.6.10 Potential construction phase impacts and effects on designated sites are summarised in **Table 5.9** below.

5.6.11 With regards to the Endrick Water SAC, the Proposed Development is < 5 m from a habitat feature (the River Leven) on which qualifying features of the SAC are dependent. There is therefore the potential for the Proposed Development to affect the qualifying interest features of this site, namely Atlantic salmon and lamprey species, during their migratory phases. During the construction phase, impacts on the River Leven, for example through uncontrolled run-off containing silt, hydrocarbons or other pollutants, could decrease the attractiveness of the watercourse for migratory fish. Prior to mitigation, these would be temporary adverse effects, significant at a Local level.

5.6.12 Due to the separation distance between the Site and the Boturich Woodlands SSSI, no construction phase impacts are predicted for the SSSI.

5.6.13 With respect to the River Leven LNCS, the potential impacts on water quality identified for the SAC above would also be relevant. There may also be disturbance of species for which the LNCS has been designated, as a result of noise during the construction phase. These would be temporary adverse effects, significant at the Site level.

5.6.14 Impacts on Ancient Woodlands include direct loss of woodland, fragmentation effects, disturbance of ground flora and impacts on root protection zones for trees associated with the Ancient Woodland. Around Woodbank House, woodland loss will result in adverse effects significant at the Council level, but the removal of invasive non-native species would constitute a positive effect, significant at the Local level. Impacts on ground flora and individual trees would be adverse effects significant at the Local or Site level.

Table 5-9: Summary of Likely Construction Phase Impacts and Effects on Designated Sites Prior to Mitigation

IEF	Importance Level	Impacts	Effects	Impact Scale and Certainty	Effect Significance Prior to Mitigation
Endrick Water SAC	International	Pollution (silty run-off or other contaminants)	Decrease in water quality	Low, adverse impact; temporary, likely.	Adverse effect, significant at a **Local** level.
Boturich Woodlands SSSI	National	None	n/a	n/a	No significant effect.
River Leven Corridor LNCS	Council	Pollution (silty run-off or other contaminants)	Decrease in water quality	Low, adverse impact; temporary, likely.	Adverse effect, significant at a **Site** level.
		Noise disturbance	Reduced survival or breeding success of species associated with the LNCS.	Low, adverse impact; temporary, likely.	Adverse effect, significant at a **Site** level.
Ancient Woodland	Council	Construction of buildings and infrastructure.	Direct loss of 0.48 ha of Ancient Woodland habitat	Medium, adverse impact; permanent, certain.	Adverse effect significant at a **Council** level.
		Removal of INNS	Restoration of native ground flora	Medium, positive impact; permanent, likely.	**Positive** effect significant at a **Local** level.
		Compaction of root zones	Decreased infiltration rates and effects on tree health	Low, adverse impact, permanent, likely.	Adverse effect significant at a **Site** level.
		Disturbance of ground flora	Fragmentation	Low, adverse impact, permanent and likely.	Adverse effect significant at a **Local** level.

IEF	Importance Level	Impacts	Effects	Impact Scale and Certainty	Effect Significance Prior to Mitigation
			Deterioration in quality of ground flora.	Low, adverse impact, permanent and likely.	Adverse effect significant at a **Site** level.

Habitats

5.6.15 Potential construction phase impacts and effects on habitats are summarised in **Table 5.10** below. Of the c. 19 ha Site, 11.35 ha will be retained as the existing habitat mosaic. Of the 7.63 ha which will be lost to the Proposed Development, nearly two-thirds of the footprint will be associated with habitats not considered to be IEFs (4.92 ha, 64.6 %). Of the IEFs which will be impacted, the majority of the direct habitat loss will be either mixed broad-leaved woodland (17.4 %) or abandoned pasture (14.7 %). Smaller losses are anticipated for surface standing waters, and mixed scrub, as well as impacts associated with fragmentation and/or disturbance. For all habitats except mixed broad-leaved woodland, prior to mitigation these construction phase impacts will be significant at the Site level. For the mixed broad-leaved woodlands, direct impacts are assessed as being significant at the Council level given the hectarage involved and the importance level of this feature. Fragmentation impacts are considered to be significant at the Site level.

5.6.16 The construction phase of Zone E (Woodbank) and Zone B (Riverside) will first involve the clearance of INNS, resulting in the clearance of 0.27 ha of dense bamboo, 1.2 ha of dense and more scattered stands of rhododendron, 0.16 ha of cherry laurel and 2.5 ha of hybrid/Spanish bluebell. This is considered to be a positive effect, significant at the local level.

Table 5-10: Likely Construction Phase Impacts and Effects on Habitat IEFs Prior to Mitigation

IEF	Importance Level	Impacts	Effects	Impact Scale and Certainty	Effect Significance Prior to Mitigation
Surface standing waters	Local	Construction of buildings and infrastructure.	Direct loss of 0.06 ha (0.8 % of footprint).	Low, permanent, certain.	Adverse significant effect at the **Site** level.
			Fragmentation	Low, permanent, unlikely.	No significant effect.
		Changes in quality or quantity of hydrological regime.	Pollution, droughting or flooding of habitats.	Low, permanent and temporary, likely.	Adverse significant effect at the **Site** level.
Abandoned pasture	Local	Construction of buildings and infrastructure.	Direct loss of 1.12 ha (14.7 % of footprint).	Medium, permanent, certain.	Adverse significant effect at the **Site** level.
			Fragmentation	Low, permanent, likely.	No significant effect.
		Compensatory planting.	Direct loss of 1.11 ha.	Medium, permanent, certain.	Adverse significant effect at the **Site** level.
Mixed scrub	Local	Construction of buildings and infrastructure.	Direct loss of 0.19 ha (2.5 % of footprint).	Low, permanent, certain.	Adverse significant effect at the **Site** level.
			Fragmentation	Low, permanent, likely.	No significant effect.
		Compensatory planting.	Direct loss of 0.05 ha.	Low, permanent, certain.	No significant effect.
Mixed broad-	Council	Construction of buildings and infrastructure.	Direct loss of 1.33 ha (17.4 % of footprint).	Medium, permanent, certain.	Adverse significant effect

IEF	Importance Level	Impacts	Effects	Impact Scale and Certainty	Effect Significance Prior to Mitigation
leaved woodland					at the **Council** level.
			Fragmentation	Medium, permanent, certain.	Adverse significant effect at the **Site** level.
			Clearance of INNS	High, permanent, certain	**Positive** significant effect at the **Local** level.
Tree lines	Local	Construction of buildings and infrastructure.	No effect anticipated.	n/a	No significant effect.

Otter

5.6.17 Potential construction phase impacts and effects on otter are summarised in **Table 5.11** below. Otters are not resident on the Site, but there remains a possibility that they may occasionally use habitats within Zone D (the Boathouse), Zone C (the Pierhead) or Zone B (Riverfront) when foraging or commuting. This may bring them into contact with construction activities or be susceptible to impacts arising from decreases in water quality. Although the majority of these impacts will be avoided through the implementation of the embedded mitigation, impacts on otter have been assessed precautionarily as being significant at the Site level with respect to disturbance and/or changes in water quality, within the three zones identified above.

Badger

5.6.18 Potential construction phase impacts and effects on badgers are summarised in **Table 5.11** below. Badgers are not currently resident on the Site but they use habitats within Zone D (Staff Area) and Zone E (Woodbank) for foraging. Badgers are not expected to be active at the times of day when the majority of construction activities will be undertaken, but there will be a loss of foraging habitat in Zone E (Woodbank), as well as the likely interruption of traditionally used commuting routes. These adverse impacts have been assessed as being significant at the Site level within Areas D and E.

Red Squirrel

5.6.19 Potential construction phase impacts and effects on red squirrel are summarised in **Table 5.11** below. Red squirrels are assumed to be absent from Zones A, B and C, but present within Zones D and E on a transitory basis. Although no red squirrel dreys were conclusively confirmed within either of these Zones, the sighting of red squirrel in these areas requires a precautionary approach to the assessment of impacts and effects.

5.6.20 Any tree removal within these areas could potentially affect red squirrel dreys, either directly through down-takings, or indirectly through noise and vibration disturbance. Tree and vegetation removal will also decrease the availability of foraging habitat. Given that the Site appears to be on the edge of an ecological landscape suitable for red squirrel, and the conservation importance of this species, prior to mitigation impacts on red squirrel within Zones D and E are considered to be adverse, significant at the Local level.

Bats

5.6.21 Potential construction phase impacts and effects on bats are summarised in **Table 5.11** below. Impacts on bats will potentially occur throughout all the Zones comprising the Site. Impacts on building roosts will be confined to Zone E (Woodbank) and are considered to be an adverse impact significant at the Site level. Prior to detailed design, proposed tree down-takings will include six trees with high bat roost suitability (BRS), 13 with moderate BRS and nine with low BRS, the majority of which will be within Zone E (Woodbank). Indirect construction phase disturbance impacts, assuming a maximum zone of influence of c. 20 m, will affect a further four trees with high BRS, 37 trees with moderate BRS and 13 trees with low BRS. In total, 82 trees with bat roost suitability will be affected, 65 % of which are in Zone E (Woodbank). Collectively,

and on a precautionary basis, these disturbance construction phase impacts are considered to be adverse and significant at the Local level.

Table 5-11: Trees With Bat Roost Suitability Affected Directly and Indirectly During the Construction

Area	Number of Trees Affect by Direct Loss (BRS)			Number of Trees Affected by Indirect Disturbance Impacts (BRS)			Total
	High	Moderate	Low	High	Moderate	Low	
Zone A	0	0	0	0	0	0	0
Zone B	0	2	5	1	8	0	16
Zone C	0	0	0	0	0	0	0
Zone D	0	3	3	0	4	0	10
Zone E	6	6	1	3	25	12	53
Area 11	0	2	0	0	0	1	3
Total	6	13	9	4	37	13	82

Breeding Birds

5.6.22 Potential construction phase impacts and effects on breeding birds are summarised in **Table 5-12** below. The clearance of vegetation will have direct effects on nesting birds if present at the time the works are carried out, as well as indirect disturbance effects. This will be predominantly within Zone D (Staff and Service Area) and Zone E (Woodbank). However, these impacts could occur in any location where vegetation is removed, and would represent an adverse effect, significant at the Site level.

Table 5-12: Likely Construction Phase Impacts and Effects on Faunal Species Prior to Mitigation

IEF	Importance Level	Impacts	Effects	Impact Scale and Certainty	Effect Significance Prior to Mitigation
Otter	Site	Collision with plant.	Injury or death.	Low adverse impact; temporary; unlikely.	No significant effect.
		Excavations	Entrapment	Low adverse impact, temporary, unlikely.	No significant effect.
		Noise, vibration or lighting.	Disturbance – reduced survival/ reproduction rates.	Low adverse impact, temporary, unlikely.	Adverse significant effect at the **Site** level.
		Changes in quality or quantity of hydrological regime.	Reduced foraging habitat – reduced survival/ reproduction rates.	Low adverse impact, temporary, unlikely.	Adverse significant effect at the **Site** level.
Badger	Site	Collision with plant.	Injury or death.	Low adverse impact; temporary; unlikely.	No significant effect.
		Loss of foraging habitat.	Reduced survival/ reproduction rates.	Low adverse impact; certain, permanent.	Adverse significant effect at the **Site** level.
		Severance of traditional foraging/	Reduced survival/ reproduction rates.	Low adverse impact; permanent; likely.	Adverse significant effect at the **Site** level.

IEF	Importance Level	Impacts	Effects	Impact Scale and Certainty	Effect Significance Prior to Mitigation
		commuting routes.	Increased risk of RTAs Entrapment.		
		Noise, vibration or lighting.	Disturbance – reduced survival/ reproduction rates.	Low adverse impact; temporary; unlikely.	No significant effect.
Red squirrel	Council	Loss of dreys.	Reduced survival/ reproduction rates.	Low adverse impact; likely (precautionarily); permanent.	Adverse significant effect at the **Local** level.
		Loss of foraging habitat.	Reduced survival/ reproduction rates.	Low adverse impact; likely (precautionarily); permanent.	Adverse significant effect at the **Local** level.
		Noise, vibration or lighting.	Disturbance – reduced survival/ reproduction rates.	Low adverse impact; likely (precautionarily); permanent.	Adverse significant effect at the **Local** level.
Bats	Local	Loss of building roosts	Reduced survival/ reproduction rates.	Low adverse impact; certain, permanent.	Adverse significant effect at the **Site** level.
		Loss of tree roosts	Reduced survival/ reproduction rates.	Medium adverse impact; likely (precautionarily); permanent.	Adverse significant effect at the **Local** level.
		Severance of foraging/ commuting routes.	Altered opportunities for foraging.	Medium adverse impact; certain, permanent.	Adverse significant effect at the **Local** level.
		Noise, vibration or lighting.	Disturbance – reduced survival/ reproduction rates.	Low adverse impact; likely, temporary.	Adverse significant effect at the **Local** level.
Breeding birds	Local	Loss of breeding/ feeding habitat for construction.	Reduced survival/ reproduction rates.	Medium adverse impact; certain, permanent.	Adverse significant effect at the **Site** level.
		Noise, vibration or lighting.	Disturbance – reduced survival/ reproduction rates.	Medium adverse impact; certain, temporary.	Adverse significant effect at the **Site** level.

Construction Phase Mitigation Measures

5.6.23 It will be possible to reduce some of the identified construction phase impacts and their effects during detailed design.

Designated Sites

5.6.24 With respect to Ancient Woodland, work areas will be tightly contained to avoid unnecessary encroachment into ecologically sensitive areas, including the fencing off and clear signage of no-go zones.

5.6.25 A formal Ancient Woodland Restoration Plan will be devised for the Ancient Woodland within Zone E (Woodbank). This will include:

- a formal eradication programme for INNS, resulting in the clearing of 0.27 ha of dense bamboo, 1.2 ha of dense and more scattered stands of rhododendron, and 0.16 ha of cherry laurel; and,
- Method statements for the approach to be used to clearing ground flora within the Ancient Woodland in locations where lodges and bothies will be sited, and the safe storage of the scraped soil and seed bank for translocation into areas previously affected by INNS. However, all soils where INNS have been present should be disposed of off-site.

5.6.26 Longer-term management of the Ancient Woodland is considered in operational phase mitigation below, via a Landscape and Biodiversity Management Plan.

5.6.27 With respect to the River Endrick SAC, the following construction phase mitigation will be implemented:

- General good practice measures for working in and near to watercourses and waterbodies will be adhered to, as per the embedded mitigation described above. A pollution prevention plan will be included in the CEMP, fuels and other chemicals will be stored securely within the site construction compound, and appropriate wash-out facilities will be available for vehicles and machinery; and,
- If construction work is carried out during the hours of darkness, machinery and floodlights will be directed away from the River Leven, which must not be directly lit.

5.6.28 The above mitigation for the River Endrick SAC will also be applicable to the River Leven LNCS.

Habitats

5.6.29 The following mitigation, enhancement or compensation will reduce construction phase impacts and effects on habitat IEFs:

- General good practice measures for working in and near to watercourses and waterbodies will be adhered to, as per the embedded mitigation described above. A pollution prevention plan will be included in the CEMP, fuels and other chemicals will be stored securely within the site construction compound, and appropriate wash-out facilities will be available for vehicles and machinery. These measures will reduce effects on surface waters;
- Retained areas of pasture within Zone E (Woodbank) will be diversified through the application of an appropriate native meadow seed mix and managed as a traditional meadow. This will improve both the structure and composition of this habitat, in particular for pollinators. These measures will be incorporated into the Landscape and Biodiversity Management Plan for the Proposed Development;
- Impacts on scrub, woodland and other tree-ed habitats, in particular within Zones B, D and E, and Area 11, will be mitigated through the provision of compensatory tree planting. Tree species to be used will be native, and typical of those which would occur naturally in these types of habitat, as described in the Design and Access Statement that accompanies this EIAR. Areas of semi-natural woodland lacking in regenerating trees and/or an appropriate ground flora will be strengthened through the underplanting of new trees, and the introduction of an appropriate ground flora (see reference above to reuse of existing Ancient Woodland soils and ground flora); and,
- Areas in Zone B (Riverside) supporting hybrid/non-native bluebells will be stripped and the soils disposed of off-site; this material will not be reused within the Proposed Development in order to prevent further spread of INNS.

Otter

5.6.30 Construction phase impacts on otter will be reduced through:

- All watercourses within 250 m of the Proposed Development footprint will be surveyed for signs of otters. If necessary, licences will be sought for any relevant resting places; and,

- The site induction for construction personnel will include a site briefing provided by the ECoW regarding otter and the identification of shelters of this species. The briefing will also emphasise the importance of protection of watercourses.

Badger

5.6.31 Construction phase impacts on badger will be reduced through:

- Pre-construction surveys will be carried out for badger for all relevant habitat within 100 m of construction. If necessary, licences will be sought for any relevant setts discovered as a result of this; and,
- The site induction for construction personnel will include a site briefing provided by the ECoW regarding badger, and the identification of shelters of this species. The briefing will also emphasise the importance of protection of key habitats such as woodland.

Red Squirrel

5.6.32 Construction phase impacts on red squirrel will be reduced through:

- Minimisation of tree loss within Zones D (Staff Area) and E (Woodbank) at the detailed design stage;
- Pre-construction surveys will be carried out for red squirrel for all relevant habitat within 50 m of construction, including tree-downtakings and vegetation clearance. If necessary, licences will be sought for any dreys discovered as a result of this; and,
- The site induction for construction personnel will include a site briefing provided by the ECoW regarding red squirrel, and the identification of shelters of this species. The briefing will also emphasise the importance of protection of key habitats such as woodland.

Bats

5.6.33 Construction phase impacts on bats will be reduced through:

- Construction of a bespoke Bat House within the ground of Woodbank House (Zone E) to replace roosting opportunities which will be lost as a result of the restoration and conversion of the building. The Bat House will be situated no further than 100 m from the existing locations within Woodbank House, and will incorporate underground potential hibernation features, and a roof void suitable for use by brown long-eared bats, as well as crevices for roosting pipistrelle species. The Bat House will be in a quiet location, and will not be directly lit. A full EPS licence application will then be made to NatureScot to legitimise the works on Woodbank House;
- At the detailed design stage, minimisation of the number of trees with bat roost suitability that will be directly affected through removal, and/or disturbed through noise, vibration or construction phase lighting. For those trees which cannot be designed out of the Proposed Development, aerial survey will be needed to confirm their roosting status. Licence applications will be needed to NatureScot for any tree works which are found to affect tree bat roosts, including both direct and indirect effects, and these will be supported by Species Protection Plans detailing all relevant additional mitigation and compensation measures, for example the strapping of potential roost features directly affected onto retained mature trees; and,
- A tree-mounted bat box will be provided for each tree within the Site with bat roost suitability which will be affected by the Development, either directly through removal or indirectly through disturbance. The type and location of these boxes will be agreed with a suitably qualified ecologist, at the detailed design stage.

Breeding Birds

5.6.34 Tree-felling and or vegetation removal will not be undertaken during the bird nesting season. If this is not possible, the relevant areas will need to be inspected by a suitably qualified ecologist in advance of the works, to ensure that no breeding birds are present. If nesting is noted or suspected, works will need to cease until it has been ascertained that all fledglings have hatched and have left the nest(s).

5.6.35 A range of bird nest boxes will be installed as part of the Proposed Development. Where possible these will be integrated boxes within new buildings, for house sparrow, but 50 tree-

mounted bird boxes should also be provided throughout the Site, at locations to be agreed with a suitably qualified ecologist.

Operational Phase Effects

5.6.36 During the operational phase of the Proposed Development, impacts on IEFs will arise through the introduction of disturbance sources, including the increased presence of people and dogs in semi-natural habitats, increased traffic movements, noise, vibration and night-time lighting levels.

Designated Sites and Habitats

5.6.37 Direct operational impacts on Ancient Woodland, both within the Site and adjacent to it, and off-site designated sites such as the Boturich Woodlands SSSI, could arise through increased recreational use of these areas. This could include trampling, biking, dog fouling, littering and other forms of anti-social behaviour. Such activities would increase the degradation of the ground flora of these designated sites and/or habitats, leading to compaction and/or erosion of vegetation and soils, and a decrease in both habitat quality and extent. There may also be impacts on Ancient Woodland arising from ongoing management of trees for safety reasons. Operational phase impacts on the Boturich Woodlands SSSI are considered unlikely to occur given the separation distance between it at the Site, and the relative inaccessibility of the SSSI. However, impacts such as these are already evident in some parts of Drumkinnon Wood, and therefore considered to be more likely, resulting in adverse impacts significant at the Local level for Ancient Woodland.

5.6.38 The Endrick Water SAC (and by association the River Leven LNCS) would both be susceptible to disturbance impacts arising from elevated night lighting levels which could affect the migration of salmonids up the river. However, no additional lighting is proposed for Riverside, and therefore no operational phase effects are anticipated for these sites.

Otter

5.6.39 Operational phase impacts on otter are unlikely given that they are not resident on the Site. However, animals that occasionally frequent the peripheries of the Site may experience higher levels of disturbance as a result of increased visitor numbers and may also be at risk from collision with traffic. These impacts would be significant at the Site level, prior to mitigation.

Badger

5.6.40 As with otter, operational phase impacts on badger are unlikely, but those animals that have habitually foraged on the Site will be at greater risk from disturbance by people and/or dogs, and from collision with traffic. These impacts would be significant at the Site level, prior to mitigation.

Red Squirrel

5.6.41 Operational phase impacts on red squirrel are also unlikely, but they too may be discouraged from frequenting the Site due to disturbance sources, and/or could be at risk from traffic collisions. These impacts would be significant at the Site level, prior to mitigation.

Bats

5.6.42 The Site has been shown to be particularly well-used by foraging and commuting bats, with roost locations confirmed in Zone E (Woodbank) and likely to be present within trees in Zones D (Boathouse and Staff Area) and B (Riverside). Although parts of the Site, and in particular locations immediately adjacent to it, are currently night lit, any introduction of new lighting into currently dark zones, particularly those comprising wooded habitats, may alter patterns of bat foraging activity, and may therefore also alter the breeding success of bats which habitually have used the Site in the past. Although pipistrelle bats in particular are known to hawk off street lighting, this is considered likely to be a high magnitude impact, resulting in a significant adverse effect at the Local level.

Breeding Birds

5.6.43 The operation of accommodation within habitats traditionally used by nesting birds will introduce new disturbance sources from lighting, noise, people and dogs. Prior to mitigation, this will result in an adverse effect significant at the Site level.

Table 5-13: Likely Operational Phase Impacts and Effects on Designated Sites Prior to Mitigation

IEF	Importance Level	Impacts	Effects	Impact Scale and Certainty	Effect Significance Prior to Mitigation
Endrick Water SAC	International	Night-time lighting disturbance.	Reduced survival or breeding success of species associated with the SAC.	No new lighting of watercourse is proposed.	No significant effect.
Boturich Woodlands SSSI	National	Increased recreational pressures on woodland SSSI.	Decrease in quality and extent of habitat.	Low adverse, unlikely, ongoing.	No significant effect.
River Leven Corridor LNCS	Council	Night-time lighting disturbance.	Reduced survival or breeding success of species associated with the LNCS.	No new lighting of watercourse is proposed.	No significant effect.
Ancient Woodland	Council	Increased recreational pressures on retained areas of Ancient Woodland, including off-site locations.	Decrease in quality and extent of habitat.	Medium adverse impact; likely, permanent.	Adverse significant effect at the **Local** level.

Table 5-14: Likely Operational Phase Impacts and Effects on Habitats Prior to Mitigation

IEF	Importance Level	Impacts	Effects	Impact Scale and Certainty	Effect Significance Prior to Mitigation
Surface standing waters	Local	Increased visitor numbers to shoreline	Decrease in habitat quality and integrity.	Low adverse impact; likely, ongoing.	Adverse significant effect at the **Site** level.
Abandoned pasture	Local	No impacts anticipated.	n/a	n/a	No significant effect.
Mixed scrub	Local	Disturbance and further fragmentation.	Decrease in habitat quality and integrity.	Low adverse impact; likely, ongoing.	Adverse significant effect at the **Site** level.
Mixed broad-leaved woodland	Council	Increased recreational pressures.	Decrease in habitat quality and integrity.	Medium, adverse impact; likely, ongoing.	Adverse significant effect at the **Local** level.
Trees	Local	No impacts anticipated.	n/a	n/a	No significant effect.

Table 5-15: Likely Operational Phase Impacts and Effects on Habitats Prior to Mitigation

IEF	Importance Level	Impacts	Effects	Impact Scale and Certainty	Effect Significance Prior to Mitigation
Otter	Site	Increased disturbance from people and dogs. RTA casualties.	Reduced foraging areas and breeding success.	Low adverse, unlikely, ongoing.	Adverse significant effect at the **Site** level.
Badger	Site	Increased disturbance from people and dogs. RTA casualties.	Reduced foraging areas and breeding success.	Low adverse, unlikely, ongoing.	Adverse significant effect at the **Site** level.
Red squirrel	Council	Increase noise and lighting disturbance. RTA casualties.	Reduced foraging areas and breeding success.	Low adverse, unlikely, ongoing.	Adverse significant effect at the **Site** level.
Bats	Local	Lighting and noise.	Disturbance to commuting and foraging routes. Impaired breeding success.	High adverse, likely, ongoing.	Adverse significant effect at the **Local** level.
Breeding birds	Local	Increased disturbance from people, lighting and dogs.	Injury or death; reduced breeding success.	Medium adverse, likely, ongoing.	Adverse significant effect at the **Site** level.

Operational Phase Mitigation Measures

5.6.44 Operational effects on IEFs will be mitigated through:

- Design and installation of a wildlife-friendly night lighting scheme, in particular for bats. This should focus on restricting the use of lighting to only those areas where it is strictly needed, using timers and low-level pillar lighting wherever possible to ensure dark corridors are maintained for use by nocturnal and crepuscular animals. Lighting wavelengths should be kept within the frequencies advised by the Bat Conservation Trust for use in areas with high bat activity;
- Implementation of a 10mph speed limit on all new access roads throughout the Site;
- Dogs to be kept on leads throughout the Site;
- No pedal cycles to be used within woodland and grassland habitat areas; and,
- Clear signage of permitted pedestrian footpaths, with appropriately located environmental interpretation boards.

5.7 Habitats Regulations Assessment

The Endrick Water SAC

5.7.1 The conservation objectives of the Endrick Water SAC are listed as:

(i) to avoid deterioration of the habitats of the qualifying species or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained and the site makes an appropriate contribution to achieving favourable conservation status for each of the qualifying features; and,

(ii) to ensure for the qualifying species that the following are maintained in the long term:

- Population of the species, including range of genetic types for salmon, as a viable component of the site;
- Distribution of the species within site;
- Distribution and extent of habitats supporting the species;

- Structure, function and supporting processes of habitats supporting the species; and,
- No significant disturbance of the species.

Pressures on the SAC

5.7.2 NatureScot lists a number of pressures on the qualifying features of the Endrick Water SAC. Of most relevance to the Proposed Development is the potential for a reduction in water quality in the River Leven, and the potential for disturbance through noise, vibration and artificial lighting, particularly in the hours of darkness.

The Need for HRA

5.7.3 The nearest infrastructure component of the Development is situated c. 9 km from the Endrick Water SAC. However, the Development is also < 5 m from a habitat feature (the River Leven) on which qualifying features of the SAC are dependent. There is therefore the potential for the Development to affect the qualifying interest features of this site, namely Atlantic salmon and lamprey species, during their migratory phases.

5.7.4 Due to the connection with the SAC and nature of the Development, the proposals fall under the provisions of Article 6(3) of the EU Habitats Directive, and hence Regulation 48 of the Habitat Regulations 1994 (as amended).

5.7.5 Under Regulation 48, an "appropriate assessment" needs to be undertaken in cases where any plan or project which:

a) either alone or in combination with other plans or projects would be likely to have a significant impact on a European site designated for nature conservation, and,

b) is not directly connected with the management of the site for nature conservation.

5.7.6 The term Habitats Regulations Assessment (HRA) is usually adopted to describe this appropriate assessment process.

5.7.7 In terms of the requirements listed above for HRA, it is clear that the Development is not directly connected with the management of the SAC for nature conservation (criterion b). Therefore, it must be demonstrated that the Development, either alone or in combination with other plans or projects, does not have a significant impact on the SAC. Guidance provided by SERAD (2000) and SNH (2012, updated in 2015) is clear that the HRA process is also relevant to projects or plans outwith a Natura 2000 site boundary; it is the potential impacts on a site's qualifying interests which are relevant, and not necessarily the project or plan's location in respect to the Natura 2000 site boundary.

5.7.8 Under the terms of the Regulations, the HRA is to be carried out by the relevant competent authority. With respect to the Proposed Development, the competent authority is the Loch Lomond and the Trossachs National Park Authority (LLTNPA), and this section of the report seeks to provide the information required by LLTNPA to undertake a HRA of the Development on the SAC. It is based on a review of proposed construction and operational effects of the Development, and the known ecological characteristics of the relevant qualifying features.

Potential Impacts on the SAC's Conservation Objectives

Maintaining Populations of Qualifying Species as a Viable Component of the Site

5.7.9 The River Leven is the migratory link for Atlantic salmon and lamprey species, which travel from the Atlantic up to the Endrick Water SAC. The protection and management measures described in the Proposed Development's Construction Method Statements (CMSs) will ensure that there will be no direct lighting of the river during either the construction phase or the operational phase of the Development which would impact on this migratory movement of fisheries, particularly during the night. In addition, strict water quality protection measures will be in place during construction to prevent pollution (including siltation) of the river which could decrease its attractiveness to migratory fish. This will prevent the creation of barrier to fish movement and therefore, the populations of the SAC qualifying species will be maintained as viable components of the SAC.

Maintaining Distribution of Qualifying Species Within the Site

5.7.10 The Site does not include any habitats on which the qualifying species are directly dependent. Therefore, it is highly unlikely that there would be any impacts as a result of the Proposed Development which would directly affect the distribution of the qualifying species within the SAC. There is a higher probability however that there could be indirect effects arising from the Proposed Development which would alter the ability of species to reach the SAC, and these are covered below.

Maintaining Distribution and Extent of Habitats Supporting These Species

5.7.11 There will be no direct impacts on habitats within the SAC during the construction and operation of the Development. Indirect impacts on supporting habitats, through lighting and/or deterioration in river water quality, will be addressed through measures integrated into the Proposed Developments' design, and contained in the Proposed Development's Construction Method Statements. Assuming that these are implemented in full, there will be no significant impacts on the distribution or extent of the habitats which support the SAC qualifying species.

Maintaining the Structure, Function and Supporting Processes of Habitats Supporting These Species

5.7.12 As described above, there will be no direct impacts on habitats within the SAC as a result of the Development, and hence there will be no effects on the functioning of habitats regularly used by the qualifying species. As also described above, indirect impacts on supporting habitats, through lighting and/or deterioration in river water quality, will be addressed through measures contained in the Development's design or Construction Method Statements. Assuming that these are implemented in full, there will therefore be no significant impacts on the structure, function or supporting processes of the habitats which support the SAC qualifying species.

No Significant Disturbance of These Species

5.7.13 Migratory Atlantic salmon are most likely to be using the River Leven during the hours of darkness. The migratory requirements of lamprey are less specific. Lighting schemes for the Proposed Development will not introduce any new light-spill onto the river corridor over and above that already present, and during its construction lighting will also be well-directed and limited to just those areas of need. In doing so, it is not anticipated that there will be any significant disturbance to the SAC qualifying species.

Conclusion of the HRA

5.7.14 Information has been presented here relating to the material required to support a Habitats Regulations Assessments for the Endrick Water SAC, in relation to the Proposed Development.

5.7.15 Protection measures for the River Leven, relating to water quality and night-time lighting, will be integrated into design and method statements, and collectively these will ensure that there will be no significant negative effects on the SAC.

5.8 Residual Effects and Statement of Significance

5.8.1 A summary of the residual significance following successful implementation of mitigation and enhancement is provided in **Table 5.16** below. Assuming full compliance with the embedded mitigation described here, and implementation of additional construction phase mitigation and operational phase enhancement, significant residual ecological effects associated with the Proposed Development will be limited to impacts on Ancient Woodland and mixed broad-leaved woodland. This is because compensatory planting is unlikely to provide compensation for the loss of ancient woodland, due to the definition of this habitat type being dependent on continuity of woodland cover, and that the planting of trees will take decades if not centuries to replicate the habitats lost to the Proposed Development. This will be ameliorated in part through translocation of the biotic and abiotic environment currently within the woodland floor wherever INNS have **not** historically been present, and the clearance of INNS from the woodland areas, but there will be a residual adverse impact significant at the Site level for Ancient Woodland. Similarly, for mix broad-leaved woodland, the introduction of built features throughout this habitat will inevitably alter its functioning and extent, but the compensation and enhancement measures will reduce residual construction phase impacts to being significant at only the Site level.

5.8.2 The shadow Habitats Regulations Assessment presented here also concluded, assuming full compliance with the mitigation described here, that there will be no significant effects on the Endrick Water SAC.

Table 5-16: Residual Effects

Ecological Feature	Maximum Significance of Effect Prior to Mitigation	Avoidance	Mitigation	Compensation	Enhancement	Residual Significance of Effect
Construction Phase						
Endrick Water SAC	Adverse effect significant at a Local level.	Work areas will be tightly contained to avoid unnecessary encroachment into ecologically sensitive areas. A stand-off of at least 6 m from the edges of watercourse and waterbodies will be maintained wherever possible.	Good practice measures when working in or near to watercourses will be adhered to. On-site work will be supervised by an ECoW who will aim for ecological effects to be minimised wherever possible.	n/a	n/a	No significant effect.
Boturich Woodlands SSSI	None	n/a	n/a	n/a	n/a	No significant effect.
River Leven Corridor LNCS	Adverse effect significant at a Site level.	Work areas will be tightly contained to avoid unnecessary encroachment into ecologically sensitive areas. A stand-off of at least 6 m from the edges of watercourse and waterbodies will be maintained wherever possible.	Good practice measures when working in or near to watercourses will be adhered to. On-site work will be supervised by an ECoW who will aim for ecological effects to be minimised wherever possible.	n/a	n/a	No significant effect.
Ancient Woodland	Adverse effect significant at a Council level.	Due to mapping discrepancies in the AWI, the true area of ancient woodland affect is less than as mapped, and the Development has sought to avoid this wherever possible, removing Drumkinnon Wood from the proposals. Work areas will be tightly contained to avoid unnecessary encroachment into ecologically sensitive areas, including fencing-off of sensitive woodland areas.	Reuse of disturbed top soils where these have not historically supported INNS. On-site work will be supervised by an ECoW who will aim for ecological effects to be minimised wherever possible.	Compensatory planting required for 0.48 ha but acknowledged that this will not technically compensate for the loss of ancient woodland habitat.	Clearance of INNS via Ancient Woodland Restoration Plan.	**Adverse effect significant at the Site level.**
Surface standing waters	Adverse effect significant at a Site level.	Work areas will be tightly contained to avoid unnecessary encroachment into ecologically sensitive areas. A stand-off of at least 6 m from the edges of watercourse and waterbodies	Good practice measures when working in or near to watercourses will be adhered to. On-site work will be supervised by an ECoW who will aim for ecological effects to be minimised wherever possible.	n/a	n/a	No significant effect.

Ecological Feature	Maximum Significance of Effect Prior to Mitigation	Avoidance	Mitigation	Compensation	Enhancement	Residual Significance of Effect
		will be maintained wherever possible during detailed design and/or micro-siting.				
Abandoned pasture	Adverse effect significant at a Site level.	Work areas will be tightly contained to avoid unnecessary encroachment into ecologically sensitive areas.	On-site work will be supervised by an ECoW who will aim for ecological effects to be minimised wherever possible.	Landscaping proposals will maximise the opportunities for the use of native seed mixes for wildflower banks wherever practicable.	Retained pasture will be through seeded with a native wildflower mix and managed as a traditional hay meadow.	No significant effect.
Mixed scrub	Adverse effect significant at a Site level.	Work areas will be tightly contained to avoid unnecessary encroachment into ecologically sensitive areas.	On-site work will be supervised by an ECoW who will aim for ecological effects to be minimised wherever possible.	n/a	Clearance of INNS via Ancient Woodland Restoration Plan. Underplanting and landscape planting of native tree and shrub species.	No significant effect.
Mixed broad-leaved woodland	Adverse effect significant at a Council level.	Work areas will be tightly contained to avoid unnecessary encroachment into ecologically sensitive areas, including fencing-off of sensitive woodland areas. Compensatory planting areas to be revisited during detailed design to avoid areas already considered to be broad-leaved woodland.	Reuse of disturbed top soils where these have not historically supported INNS. On-site work will be supervised by an ECoW who will aim for ecological effects to be minimised wherever possible.	Compensatory planting required for 1.33 ha.	Clearance of INNS via Ancient Woodland Restoration Plan. Underplanting and landscape planting of native tree species.	**Adverse effect significant at a Site level.**
Tree lines	None	n/a	n/a	n/a	n/a	No significant effect.
Otter	Adverse effect significant at a Site level.	Work areas will be tightly contained to avoid non-essential encroachment into ecologically sensitive areas. No works at the river edge two hours before and after dawn/dusk.	Preconstruction survey. Toolbox talk for all operatives regarding otter. Site speed limit of 10 mph. Good practice measures when working in or near to watercourses will be adhered to. Trenches and excavations will be covered at the end of each working day, or will include ramps, and stored pipes will be capped, to prevent entrapment of animals. If construction work is carried out during the hours of darkness,	n/a	n/a	No significant effect.

Ecological Feature	Maximum Significance of Effect Prior to Mitigation	Avoidance	Mitigation	Compensation	Enhancement	Residual Significance of Effect
			machinery and floodlights will be directed away from watercourses. Use of heavy machinery and pile drivers will be limited to avoid two hours before and after dawn and dusk within 30 m of watercourses or waterbodies. On-site work will be supervised by an ECoW who will aim for ecological effects to be minimised wherever possible.			
Badger	Adverse effect significant at a Site level.	Work areas will be tightly contained to avoid non-essential encroachment into ecologically sensitive areas.	Preconstruction survey. Toolbox talk for all operatives regarding badger. Site speed limit of 10 mph. Trenches and excavations will be covered at the end of each working day, or will include ramps, and stored pipes will be capped, to prevent entrapment of animals. If construction work is carried out during the hours of darkness, machinery and floodlights will be directed away from woodland edges. Use of heavy machinery and pile drivers will be limited to avoid two hours before and after dawn and dusk within 30 m of woodland areas. On-site work will be supervised by an ECoW who will aim for ecological effects to be minimised wherever possible.	n/a	n/a	No significant effect.
Red squirrel	Adverse effect significant at a Local level.	Potential drey trees will be avoided wherever practicable during detailed design. Work areas will be tightly contained to avoid non-essential encroachment into ecologically sensitive areas.	Preconstruction drey survey and licensing where required. Toolbox talk for all operatives regarding red squirrel. Site speed limit of 10 mph. Trenches and excavations will be covered at the end of each working day, or will include ramps, and stored pipes will be capped, to prevent entrapment of animals. If construction work is carried out during the hours of darkness, machinery and floodlights will be	n/a	Underplanting and landscape planting of tree species known to be preferential forage and/or drey trees for red squirrel.	No significant effect.

Ecological Feature	Maximum Significance of Effect Prior to Mitigation	Avoidance	Mitigation	Compensation	Enhancement	Residual Significance of Effect
			directed away from woodland edges. Use of heavy machinery and pile drivers will be limited to avoid two hours before and after dawn and dusk within 30 m of woodland areas. On-site work will be supervised by an ECoW who will aim for ecological effects to be minimised wherever possible.			
Bats	Adverse effect significant at a Local level.	Impacts on trees with bat roosting suitability will be avoided wherever practicable during detailed design.	Update tree PRA and aerial inspections as required. Licensing as appropriate.	Provision of bespoke Bat House. Provision of tree bat boxes for every tree with BRS that is removed.	Soft landscaping schemes which utilise native species of local provenance to increase bat foraging habitat.	No significant effect.
Breeding birds	Adverse effect significant at a Site level.	Works with the potential to disturb nesting birds will be avoided during the nesting bird season. All potential nesting bird habitat will be pre-checked by the ECoW in advance of any construction activities.	On-site work will be supervised by an ECoW who will aim for ecological effects to be minimised wherever possible.	Provision of integrated bird nest boxes in new/ renovated buildings. Provision of 50 tree bird boxes.	Soft landscaping schemes which utilise native species of local provenance to increase nesting bird habitat.	No significant effect.
Operational Phase						
Endrick Water SAC	No significant effect.	n/a	n/a	n/a	n/a	No significant effect.
Boturich Woodlands SSSI	No significant effect.	n/a	n/a	n/a	n/a	No significant effect.
River Leven Corridor LNCS	No significant effect.	n/a	n/a	n/a	n/a	No significant effect.
Ancient Woodland	Adverse effect significant at a Local level.	n/a	Use of bikes prohibited within ancient woodland areas. Dogs to be kept on leads within ancient woodland areas. Clear signage of pedestrian routes through ancient woodland areas. Provision of information/ environmental education boards regarding ancient woodland resource.	n/a	n/a	**Adverse effect significant at a Site level.**
Surface standing waters	Adverse effect significant at a Site level.	n/a	Use of bikes prohibited along shoreline habitats.	n/a	n/a	No significant effect.

Ecological Feature	Maximum Significance of Effect Prior to Mitigation	Avoidance	Mitigation	Compensation	Enhancement	Residual Significance of Effect
			Dogs to be kept on leads along shoreline. Provision of information/ environmental education boards regarding shoreline resource.			
Abandoned pasture	No significant effect.	n/a	n/a	n/a	n/a	No significant effect.
Mixed scrub	Adverse effect significant at a Site level.	n/a	Use of bikes prohibited within woodland areas. Dogs to be kept on leads within woodland areas. Clear signage of pedestrian routes through woodland areas. Provision of information/ environmental education boards regarding woodland and scrub resource.	n/a	n/a	No significant effect.
Mixed broad-leaved woodland	Adverse effect significant at a Local level.	n/a	Use of bikes prohibited within woodland areas. Dogs to be kept on leads within woodland areas. Clear signage of pedestrian routes through woodland areas. Provision of information/ environmental education boards regarding woodland resource.	n/a	n/a	No significant effect.
Tree lines	No significant effect.	n/a	n/a	n/a	n/a	No significant effect.
Otter	Adverse effect significant at a Site level.	n/a	Use of bikes prohibited along shoreline habitats. Dogs to be kept on leads along shoreline. Provision of information/ environmental education boards regarding shoreline resource. Site speed limit of 10 mph.	n/a	n/a	No significant effect.
Badger	Adverse effect significant at a Site level.	n/a	Dogs to be kept on leads within woodland areas. Clear signage of pedestrian routes through woodland areas. Provision of information/ environmental education boards regarding woodland resource. Site speed limit of 10 mph. Wildlife-friendly lighting scheme.	n/a	n/a	No significant effect.
Red squirrel	Adverse effect significant at a Site level.	n/a	Dogs to be kept on leads within woodland areas.	n/a	n/a	No significant effect.

Ecological Feature	Maximum Significance of Effect Prior to Mitigation	Avoidance	Mitigation	Compensation	Enhancement	Residual Significance of Effect
			Clear signage of pedestrian routes through woodland areas. Provision of information/ environmental education boards regarding woodland resource. Site speed limit of 10 mph. Wildlife-friendly lighting scheme.			
Bats	Adverse effect significant at a Local level.	n/a	Bat-friendly lighting scheme throughout the Site, as part of detailed design.	n/a	n/a	No significant effect.
Breeding birds	Adverse effect significant at a Site level.	n/a	Dogs to be kept on leads within woodland areas. Clear signage of pedestrian routes through woodland areas. Provision of information/ environmental education boards regarding woodland resource. Site speed limit of 10 mph. Wildlife-friendly lighting scheme.	n/a	n/a	No significant effect.

5.9 Monitoring

5.9.1 Post-construction monitoring is recommended for key IEFs present at the Site, during the first 5 years of operation. This should entail:

- Full red squirrel monitoring in Years 1, 3 and 5 of operation, with additional management recommendations stemming from those monitoring results, as appropriate; and,
- NVC survey of woodlands within the Site in Years 1 and 5 of operation, to determine the extent of habitat change and the success of restoration measures employed.

5.9.2 Additional monitoring may be required as a condition of any protected species licences, and or in detailed Habitat and Landscape Management Plans produced for detailed design.

5.10 Cumulative Effects

5.11.1 Following scoping, no cumulative assessment was required for ecology.

5.11 Summary

5.11.1 Throughout 2021, a desk study and a range of ecological field surveys were undertaken for the Site and appropriate buffers of this to inform an Ecological Impact Assessment of the Proposed Development. The findings of these studies informed the layout and proposals comprising the Proposed Development, and following the application of a range of avoidance, mitigation, enhancement and compensation measures there will be residual impacts on Ancient Woodland and mixed broad-leaved woodland as a result of the construction phase, and residual impacts on Ancient Woodland as a result of the operational phase. All of these residual impacts will be significant at the Site level.

5.11.2 Further ecological survey will be needed at the detailed design stage for the Proposed Development, and measures needed under the mitigation hierarchy will be relevant for habitats, invasive non-native species, otter, badger, red squirrel, bats and nesting birds.

5.11.3 A shadow Habitats Regulations Assessment has also been presented here, which, following the application of appropriate avoidance and mitigation measures, has concluded that there will be no significant effects on Natura 2000 sites as a result of the Proposed Development.

5.12 References

- Chartered Institute of Ecology and Environmental Management (2018). Guidelines for Ecological Impact Assessment in the United Kingdom and Ireland: Terrestrial, Freshwater, Coastal and Marine. 3rd Edition.
- SEPA (2013). Pollution Prevention Guidelines.
- European Commission (2000). Managing Natura 2000 Sites: The provisions of Article 6 of the Habitats Directive 92/43/EEC. Office for Official Publications of the European Communities, Luxembourg.
- SERAD (2000) Habitats and Bird Directives: implementation in Scotland of EC Directives on the Conservation of Natural Habitats and of Wild Flora and Fauna, and the Conservation of Wild Birds ("The Habitats and Bird Directives"). Revised Guidance updating Scottish Office Circular No. 6/1995.
- SNH (2015). Habitat Regulations Assessment of Plans: Guidance for Plan-Making Bodies in Scotland. Version 3.0. Updated version of 2012 guidance initially prepared by David Tyldesley and Associates.

6 Trees & Woodland

6.1 Introduction

6.1.1 This chapter of the EIAR provides an assessment of the likely significant effects from the proposed development on trees and woodland. The assessment is based on the characteristics of the site and surrounding area and the key parameters of the proposed development detailed in **Chapter 2 – Site and the Proposed Development**.

6.1.2 This chapter has been prepared by Julian A Morris Professional Tree Services, in line with best practice; a statement outlining the relevant expertise and qualifications of competent experts appointed to prepare this EIAR is provided in **Appendix 1.1.**

6.1.3 The aims of this chapter are to identify the potential impacts on existing trees, groups of trees and woodland on the Site that would arise from the Proposed Development and to address the issues raised in the LLTNPA EIA Scoping Opinion. Mitigation measures are proposed and are presented in this chapter, together with a brief for compensatory planting or Woodland Management Plans for relevant parts of the Site.

6.1.4 This chapter is supported by the following figures and technical reports provided in **Appendices 6.1 to 6.6**:

- **Appendix 6.1 – Tree Cover plans**;
- **Appendix 6.2 – Tree Preservation Order**;
- **Appendix 6.3 – Review of Ancient Woodland Inventory (AWI)**;
- **Appendix 6.4 – Woodbank Tree Report and Assessment Matrix**;
- **Appendix 6.5 Summary of Impact Assessment**; and,
- **Appendix 6.6 Compensatory Planting**.

6.2 Policy Context, Legislation, Guidance and Standards

Legislation

6.2.1 The overarching legislative framework applicable to this EIA for the proposed development is outlined in **Chapter 4 – Legislative and Planning Policy Context**. In addition, legislation specifically relating to trees and woodlands subject to Tree Preservation Orders or requiring felling permissions comprise:

- Town & Country Planning Scotland Act 1997 Part VII **Chapter 1** as amended by the Planning Etc Scotland Act 2006;
- The Town and Country Planning (Tree Preservation Order and Trees in Conservation Areas) (Scotland) Regulations 2010;
- Forestry and Land Management (Scotland) Act 2018; and,
- The Forestry (Exemptions) (Scotland) Regulations 2019.

6.2.2 With potential woodland removal associated with the proposed development, any woodland removal assessed in this chapter does not come within the scope of the Environmental Impact Assessment (Forestry) (Scotland) Regulations 1999 as it would not comprise a 'forestry operation' as defined in Regulation 2.

Policy

6.2.3 The planning policy framework applicable to this EIA for the proposed development is outlined in **Chapter 4 – Legislative and Planning Policy Context**. In addition, Policy specifically relating to trees and woodlands subject to Tree preservation Orders or requiring felling permissions comprise:

- Planning Circular 1 2011 February 2011 'Tree Preservation Orders'; and,
- The Scottish Government's Policy on Control of Woodland Removal 2009.

Guidance and Relevant Technical Standards

6.2.4 The following guidance and technical standards have informed this assessment:

- BS 5837:2012 “Trees in relation to design, demolition and construction – Recommendations”;
- BS EN 17037:2018 “Daylight in buildings”;
- Site Layout Planning for Daylight and Sunlight (2nd edition) - Building Research Establishment 2011;
- Arboricultural Association Guidance Note 12 - The use of cellular confinement systems near trees: A guide to good practice 2020;
- Field Surveys for Ancient Woodlands: Issues and Approaches - Hallam Environmental Consultants Ltd., Biodiversity and Landscape History Research Institute and Geography, Tourism and Environment Change Research Unit, Sheffield Hallam University October 2009;
- The identification of ancient woodland: demonstrating antiquity and continuity- issues and approaches - Hallam Environmental Consultants Ltd., Biodiversity and Landscape History Research Institute and Geography, Tourism and Environment Change Research Unit, Sheffield Hallam University October 2009;
- Scottish Government’s policy on control of woodland removal: implementation guidance - February 2019;
- A guide to understanding the Scottish Ancient Woodland Inventory (AWI) - Scottish Natural Heritage (undated);
- Restoration of Native Woodland on Ancient Woodland Sites - Forestry Commission, Edinburgh 2003;
- Scottish Forestry - Scoping Opinion - February 2019;
- Planning for Ancient Woodland - Planner’s Manual for Ancient ’Woodland and Veteran Trees October 2017 (Scottish edition) – Woodland Trust;
- Ancient And other veteran trees: further guidance on management (2017) Ancient Tree Forum;
- Ancient woodland indicator plants in Scotland (2009) - Carol L Crawford, Principal Ecologist and Chartered Forester, The Natural Resource Consultancy;
- Strachan, I.M. 2017. Manual of terrestrial EUNIS habitats in Scotland. Version 2. Scottish Natural Heritage Commissioned Report No. 766 and accompanying correspondence tables; and,
- Quantified Tree Risk Assessment User Manual v 5.2 2016.

6.3 Methodology

6.3.1 The environmental impact assessment must identify, describe, and assess in an appropriate manner, in light of the circumstances relating to the proposed development, the direct and indirect significant effects of the proposed development on the following factors:

- Population and human health;
- Biodiversity, and in particular species and habitats protected;
- Land, soil, water, air and climate; and,
- Material assets, cultural heritage and the landscape.

6.3.2 The effect of changes to tree cover, whether by woodlands, groups or individual trees may extend beyond the scope of an Environmental Impact Assessment. A significant benefit provided by trees is amenity, which does not come directly within the EIA remit but falls within the remit of the Planning Authority. It is generally accepted that amenity trees contribute to a sense of wellbeing if appropriately positioned and managed. These might be considered intangibly relevant to an EIA. However, trees and woodlands almost invariably and inseparably

provide amenity and a range of other benefits. Some of these other benefits and the impact of their losses are assessed under other chapters, with considerable crossover to this one.

6.3.3 This chapter therefore primarily concentrates on the environmental impact on individual or groups of trees at a very local level, the overall cultural/heritage impact on ancient semi natural woodland and the loss of other forms of woodland that may give rise to the need for compensatory planting and/or justification in terms of public benefit under various policies. Appropriate cross-reference will be made to other chapters that deal directly or indirectly with the cumulative effects of trees and the wider habitat within woodlands.

6.3.4 The principal aspects considered within this assessment are:

- The extent of any woodlands affected by, or likely to be affected by, the Proposed Development;
- The extent of individual trees and groups of trees affected by, or likely to be affected by, the Proposed Development;
- The design constraints presented by the trees, groups of trees and woodlands and how the constraints should be addressed at the detailed design stage;
- The extent to which areas identified in the Ancient Woodland Inventory ("AWI") and lying within or immediately adjacent to proposed development comprise ancient or quasi-ancient woodland habitat;
- The extent to which proposed development will result in or could contribute to the loss or restoration of such habitats;
- Potentially damaging effect on trees and woodlands of the construction and use of the development;
- Design considerations to minimise or avoid these effects by appropriate engineering considerations;
- Physical and procedural protective measures required during construction to avoid damage to trees and their rooting environment;
- Identifying the need for any explicit proactive ancient woodland restoration proposals;
- The nature and extent of any required compensatory planting; and,
- Terms for a Woodland Management Plan that would give effect to ongoing protection of sensitive woodland habitat and ongoing restoration proposals.

6.3.5 The assessment presented in this trees and woodland chapter has been prepared in accordance with the EIA Regulations.

6.3.6 The assessment of likely effects makes comparison with the baseline season December 2021 to March 2022 during which time the site surveys were carried out.

Assessment Consultations

6.3.7 In undertaking the assessment presented in this chapter, the following activities have been carried out:

EIA Screening and Scoping

6.3.8 The following comments particularly relevant to this chapter were received as part of a recent EIA screening by LLTNPA:

- "The Loch Lomond and The Trossachs National Park Authority Tree Preservation Order No.10 (2018) does include a section of the area within the EIA assessment area. This principally relates to the area of lochshore in the north west of the site;
- "As well as the various policies highlighted in the Scoping Report, impacts of the proposal in terms of the Scottish Government Control of Woodland Removal policy should form part of the considerations in the EIA;
- "It is also worth noting that Scottish Planning Policy 2014 (para 218, page 49) states that "Woodland Removal should only be permitted where it would achieve significant and clearly defined additional public benefits". The criteria for determining the acceptability of woodland

removal and further information on the implementation of the policy is explained in the Control of Woodland Removal policy. This should be taken into account when preparing development proposals. If the principle of woodland loss can be appropriately satisfied, then compensatory planting proposals to ensure no net loss of woodland and delivery at least of the equivalent woodland-related net public benefits should be detailed;

- "The woodland included in the proposed development site is a mix of ancient woodland and native woodland which are recorded on the Ancient Woodland Inventory and Native Woodland Survey of Scotland. A European Nature Information System (EUNIS) survey with target notes (in particular, ancient woodland indicators which may require specific timing for surveys) should be included and this information along with mapped information should inform the assessment of woodland loss / development impacts;
- "The previous glade survey had not considered the impact on ground flora of any proposed development. Such impacts should form part of the EIA assessment;
- "The woodlands within the development boundary form a key habitat link across the southern end of Loch Lomond and the EIA should include assessment of the impact of the development of this habitat link;
- "Outline woodland management proposals should be provided as part of the EIA. Given the prevalence to Ash dieback there should be consideration of maintaining sycamore as a component of the woodland as a suit of species to replace ash; and,
- "Scottish Forestry should be included as a key consultee."

Post Scoping Consultation

6.3.9 No post scoping consultation has been or undertaken. Cognisance is given to Scottish Forestry's Scoping Opinion on control of woodland removal dated February 2019.

Study Area

6.3.10 The Site is described as comprising of two main areas known as West Riverside and Woodbank House and a small third area to the north comprising the site of a former boathouse and slipway. For the purpose of this chapter, the site is further subdivided into development Zones. For ease of reference these are the same as those used in the Parameters Plan included **as Appendix 2.1** in **Volume 2** and briefly described below.

Zone A: Station Square (Micro-Brewery, Restaurant, Monorail Station, Performance Area and Budget Accommodation)

6.3.11 Zone A lies immediately to the south of Zone B and comprises an area of gently mounded amenity grass and existing car-parking located between the River Leven, Balloch Road and Drumkinnon Wood. It is also the location of the 'Visit Scotland' information centre and Balloch Village ferry landing, which is used by Sweeney Cruises.

Zone B: Riverfront (Monorail, Proposed Lodges and Associated Car Parking Along the River Leven)

6.3.12 Zone B is bounded by Pier Road and then and the rear garden fence of housing along Clairinsh to the west and the River Leven to the east. Comprising relatively flat landform around 11m AOD, it includes the eastern part of Drumkinnon Wood, which contains mixed pioneer woodland species. A swathe of open grassland runs through the woodland.

Zone C: Pierhead (Main Loch-Shore Development Comprising the Hotel and Visitor Centre, Monorail Station)

6.3.13 Zone C comprises the area around the southern shore of Loch Lomond and to the east of the Loch Lomond Shores development (shops, restaurants and the 25m high Drumkinnon Tower housing the Sea Life centre). This zone also covers part of the area of land lying between Drumkinnon Bay and the River Leven, including a shingle beach, grassed picnic area and semi-mature woodland. The landform across much of the area is relatively flat and lies around 8m OD. The woodland is more undulating and rises to around 17m AOD.

Zone D: Boathouse and Staff Area (New Boathouse on the Loch Shore and Separate Service Building/ Area)

6.3.14 Zone D contains two distinct areas, (i) part of a small promontory on the south-western shore of the loch ('the Boathouse Area'), and (ii) an area of mainly woodland which wraps around the southern edge of the main Loch Lomond Shores car park and is bounded by Old Luss Road and Ben Lomond Way ('the Staff Area'). The underlying landform is undulating and has been disturbed through man-made activities including the installation of a major gas pipeline and reduction in ground levels associated with construction of Ben Lomond Way.

Zone E: Woodbank (Bothies/ Pods, Woodland Lodges and Countryside Lodges)

6.3.15 Zone E is bounded by Old Luss Road to the east, agricultural land to the north and east, and a footpath and housing at Lower Stoneymollan Road to the south. The Site comprises the derelict former Woodbank House Hotel and associated out-buildings and gardens, including a walled garden. The Site also includes an area of grazing land to the north and east and a large area of sloping woodland to the west and north west.

6.3.16 The spatial scope of and Study Area adopted in this chapter was determined by the Site extent and any trees or woodlands close enough to it to have crowns or important rooting within the Site, as specified in BS5837 2012.

Desk Top Study and Information Sources

6.3.17 A review of relevant information, guidance and planning policy relating to the proposed development was undertaken to characterise the landscape and visual baseline of the site and surrounding area including:

- Loch Lomond and the Trossachs National Park - Local Development Plan;
- National Library of Scotland archive of historic maps and aerial photographs (online);
- Nature Scot's Ancient Woodland Inventory; and,
- The Loch Lomond and The Trossachs National Park Authority Tree Preservation Order No.10 (2018).

6.3.18 In addition, at the time of year when the assessment was undertaken, it was not possible to document herbaceous plant coverage, and in particular those species that are widely accepted as Ancient Woodland Indicator Species, and so regard was had to Lomond Banks Ecology Technical Report by Applied Ecology Ltd dated March 2022 that included the results of a habitat assessment in the core botanical season 2021.

Fieldwork

6.3.19 A detailed survey of each tree or group of trees in the (see below for definition and rationale for groups) was undertaken in December 2021, resulting in a full inventory and Tree Constraints Plan for the Woodbank House area.

6.3.20 A walkover survey in March 2022 to record woodland types and species mix and the existence of any clearings or gaps and evidence or otherwise of antiquity, individual or populations of veteran or ancient trees, made or excavated ground, planting features or tree guards and trees, persistent tree/fungal associations.

Approach to Assessment

Hereinafter the Assessment is separated into two overlapping themes:

- Individual trees and groups of trees; and,
- Woodlands.

6.3.21 This separation is necessary to allow the impact on woodlands to be assessed and mitigated in substantially different ways than the impact on arboricultural trees or groups.

6.3.22 The first stage of the separation is to assess whether any tree within the Site is an individual, part of a group or part of an area of tree cover that comprises woodland. The second stage is to assess whether areas of tree cover that comprise woodland are within areas in the Ancient Woodland Inventory. The third stage is to assess the value of those woodlands in terms of

significant biodiversity legacy associated with remnant ancient woodland communities. Finally, if the value falls below a level where no relict ancient woodland features are present and by the passage of time cannot reasonably be expected to re-establish themselves, these woodlands are to be treated as ordinary woodlands.

6.3.23 To accord with BS 5837:2012 “Trees in relation to design, demolition and construction – Recommendations”; Clause 4.4.2.3 the term “group” is intended to identify trees that form cohesive arboricultural features either aerodynamically (e.g. trees that provide companion shelter), visually (e.g. avenues or screens) or culturally, including for biodiversity (e.g. parkland or wood pasture).

6.3.24 However, the term ‘woodland’ is used in preference to ‘group’ where the woodland or group is large enough to be considered woodland for the purpose of the Government’s Control of Woodland Removal Policy. Although this is not defined in law, areas over 0.1 Hectare with 20% or more canopy cover could in certain circumstances be deemed as woodland (see 6.2.8 below).

6.3.25 The Assessment makes the preliminary precautionary assumption that all trees and groups of trees within areas interpreted as possible Ancient Semi Natural Woodland in the Ancient Woodland Inventory are ancient semi natural woodland, unless found to be otherwise, either by being of very low or no relict ancient woodland habitat (in which case they are treated as ordinary ‘woodland’ for the purposes of assessment under the Control of Woodland Removal Policy) or by being so disaggregated that they can no longer be deemed ‘woodland’ (in which case they are treated as individual trees or groups).

6.3.26 An Ecological Assessment has been prepared and is included as **Chapter 5** of this EIA Report. This assessment included a combination of field study, such as a Phase 1 Habitat Survey and a desk-based assessment to identify the value of habitats within the Site, including woodland habitats.

6.3.27 A *Landscape and Visual Impact Assessment* has been prepared and is included as **Chapter 11** of this EIA Report. This assessment identifies the role that the trees, groups of trees and woodlands play in influencing the landscape character of the wider area. It also identifies areas of woodland that will play an important role in mitigating visual impacts of the proposed development on surrounding landscape and visual receptors.

Basis of Assessment of Woodlands - Extent of “Woodlands”

6.3.28 The widely held definition in the UK Forestry Standard and the National Inventory of Woodlands and Trees combined is that woodland is “The part of woods and forests where the ecological condition is, or will be, strongly influenced by the tree canopy. This embraces land under stands of trees with a canopy cover of at least 20%, or having the potential to achieve this, including integral open space, and including felled areas that are awaiting restocking. The minimum area is 0.1 ha.”

6.3.29 Impact will be assessed as a product of sensitivity of receptors and the magnitude of change to give an overall significance of effects. The following matrix-based approach will be used.

Basis of Assessment of Woodlands – Ancient and Other Woodland Values

6.3.30 The basis for assessing the value of ancient or quasi-ancient woodland and other (ordinary) woodland values are set out below at 6.4.12 *et seq*. where it is more appropriate to do so after considering together the implications of the Government’s Control of Woodland Policy and the Ancient Woodland Inventory.

Basis for Assessing Significance of Effects

6.3.31 **Table 6-1** sets out the criteria for assessing the sensitivity of receptors to change.

Table 6-1: Criteria for Assessing Receptor Sensitivity

Receptor Sensitivity	Description
Low	Receptors with a high capacity to accommodate change, low value or poor condition and no significant uses.
Medium	Receptors with a moderate capacity to accommodate change, medium value or condition and limited use.
High	Receptors with a low capacity to accommodate change, high value or condition and significant use.

6.3.32 **Table 6-2** sets out the criteria for assessing the likely magnitude of the change due to the proposed development upon identified sensitive receptors.

Table 6-2: Criteria for Assessing Magnitude of Change

Substantial	Negative - Permanent impact(s) resulting in the total loss the integrity of the Site or conservation status of a habitat, species assemblage/community population or group. Positive - Significant improvements of resource quality, restoration and enhancement on an extensive scale, significant improvement of attribute quality. Significant improvement in Local Green Infrastructure.
High	Negative - Permanent or long-term impact(s) on the integrity of the Site or conservation status of a habitat, species assemblage/community population or group, which is likely to threaten its sustainability. Positive - Large scale or major improvement of resource quality; extensive restoration or enhancement; major improvement of attribute quality.
Moderate	Negative - Permanent or long-term impact(s) on the integrity of the Site or conservation status of a habitat, species assemblage/community population or group, which is unlikely to threaten its sustainability. Positive - Benefit to, or addition of, key characteristics, features or elements; improvement of attribute quality.
Minor	Negative - Short term and reversible impact(s) on the integrity of the Site or conservation status of a habitat, species assemblage/community population or group that is within the range of variation normally experienced between years. Positive - Minor benefit to, or addition of, one or more key characteristics, features or elements; some beneficial impact on attribute or a reduced risk of negative impact occurring.
Negligible/ Neutral	Negative - Short term and reversible impact that is within the range of annual variation. Positive - Very minor benefit to or positive addition of one or more characteristics, features or elements. Neutral – Negative change offset equally by positive change

6.3.33 The criteria set out in **Tables 6-1** and **6-2** have been used to develop a simple matrix to assess the significance of likely effects of the proposed development on the tree and woodland environment, as shown in **Table 6-3** below.

Table 6-3 Criteria for Assessing Significance of Effects

Sensitivity of Receptor	Magnitude of Change			
	Substantial	**Moderate**	**Slight**	**Negligible/None**
High	Major	Major	Moderate	Negligible/Neutral
Medium	Major	Moderate	Minor	Negligible/Neutral
Low	Moderate	Minor	Minor	Negligible/Neutral

6.3.34 NB. In all cases the effect of woodland, group and tree removals or damage without mitigation is to be assessed as 'negative'. The net result after embedded and additional mitigation can be considered separately, and may be 'positive', 'neutral' or 'negative'.

6.4 Baseline Conditions

Woodlands – Tree Cover

6.4.1 The main areas of tree cover within the Site are described in **Table 6.4** below and marked on the Tree Cover plans at **Appendix 6.1.**

Table 6-4: Areas of Tree Cover

Areas of Tree Cover	'Parameters Plan' Zone	Description	Area (Ha)
A	**D**	**Staff Accommodation Area**	
A.1	D	Mixed dense semi-mature native broadleaf (ash, rowan, hazel, willow, birch cherry, oak), planted, with occasional tree guards still in place. Bounded on roadside hawthorn and young but established beech hedging. UNAFFECTED BY DEVELOPMENT PROPOSALS.	0.58
A.2.1 A.2.2 and A.2.3	D	Mixed dense semi-mature native broadleaf (ash, rowan, hazel, willow, birch cherry, oak), planted, with occasional tree guards still in place. Bounded on roadside and NW by hawthorn and young but established beech hedging. Split by 10m wide tree-free gap for access to high pressure pipeline. A.2.2 and a.2.3 notionally in Ancient Woodland Inventory but trees are young to semi mature only. Small area of Japanese Knotweed noted. A.2.1 UNAFFECTED BY DEVELOPMENT PROPOSALS.	0.14, 0.03, 0.32
A.3	D	Road edge with mounded material planted with early mature Larch to 20m height and occasional Douglas Fir. UNAFFECTED BY DEVELOPMENT PROPOSALS.	0.24
A.4	D	Elevated area to south of AWI area, mixed young to early mature native or naturalized broadleaf including sycamore, oak and birch.	0.18
A.5.1 and A 5.2	D	Line of tall mature trees along fence, split by pipeline servitude area. Beech, ash, douglas fir and lime.	0.02, 0.01
B	**E**	**Woodbank Area**	
B.1	E	Remnant of line of planted beech trees	0.08
B.2	E	Mixed mainly non-native deciduous with occasional ornamental non-native conifers and a few yews. Dominated numerically by semi mature sycamore, with early mature oak and semi-mature ash. On slopes, occasionally dense understory of bamboo, rhododendron, cherry laurel, Portuguese laurel and other non-native shrubs. Natural glades either absent or	1.16

Areas of Tree Cover	'Parameters Plan' Zone	Description	Area (Ha)
		colonized by bamboo. More fully described in tree survey report of December 2022.	
B.3	E	Predominantly ornamental species including lawsons cypress, lime, giant redwood and spruce. Understory or interspersal of evergreen shrubs. More fully described in tree survey report of December 2022.	0.21
B.4	E	Scrubby mixed deciduous native trees (dominated by willow and birch) on brownfield and disturbed ground including former walled garden and greenhouses. More fully described in tree survey report of December 2022.	0.37
C-D	**C-D**	**Pierhead Area**	
C	C	Artificial mound. Mixed native deciduous and evergreen, young, ridge-and-furrow planted. Pine, alder, willow, birch, hazel and other.	0.27
D	C	Artificial mound. Mixed native deciduous and evergreen, young, ridge-and-furrow planted. Pine, alder, willow, birch, hazel and other.	0.56
E-L	**B**	**Riverside Area**	
E	B	Mixed dense native deciduous dominated by young and semi mature alder and birch.	0.34
F	B	Mixed native deciduous dominated by early mature birch.	0.18
G	B	Mixed native and naturalized deciduous, dominated by birch and sycamore, occasional mature specimens.	0.85
H	B	Mixed native deciduous dominated by early mature birch and occasional larger sycamore.	0.07
I	B	Mixed native and naturalised deciduous, dominated by early mature to mature birch.	0.41
J	B	Mixed native and naturalised deciduous, dominated by early mature to mature birch.	0.07
K	B	Mixed native and naturalised deciduous, dominated by early mature to mature birch. Occasional larger early mature sycamore and mature goat willow.	1.39
L	B	Mixed native and naturalised deciduous, with roadside edge rich in hazel. Evidence of planted origin. Semi mature and early mature sycamore, willow, birch and slender ash. Occasional cherry and some elm to north. Occasional clearings or grass and bluebell ground layer.	0.73
M	**D**	**Boathouse Area**	
M	D	Mixed native and naturalized broadleaf regeneration and scrub. Not woodland.	<0.02

6.4.2 All other areas of tree cover within the Site were found to be too small or of less than 20% canopy cover and therefore being outwith the adopted definition of woodland. Hereinafter trees in these areas are treated as individuals or groups.

6.4.3 The Site includes parts of three areas identified in the AWI as provisionally being Long-established woodlands of plantation origin (LEPO), interpreted as plantation from maps of 1750 (1b1) or 1860 (2b) and continuously wooded since. The Inventory reasons that many of these

sites have developed semi-natural characteristics, especially the oldest ones, which may be as rich as Ancient Woodland.

6.4.4 The Boathouse Area of Parameter Plan Zone D is within a larger area that is subject to the "Loch Lomond and The Trossachs National Park Authority Tree Preservation Order Number 10 of 2018" (**Appendix 6.2**). The Order is a 'Woodland' type that protects trees present not just at the time the Order was made but also any subsequent planted or naturally regenerated trees. The Order notionally comprises woodland of Alder (*Alnus spp*), Ash (*Fraxinus excelsior*), Beech (*Fagus sylvatica*), Birch spp (*Betula spp*), Hawthorn (*Crataegus monogyna*), Holly (*Ilex aquifolium*), Pine (*Pinus spp*) Oak (*Quercus spp*), Spruce (*Picea spp*), Sycamore (*Acer pseudoplatanus*), Western Hemlock (*Tsuga hetrophylla*) and Willow spp (*Salix spp*).

6.4.5 Some of these species are present within the Boathouse Area, in the form of coppice-style young and semi-mature trees.

Woodlands - Control of Woodland Removal Policy

6.4.6 Scottish Planning Policy 2020 (SPP) states that:

"…the planning system should… protect and enhance ancient semi-natural woodland as an important and irreplaceable resource, together with other native or long-established woods (paragraph 194)."

6.4.7 Giving effect to this, the Government's Control of Woodland Removal Policy sets out two scenarios regarding woodland removal: first, woodland removal without a requirement for compensatory planting, and secondly, woodland removal with a need for compensatory planting. The guiding principles for the acceptability or otherwise of woodland removal most relevant to the Site and the Proposal are as follows:

- There is a strong presumption in favour of protecting Scotland's woodland resources;
- Woodland removal should be allowed only where it would achieve significant and clearly defined additional public benefits. In appropriate cases a proposal for compensatory planting may form part of this balance;
- Approval for woodland removal should be conditional on the undertaking of actions to ensure full delivery of the defined additional public benefits;
- Planning conditions and agreements are used to mitigate the environmental impacts arising from development and Forestry Commission Scotland will also encourage their application to development-related woodland removal; and,
- Where felling is permitted but woodland removal is not supported, conditions conducive to woodland regeneration should be maintained through adherence to good forestry practice as defined in the UK Forestry Standard.

6.4.8 In the Policy, woodland removal, without a requirement for compensatory planting, is most likely to be appropriate where it would contribute significantly to:

- Enhancing priority habitats and their connectivity;
- Enhancing populations of priority species;
- Enhancing nationally important landscapes, designated historic environments and geological Sites of Special Scientific Interest (SSSI);
- Improving conservation of water or soil resources; or,
- Public safety.

6.4.9 The Policy states that "Woodland removal, with compensatory planting, is most likely to be appropriate where it would contribute significantly to:

- Helping Scotland mitigate and adapt to climate change;
- Enhancing sustainable economic growth or rural/community development;
- Supporting Scotland as a tourist destination;
- Encouraging recreational activities and public enjoyment of the

- Outdoor environment;
- Reducing natural threats to forests or other land; or,
- Increasing the social, economic or environmental quality of Scotland's woodland cover."=

6.4.10 As well as demonstrating the mitigation against tree losses or damage (including within woodlands), this chapter must therefore also identify the general quantum of woodland losses within the context of a PPiP so that compensatory replanting can be proposed and secured through the use of appropriate planning conditions.

6.4.11 An assessment of additional public benefits and significant contributions to other public interest factors under the Policy is dealt with in other chapters of the EIA.

Woodlands - Basis of Ancient Woodland Values

6.4.12 In the Policy there will be a strong presumption against removing the several types of woodland including in particular (i) ancient semi-natural woodland or (ii) woodlands listed as 'Plantations on Ancient Woodland Sites' (PAWS).

6.4.13 The Policy documents explain that Ancient Woods are important because:

- They include all remnants of Scotland's original woodland; their flora and fauna may preserve elements of the natural composition of the original Atlantic forests;
- They usually have much richer wildlife than that of more recent woods;
- They preserve the integrity of soil ecological processes and associated biodiversity;
- Some have been managed by traditional methods for centuries and demonstrate an enduring relationship between people and nature;
- Woods and veteran trees are ancient monuments whose value to the local community and historians may be as great as that of the older buildings in a parish; and,
- Once destroyed, they cannot be recreated.

6.4.14 Areas within the Site are included in NatureScot's Ancient Woodland Inventory ("AWI"). The Ancient Woodland Inventory (AWI) is a provisional guide to the location of Ancient Woodland in Scotland. Some of these areas might therefore be ancient semi-natural woodland affected by the Policy.

6.4.15 The Inventory cautions that the AWI was derived from the Roy maps (c1750) and the OS 1st edition (c1860). It is not definitive and should be used with care; when evaluating woods it is important to:

- Examine the site on the ground, looking for archaeological, biological and other indicators of antiquity and of its current biodiversity value;
- Examine old maps; the OS 1st edition and Roy maps are available on www.nls.uk. Woods not shown on the AWI, but present on the historic maps, are likely to be ancient and should be treated as such unless evidence is available to the contrary; and,
- Seek specialist advice if in doubt.

6.4.16 This approach is echoed in the Woodland Trust document "Planning for Ancient Woodland - Planner's Manual for Ancient 'Woodland and Veteran Trees October 2017 (Scottish edition)"

6.4.17 This chapter must therefore assess whether the provisionally identified areas (or parts thereof) have archaeological, biological and other indicators of antiquity and of current biodiversity value that indicate remaining Ancient Woodland values that should be preserved or, where reasonably possible, restored.

6.4.18 Restoration does not mean replanting with native species, although that may form part of a restoration proposal. Restoration involves re-establishing a functioning native woodland ecosystem by:

- Securing features from the former ancient semi-natural woodland;
- Removing introduced species of trees, shrubs, and other plants;
- Encouraging the re-establishment of native species; and,

- Initiating or enhancing ecological processes which may be absent or damaged (such as appropriate grazing regimes).

6.4.19 In most circumstances the aim of restoration will be to create the conditions needed to promote the development of native woodland over the longer term. Complete reinstatement of past conditions is not a realistic target.

6.4.20 If no relict ancient woodland features are present and by the passage of time cannot reasonably be expected to re-establish themselves, then woodland removal should be assessed under the Policy as 'more appropriate when accompanied by compensatory replanting' rather than a 'presumption against Ancient Woodland loss'.

6.4.21 In all other cases an assessment of the value of the ancient woodland habitat is required. The value combines the evidence-based assessment of several features and components of the woodland which together indicate quality, sensitivity and probability of relict ancient woodland characteristics and their potential for restoration.

6.4.22 National or local significance is not of overriding importance, since all ancient semi natural woodlands are considered equally important, distinguished largely by their quality. Following the advice of NatureScot, all Ancient Semi Natural Woodland sites will be considered to be Regional/Local importance.

6.4.23 **Table 6-5** (below) sets out the criteria of ancient woodland value to be applied to each area within the Ancient Woodland Inventory shapes.

Table 6-5: Ancient Woodland Value

Value	Features / Components of Woodland
High	▪ The woodland has significant biodiversity value and quality including cultural/historic heritage values; ▪ The majority of trees are native, in a wide range of life stages, statures and conditions and dominated by climax species; ▪ Significant numbers of veteran and /or ancient trees supporting continuity of deadwood and animal habitat are present; ▪ Veteran and/or ancient trees are present which are providing additional habitats including sustainable fungal associations; ▪ No / low, cover and numbers of eradicable, invasive species; ▪ A high number of Ancient Woodland Vascular Plant indicator species are present; ▪ Close correlation with a relevant National Vegetation (or equivalent EUNIS) Classification/Biodiversity Action Plan habitat(s); ▪ Predominantly undisturbed soils with evolved mycorrhizal associations (symbiotic relationship between fungi and plants); ▪ Map and aerial photographic evidence of continuity of tree cover since at least 1860; ▪ No or nearly no gaps in tree cover; ▪ Recent survey-based evidence will generally correspond with existing AWI interpretations such as Ancient Semi Natural Woodland or Long-Established Plantation Origin; and, ▪ No or minimal need for active restoration.
Medium	▪ The woodland has moderate biodiversity value and quality including cultural/historic values; ▪ Significant proportions of non-native or non-naturalised tree species are established. Restricted age classes of trees are represented and exclude 'late-mature'; ▪ The trees are typically of fair quality. There are few veteran and no ancient trees present, providing limited additional deadwood and animal habitats and only primitive fungal associations; ▪ Cover and numbers of established invasive species already influencing ecology and habitats, eradicable with some difficulty; ▪ Only a small number of Ancient Woodland Vascular Plant indicator species present; ▪ No or weak correlation with a relevant National Vegetation (or equivalent EUNIS) Classification/Biodiversity Action Plan habitat(s); ▪ Soils are at least partly disturbed or drained and may be acidified by conifer cover. Limited fungal associations; ▪ Map and aerial photographic evidence of only short breaks in continuity of tree cover since at least 1860; ▪ No or nearly no current gaps in tree cover; ▪ Recent survey-based evidence will correspond only weakly with existing AWI interpretations such as Ancient Semi Natural Woodland or Long-Established Plantation Origin; ▪ Several and/or moderately large gaps in tree cover; and, ▪ Overall site rating for restoration of native or ancient woodland sites - Medium.

Value	Features / Components of Woodland
Low	▪ The woodland comprises wholly or mainly non-native or non-naturalised tree species (or a single species); ▪ Trees are of a full range of quality and dominated by a single age class. Few or no veteran and /or ancient trees supporting continuity of deadwood and animal habitat are present; ▪ Invasive species established and having displaced native habitat and only eradicable with great difficulty; ▪ There are no Ancient Woodland Vascular Plant indicator species present; ▪ No correlation with a relevant National Vegetation (or equivalent EUNIS) Classification/Biodiversity Action Plan habitat(s); ▪ Soils have been disturbed by ridge and furrow ploughing or drainage and may be acidified and toxified by conifer cover. Weak or no mycorrhizal associations; ▪ Map and aerial photographic evidence of long breaks in continuity of tree cover since at least 1860; ▪ Many and/or large gaps in tree cover, or currently no tree cover; and, ▪ Overall site rating for restoration of native or ancient woodland sites – Low.

Woodlands - Basis of Other (Ordinary) Woodland Values

6.4.24 Other woodland value will be assessed on a similar basis but on a reduced set of criteria. **Table 6-6** (below) sets out the criteria of other woodland value to be applied to each area of tree cover outwith the AWI areas.

Table 6-6: Other Woodland Value

Value	Features / Components of Woodland
High	▪ The woodland has significant biodiversity value and stock quality; ▪ Tree populations are established and independent with high wind firmness; ▪ The majority of trees are native or with proven resilience to climate change and endemic pests and diseases; ▪ Significant numbers of trees features supporting continuity of deadwood and animal habitat are present; ▪ No / low, cover and numbers of eradicable, invasive species; ▪ Close correlation with a relevant National Vegetation (or equivalent EUNIS) Classification/Biodiversity Action Plan habitat(s), even if artificially created; ▪ Terrain and facilities make public access easy for most people; ▪ Many/Very Many potential users nearby; ▪ Prominent/Very Prominent; ▪ Little surrounding woodland; and, ▪ Large size.
Medium	▪ The woodland has moderate biodiversity value and stock quality; ▪ Tree populations are becoming established and independent but prone to peripheral storm damage; ▪ About half the trees are native or with proven resilience to climate change and endemic pests and diseases; ▪ A few tree features supporting continuity of deadwood and animal habitat are present; ▪ Some, eradicable, invasive species present; ▪ Moderate correlation with a relevant National Vegetation (or equivalent EUNIS) Classification/Biodiversity Action Plan habitat(s), even if artificially created; ▪ Terrain and facilities limit public access; ▪ Some potential users nearby; ▪ Visible but not prominent; ▪ Surrounding area 5 to 25% wooded; and, ▪ Medium/Small size.
Low	▪ The woodland has low biodiversity value and stock quality; ▪ Tree populations are not yet established or independent and are prone to windthrow; ▪ Few of the trees are native and are unlikely to be resilient to climate change or endemic pests and diseases; ▪ Few or no trees features supporting continuity of deadwood and animal habitat; ▪ Significant level and numbers of invasive species, eradicable with difficulty; ▪ No correlation with a relevant National Vegetation (or equivalent EUNIS) Classification/Biodiversity Action Plan habitat(s); ▪ Terrain and facilities make public access difficult for most people; ▪ Few potential users nearby; ▪ Secluded;

Value	Features / Components of Woodland
	▪ Much surrounding woodland; and, ▪ Very small.

Woodlands - Tree Preservation Order Amenity

6.4.25 LLTNPA Tree Preservation Order Number 10 of 2018 covers a large area to the north west of Lomond Shores and includes the Boathouse Area. A copy of the Order is provided at **Appendix 6.2.**

6.4.26 In making the Order in 2018, LLTNPA stated that "the area affected by this Order forms part of a larger woodland linking the loch shore to the wider woodland running south and forms a woodland habitat corridor linking the loch shore with the woodlands to the north and west. The woodland also creates a transition from the urban setting of Lomond Shores into the listed buildings of Cameron House and its formal grounds." It considered it expedient to make the Order to protect an area of woodland between Lomond Shores and Cameron due to its contribution to the amenity of the Drumkinnon Bay area.

6.4.27 There is therefore a presumption against the removal of trees in this area without the express written permission of the Planning Authority. The Order states that there is an exemption from the requirement for permission where the cutting down, topping, lopping or uprooting of a tree where that work is required to enable a person to carry out works to implement a planning permission (other than an outline planning permission or planning permission in principle).

6.4.28 The grant of Planning Permission in Principle would not allow development of the Boathouse Area until detailed planning permission was subsequently granted, and which could expressly or implicitly include tree works on the Boathouse Area site. The importance of the woodland to the amenity of the area is underlined by the Order. However, only part of the whole promontory is in the Site, and the acceptability of development of the Boathouse Area may depend on the provision of tree planting within it to contribute to and accelerate the consolidation of tree amenity on the whole promontory.

Woodlands - Ancient Woodland Quality Assessment

6.4.29 A combination of desk-based assessment and site survey has been undertaken to assess the AWI extents and their surrounding context and the current condition and value of woodland areas on the Site.

6.4.30 Trees within the AWI extents may comprise individual trees, groups or woodland. If these have been found to comprise the last of these, a more detailed assessment of their ancient woodland character is required. Otherwise, they are addressed and individuals or groups with negligible associated ancient woodland habitat or restoration potential, which in accordance with the Control of Woodland Removal Policy should be assessed as' more appropriate when accompanied by compensatory replanting' rather than as 'presumption against Ancient Woodland loss'.

6.4.31 Using data from a habitat survey of the Site for **Chapter 5** of the EIAR (**Appendix 5.1**), a comparison was made between the flora present on the parts of the site covered by the Ancient Woodland Inventory and the published list of 'Ancient woodland indicator plants in Scotland'. This showed that with one sub-area exception no ancient woodland indicator species were present.

6.4.32 The exception is the most north westerly part of the Woodbank area, where ancient woodland indicator species Wood Sorrel (*Oxalis acetosa*), Pignut (*Conopodium majus)*, Common Figwort (*Scrophularia nodosa*) and Wild Garlic (*Allium ursinum*) were noted. No woody perennial indicator species were noted.

6.4.33 Using data from the tree survey, woodland walkover and other available sources, a comparison was made between the flora present and the European Nature Information System (EUNIS) list of habitats, cross referenced to the National Vegetation Classification (now superseded by EUNIS) [ref 8].

6.4.34 No correspondence was found between the tree cover within the AWI areas and any one EUNIS habitat type. During the comparison it was noted that EUNIS woodland types with climax

species other than those present on the Site could largely be dismissed with the exception of those dominated by Pedunculate Oak (*Quercus robur*), Ash (*Fraxinus excelsior*) and Beech (*Fagus sylvatica*).

6.4.35 The first two mentioned have no EUNIS habitats that resemble the AWI parts of the site, through a combination of dilution of the climax species by incongruent species (Sycamore (*Acer pseudoplatanus*) in particular) and the absence of essential EUNIS community species.

6.4.36 The last mentioned is noted in the EUNIS list as only ever found of plantation origin and therefore conflicting with the principle of relict ancient woodland habitat. Beech habitat type in Scotland is restricted to areas south of the Southern Uplands.

6.4.37 An analysis of old maps and aerial photography is provided within **Appendix 6.3**.

6.4.38 This indicates that the AWI shape around Woodbank House is approximate and wrongly placed, and thus suggests historic tree cover within the field area and to the south of the site, where historic mapping counter-indicates no tree cover. Progressive development of Woodbank House and its ornamental and horticultural facilities shows significant clearance, man made changes in landform and path developments that together replaced about 55% of the previous land use on the site and within the corrected position of the AWI shape. The mapping suggests changes in tree mix, reduction in cover and periods of shrub or small tree cover in large parts of the remainder.

6.4.39 The analysis also looks at the Drumkinnon Wood AWI shape, but this is significant only in the south west edge where a remnant of possible tree cover remains along the edge of the public road that now severs this fragment from the remainder of the Drumkinnon Woods AWI shape and, where development of staff accommodation is proposed.

6.4.40 The detailed tree survey of the Woodbank area (see below) and the walkover survey of the remaining parts of the Site have yielded other indications of continuity, discontinuity, fragmentation, changes in character and past disruptions. This is summarised at **Appendix 6.4.**

6.4.41 The analysis indicates that there has been a break in tree cover at the Boathouse area from at least 1914 until 1960, and the walkover survey indicated that there were only young to semi-mature trees present over less than half of it, which further suggests that the break in cover may have been considerably longer.

6.4.42 **Table 6-7** (below) gives the results of the assessment of ancient woodland value for each of the areas by criteria and overall.

Table 6-7: Assessment of Ancient Woodland Value

Area	A	A.2.2/3	A.4	A.5	B	B.1	B.2	B.3	B.4
Biodiversity		M	M	L		L	M	L	M
Native Trees		H	M	L		L	M	L	M
Age Range		L	L	L		L	L	M	L
Condition Range		M	L	L		M	L	L	M
Ancient/Veteran Trees		L	L	L		L	L	L	L
No Invasive Species		M	H	H		H	H	H	M
Ancient Woodland Indicator Species		L	L	L		L	M	L	L
EUNIS/NVC Community Match		L	L	L		L	L	L	L
Extent Undisturbed		L	M	L		L	M	M	L
Continuity		L	L	M		H	M	M	L
Canopy Cover		H	H	H		H	H	H	M
Restoration Potential		M	L	L		L	M	L	L
Over-All Ancient Woodland Value		**L**	**L**	**L**		**L**	**M**	**L**	**L**

L = Low; M = Medium; H = High

6.4.43 This matrix is not used as a prescriptive tool or arithmetically. The methodology and analysis of potential effects for any particular area of woodland relies partly on the exercise of professional judgement. Descriptions of effects, especially those considered significant in EIA terms, are described in narrative text.

6.4.44 The conclusion is reached that, broadly speaking, in the Woodbank AWI area there is a range of values from Low in the Southern half and Medium in the Northern half, while in the Staff Area AWI area there is predominantly Low Value. The value of the Boathouse Area is assessed as Low.

Trees and Groups

6.4.45 For the Woodbank House area, a *Tree Survey* has been undertaken in accordance with BS 5837: 2012. This identified trees and tree groups in the Site, noting their locations, species, dimensions, life stage, estimated remaining amenity contribution and condition. The constraints above and below ground that they would pose to any form of development have been established and plotted. Trees have been categorised as either Category A, B, C or U. **Table 1** of BS5837:2012 defines these categories, summarised as follows:

- Category A: Trees of high quality with an estimated remaining life expectancy of at least 40 years;
- Category B: Trees of moderate quality with an estimated remaining life expectancy of at least 20 years;
- Category C: Trees of low quality with an estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter below 150mm; and,
- Category U: Those in such a condition that they cannot realistically be retained as living trees in the context of the current land use for longer than 10 years.

6.4.46 The results of the tree survey, further description of these categories and the methodology for assessing them is provided within BS5837 2012 and **Appendix 5** of the **Tree Survey Report** (**Appendix 6.4**).

6.4.47 Although much of the Woodbank House area is classified as 'woodland', individual trees in the woodlands and individual trees and groups out with the woodland areas have also been identified and categorised and their spatial constraints established.

6.4.48 At the detailed design stage, a similar survey for the remaining areas would be undertaken in accordance with BS 5837 2012 to identify and categorise individual trees and groups and establish their spatial constraints. Corresponding tree positions would be accurately and precisely established using existing and supplementary topographic survey data.

6.4.49 The key spatial constraints for trees, identified and established by the BS 5837 2012 surveys are:

- Root protection areas;
- Crown spreads;
- Crown clear heights; and,
- Height and direction of first significant branch.
- Supplemented where necessary by:
  - Shadowing and shading; and,
  - Risk or perceived risk from falling trees.

6.4.50 These last two constraints can give rise to pressure for pruning or removal of trees relative to permanent dwellings and gardens but are either less relevant or not relevant to holiday accommodation and non-residential buildings, where proximity to trees is widely perceived as a benefit. They cannot be addressed by BS5837 2012 but where design may be sensitive to them an assessment can be provided in accordance with BS EN17037 2018 and accompanying implementation guidance and using an established system of objective risk assessment such as Quantified Tree Risk Assessment ("QTRA"). The latter may then form part of a regular review of tree risk within a Tree and Woodland Management Plan.

6.5 Embedded Mitigation

6.5.1 Mitigation measures are designed to avoid, reduce or offset adverse effects arising from the Proposals. By taking a flexible approach to design and building a degree of mitigation into the

design through an iterative process from the outset, the overall scale of adverse effects can be reduced.

Design Stage

6.5.2 Detailed design will use up-to-date tree survey data, topographic positioning and tree constraints data to:

- Prevent the unavoidable loss of Category A and B trees;
- Minimise the loss of Category C or Category U trees;
- Make allowance for viable space for replacement individual replacement tree planting;
- Avoid damage to underground constraints, particularly by avoiding construction and construction activities within the root protection area (RPA) of trees including the use of no-compaction no-dig cellular confinement systems [ref 13] and other specialised techniques and products where minor incursions into root protection areas are necessary;
- Avoid or minimise the need for crown lifting or reduction by making use of areas beneath clear crown heights and significant branches;
- Following the published recommendations of the Ancient Tree Forum, additional rooting volume will be protected for any veteran trees that are identified at the survey stage; and,
- Draw up a programme of systematic eradication or control of invasive non-native species; methodologies must reflect and avoid the risk of collateral damage to trees and native or naturalised species, especially in areas of relict ancient woodland habitat.

6.5.3 The detailed design will then be assessed for impact on trees, with further design iterations until the impacts are deemed acceptable.

6.5.4 An Arboricultural Impact Assessment will be prepared in accordance with BS5837 2012 for any detailed application. The Assessment will include Tree Protection Plans and Arboricultural Method Statements setting out the extent of construction exclusion zones, precautionary zones, special procedures, barrier types and positions and the timing of protection measures and arboricultural supervision and monitoring before, during and after construction.

Additional Mitigation Measures in Ancient Woodland Areas

6.5.5 In addition (where appropriate), within areas of any residual ancient woodland habitat the following measures will be applied:

- A Draft Woodland Management Plan will be produced to complement an inform detailed design work, by setting out the vision for the long-term management of the woodland area, the protection, consolidation and encouragement of remnant ancient woodland communities and additional planting to increase the proportion of native flora and fauna at an ecologically appropriate pace;
- Where tree losses are unavoidable or desirable, non-native, or non-naturalised tree species will be selected for removal;
- The precise position of proposed woodland bothies will be informed by this, by opportunities presented after the clearance of extensive areas of invasive non-native species and by the pro-active creation of quasi-natural clearings to imitate the desirable natural phenomenon of woodland glades that are required for the development of woodland floor plant communities;
- Where trees have downgraded to Category C or U due to deteriorating condition, and where space allows, these will be retained in reduced, safe, form as habitat poles and deadwood will be left in-situ or moved to stable positions to build up a stock of long-term deadwood habitat;
- Close to trees, lodges and pods will be designed to be built on stilts such than the area beneath them is fully ventilated and roof drainage is redistributed into the solum to allow for the ongoing vitality of roots and rooting soil; and,
- No underground connection of services is to be proposed for pods within woodlands; electricity connections are to be provided by overhead lines or surface conduits.

Construction Phase

6.5.6 The procedures, protective measures and requirements for arboricultural supervision and monitoring set out in the Arboricultural Impact Assessment and Tree Protection Plans will be covered by (i) appropriate planning conditions (ii) the appointment of a project arboriculturist and (iii) adoption of the tree protection regime in all relevant contract and sub-contract documents.

Operational Phase

6.5.7 Use of the developed parts of the Site with new and retained woodland areas and any individual or group replanting will be pro-actively managed to ensure that public access, occupation of buildings and associated vehicular accesses and parking etc. are conducted whilst respecting the sensitivities of trees, groups and woodlands and the established aims and objectives of the Woodland Management Plan(s) (see 6.8.7 *et seq.* below).

6.5.8 The management will include areas of compensatory planting (see 6.8.3 *et seq*. below) which will be required as part of the overall mitigation measures arising from compliance with the Scottish Government's Control of Woodland Removal Policy and LLLTNPA Policies.

6.6 Assessment of Impact

Woodlands

6.6.1 Through a combination of the stated design aspirations set out in the Design & Access Statement and the requirement to comply at the detailed planning permission stage with all relevant planning policies, the impacts are assessed on the assumption that all embedded mitigation will have been or will be incorporated into the development form as an inherent part of the Proposed Development.

6.6.2 The Proposal comprises several types of development within woodlands, as shown on the submitted indicative masterplan. These and the likely impacts after embedded mitigation are as follows.

6.6.3 **Table 6-8** Assessment of Impact – Woodlands**8** below presents the assessment of impact for all identified woodlands which have the potential to be impacted by the Proposed Development. The sensitivity, magnitude of change and pre/post mitigation significance of effects are summarised in the table in **Appendix 6.5**.

Table 6-8 Assessment of Impact – Woodlands

Receptor	Description	Potential Impact	Mitigation	Assessment Score
Woodlands				
Woodland Bothies	Freestanding widely spaced prefabricated holiday accommodation on stilts, without below-ground service connections and only pedestrian access. These are proposed within AWI areas. The proposal is based on the presumed avoidance of trees and the targeting of individual bothies in positions that are currently over-run with Invasive Non-Native Species and/or in created quasi-natural clearings.	Loss of small areas of poorest quality woodland floor: minor recoverable damage to tree roots outwith Root Protection Areas; minor tree crown lifting to facilitate construction access; additional pressure on area due to vandalism, fires, spillages, domestic pets, refuse.	Invasive non-native species eradication; opening up of woodland floor to woodland plant communities, progressive replacement of non-native tree and shrub species with native species, progressive improvement of tree age range and deadwood habitat.	Minor positive

Receptor	Description	Potential Impact	Mitigation	Assessment Score
Woodland Lodges	Freestanding chalet-type holiday accommodation with more traditional foundations and below-ground service connections and vehicular access and parking. These are proposed within AWI areas only in the former walled garden and field area to the south. The majority are proposed within open areas, within areas of sparse tree cover, and within areas of continuous or near-continuous tree cover.	Loss of scrubby trees in the walled garden area with negligible biodiversity legacy; loss of sparse tree cover to the south; minor recoverable damage to tree roots outwith Root Protection Areas; minor tree crown lifting to facilitate construction access.	invasive non-native species eradication, progressive replacement of non-native tree and shrub species.	Minor negative
Renovation of Woodbank House	Trees in the immediate periphery, particularly to the north of the building and to the south of the ancillary buildings, is required for car parking and this would remove small parts of tree cover in an AWI area.	Minor loss of groups and trees of negligible biodiversity legacy on the periphery of woodland; minor recoverable damage to tree roots outwith Root Protection Areas; minor tree crown lifting to facilitate construction access.	Invasive non-native species eradication, progressive replacement of non-native tree and shrub species.	Neutral
Pierhead, Visitor Hub Monorail Station, Hotel, and Indoor Water Park	This would necessitate the removal of two areas of woodland and partial removal of areas of tree cover to the east for car parking.	Removal of two areas of young or semi-mature plantation.	None.	Major negative
Staff Area, Including Staff Accommodation and a Service/Deliveries Area and Parking	This would necessitate the removal of tree cover, part of which is within an AWI area.	Permanent loss of some tree cover under footprint of building (c.300m2); permanent loss of tree cover for car parking (35 spaces), generally low or negligible.	Dense native tree and shrub planting in new buffer along adjacent residential properties; eradication of Japanese Knotweed.	Slight negative
Boathouse Area	A boathouse of c.95m2 for storage of equipment and operation of water-based activities is proposed. This would necessitate the removal of individual regenerating trees within an AWI area and subject to a Tree preservation Order.	Minor loss of low quality semi-mature coppice-style trees; minor contribution to loss of visual amenity on promontory; negligible loss of biodiversity legacy.	Selective screen planting around boathouse to accelerate return of visual amenity.	Minor negative

Receptor	Description	Potential Impact	Mitigation	Assessment Score
Riverside Parking Area (West of Pier Road)	This would necessitate the removal of the majority of a woodland area, but with retention and reinforcement of woodland strips adjacent to existing housing.	Permanent loss of low-medium quality semi mature trees.	Dense native tree and shrub planting in new buffer along adjacent residential properties.	Moderate negative

Trees and Groups

Basis of Assessment of Sensitivity and Significance - Trees and Groups

6.6.4 The accompanying Design & Access Statement sets out the intention to avoid the loss of individual trees. Because the application is for PPiP, no detailed design of the Proposed Development is available or required other than to indicative location and scale of development. It is therefore not possible to assess the impact on individual trees or groups of trees at this stage of the planning process. In preference, embedded mitigation measures for the minimisation and avoidance of tree losses or damage is proposed to be delivered at the detailed design stage.

6.7 Post-Mitigation Assessment of Impacts

Woodlands

6.7.1 The assessment of significance of effects after embedded mitigation is summarised in **Table 6-5**.

6.8 Further Mitigation and Enhancement

6.8.1 Further mitigation will be provided at the detailed stage of planning and will include the following:

Compensatory Planting

6.8.2 The strategy for the proposed development and woodland management of the Site is to avoid development into woodland areas as far as possible, whilst taking account of other constraints such as the need to respect the heritage setting of parts of the Site. Where a need for development results in woodland removal, development has been located preferentially in

- Areas of woodland that are assessed as having low baseline value in accord with the criteria set out in Methodology section of this assessment and the least sensitive to change in terms of effects upon the landscape setting of the Site; and,
- Areas of sparse tree cover that do not constitute woodland.

6.8.3 Where woodland removal is inherent, losses will be replaced elsewhere within the Site by an equivalent area of new planting. The woodland management strategy adopted by the Development will aim to replace poor quality woodland with more appropriate native tree species as well as enhance areas of woodland on the Site through management actions. This will result in better quality, more accessible and more resilient woodland in the long term. New planting on the Site will provide biodiverse mix of native pioneer and climax species. This will improve overall collective biodiversity of the woodlands on the Site. Suitable species selection the new woodland areas also means that the woodland will be resilient to extreme climate change events and less susceptible to windthrow and pests.

6.8.4 The indicative areas of compensatory planting in the indicative masterplan are shown on the plan comprising **Appendix 6.6**.

6.8.5 **Table 6-9** below summarises the approximate scale of woodland removal and compensatory planting.

Table 6-9: Scale of Woodland Removal and Compensatory Planting

Area	Loss	Gain	Net (Ha)
Woodbank	minimal	1.02	1.02
Staff area	0.10	0.00	-0.10
Boathouse	minimal	minimal	minimal
Pierhead	0.83	0.00	-0.83
Pierhead car park	0.18	0.00	-0.18
West Riverside	minimal	0.41	0.41
Riverside East of Pier Road	0.30	0.00	-0.30
TOTAL	**1.41**	**1.43**	**0.02**

6.8.6 Overall, the proposed development will result in no net loss of woodland.

Woodland Management Plan

6.8.7 It is observed that much of the woodland has been unmanaged for a considerable time and has degraded as a result. The proposed development presents the opportunity for the woodland to be positively and proactively managed. This will result in a more resilient and biodiverse woodland structure and more accessible to the public.

6.8.8 In consultation with stakeholders, managers, statutory authorities, a Woodland Management Plan will be finalised and adopted for each character area, based on the suite of management plan templates drawn up by Scottish Land and Forestry. The core concepts are -

- A clear and concise description of the woodland(s);
- A long-term vision for the woodland;
- The objectives of management;
- Management proposals for the next ten years; and,
- A mechanism for regular and future review of these.

6.9 Residual Effects – Woodlands

6.9.1 The overall significance of effects after further mitigation and enhancement are summarised in the Table at **Appendix 6.5**. These range from Moderate – Positive to Minor – negative, with an overall assessed impact of Neutral.

6.9.2 No overall net negative residual effects have been identified for the Site.

6.10 Monitoring

6.10.1 In the absence of any likely significant adverse effects, no monitoring is considered to be proportionate or required. Effective monitoring will take place through the ongoing implementation and review of the Woodland Management Plan(s).

6.11 Summary

6.11.1 The chapter details the trees and tree cover within the site. It is differentiated into nonspecialised woodland, woodland within the Ancient Woodland Inventory and individual trees and groups.

6.11.2 An assessment of old maps, aerial photographs, and relict ancient woodland within the AWI areas has been undertaken. Some adjustments to the raw AWI shapes have been found to be appropriate following the examination of old and current Ordnance Survey mapping. Ancient woodland value has been assessed by a number of appropriate overlapping criteria. Where no significant biodiversity legacy was found or likely to be present and/or where restoration potential is negligible, AWI areas have then been assessed as individuals, groups or woodlands.

6.11.3 Individual trees and groups of trees can be identified, protected by application of arboricultural survey, assessment and protection at the design, construction and operation phases and any planning conditions and additional protections deemed necessary by LLTNPA. 12 metre landscape buffer areas adjacent to existing residential development have been set aside and these represent an opportunity for net improvement of biodiversity and amenity tree and shrub density

6.11.4 A small area of the Boathouse area is within an existing TPO but is the least publicly visible part of the promontory where young and semi-mature trees have been removed in the past. Additional tree planting around the proposed building can be designed and planted to accelerate the contribution that the boathouse area makes to the visual amenity provided by the promontory area.

6.11.5 Where no relict ancient woodland features are present and by the passage of time cannot reasonably be expected to re-establish themselves, then woodland removal has been assessed under the Scottish Governments Control of Woodland Removal Policy as' more appropriate when accompanied by compensatory replanting' rather than as 'presumption against Ancient Woodland loss'. An assessment of additional public benefits and significant contributions to other public interest factors under the Policy is dealt with in other chapters of the EIAR.

6.11.6 An assessment of Sensitivity of Receptors and Magnitude of change shows some net negative impacts. However, following embedded mitigation and additional mitigation, the impacts range from Moderate Positive to Minor negative, with an overall assessment impact being **Neutral**.

6.11.7 Areas assessed as having significant quasi-ancient woodland character and/or biodiversity legacy have been identified and appropriate design stage precautionary principles are recommended. These include informing operational phase Woodland Management Plans.

6.11.8 The proposed development, woodland management and compensatory planting will ensure there will be no net loss of woodland and overall, the proposals will improve woodland quality and resilience. In particular, a Woodland Management Plan for the area of greatest identified levels of ancient woodland character will improve the quality of the woodland by the removal of large areas of dense invasive non-native species and by the consolidation, protection and encouragement of regeneration at an ecologically appropriate pace.

6.11.9 Proposed details of woodland removal and compensatory replanting would be considered at the detailed design stage. Therefore, no specific consideration has been given to the requirement for Felling Permissions at this stage. The effects of any temporary or permanent loss of tree amenity are also addressed within the **Chapter 11 – Landscape and Visual of this EIAR**. Wider considerations of the impact of the proposed development on other aspects of woodland, in particular protected species, are assessed in **Chapter 5 - Ecology of this EIAR**.

6.12 References

- BS 5837:2012 "Trees in Relation to Design, Demolition and Construction – Recommendations".
- BS EN 17037:2018 "Daylight in buildings".
- Ancient Woodland Indicator Plants in Scotland (2009) - Carol L Crawford, Principal Ecologist and Chartered Forester, The Natural Resource Consultancy.
- Scottish Government's Policy on Control of Woodland Removal: Implementation Guidance - February 2019.
- A Guide to Understanding the Scottish Ancient Woodland Inventory (AWI) - Scottish Natural Heritage (undated).
- Restoration of Native Woodland on Ancient Woodland Sites - Forestry Commission, Edinburgh 2003.
- Strachan, I.M. 2017. Manual of Terrestrial EUNIS Habitats in Scotland. Version 2. Scottish Natural Heritage Commissioned Report No. 766 and accompanying correspondence tables.
- Site Layout Planning for Daylight and Sunlight (2nd edition) - Building Research Establishment 2011.

- Quantified Tree Risk Assessment User Manual v 5.2 2016.
- Ancient and other Veteran Trees: Further Guidance on Management (2017) Ancient Tree Forum.
- Arboricultural Association Guidance Note 12 - The Use of Cellular Confinement Systems near Trees: A Guide to Good Practice 2020.

7 Noise and Vibration

7.1 Introduction

7.1.1 This chapter of the EIAR provides an assessment of the likely significant effects of noise from the proposed tourism and recreation-led mixed-use development at Lomond Banks, Balloch, West Dunbartonshire. It describes and considers the potential for noise associated with the project, both direct and in direct, and the impact that it could have on both the proposed development receptors and the existing sensitive receptors within the surrounding area.

7.1.2 The assessment is based on the characteristics of the site and surrounding area and the key parameters of the proposed development detailed in **Chapter 2 – Location and Nature of Development**.

7.1.3 This chapter has been prepared by Stantec. In line with best practice, a statement outlining the relevant expertise and qualifications of competent experts appointed to prepare this ES is provided in **Appendix 1.1 – Project Team**.

7.1.4 This chapter is supported by the following figures provided in **Volume 2 Appendix 7.1**:

- **Figure 7-1** Environmental Sound Survey Locations;
- **Figure 7-2** Noise Sensitive Receptor Locations;
- **Figure 7-3** Daytime Baseline Sound Levels $L_{A10,18hour;}$
- **Figure 7-4** Daytime Sound Levels $L_{Aeq,16hour}$ Without Proposed Development;
- **Figure 7-5** Daytime Sound Levels $L_{Aeq,16hour}$ With Proposed Development;
- **Figure 7-6** Night-time Sound Levels $L_{Aeq,8hour}$ Without Proposed Development;
- **Figure 7-7** Night-time Sound Levels $L_{Aeq,8hour}$ With Proposed Development;
- **Figure 7-8** Daytime Change in Sound Levels $L_{Aeq,16hour}$ With and Without Proposed Development; and,
- **Figure 7.9** Night-time Change in Sound Levels $L_{Aeq,8hour}$ With and Without Proposed Development.

7.2 Policy Context, Legislation, Guidance and Standards

Legislation

7.2.1 The overarching legislative framework applicable to this EIA for the proposed development is outlined in **Chapter 4 – Legislative and Planning Policy Context**.

7.2.2 Legislation which is also applicable to the noise and vibration assessment include:

- The Control of Pollution Act (CoPA) (HMSO, 1974); and,
- The Environmental Protection Act (EPA) (HMSO, 1990).

7.2.3 Further detail of relevant legislation is provided in the **Volume 2 Appendix 7.2**. accompanying this chapter.

Policy

7.2.4 The planning policy framework applicable to this EIA for the proposed development is outlined in **Chapter 4 – Legislative and Planning Policy Context**.

7.2.5 Planning policy considerations of specific relevance to this assessment are:

- Loch Lomond and the Trossachs Local Development Plan 2017-2021 (LLTNP, 2017), in particular;
- Natural Environment Policy 2: Amenity and Environmental Effects;
- Scottish Planning Policy (The Scottish Government, 2014a) in particular the following relevant provisions:

- Principal Policy on Supporting Business and Employment (paragraph 106 and 169);
- Principal Policy on Delivering Heat and Electricity (paragraph 169);
- Principal Policy on Supporting Aquaculture (paragraphs 252); and,
- National Planning Framework 3 (NPF3) (The Scottish Government, 2014b).

7.2.6 Further detail of relevant policy is provided in the **Volume 2 Appendix 7.2**. accompanying this chapter.

Guidance and Relevant Technical Standards

7.2.7 The following guidance and technical standards have informed this assessment:

- Planning Advice Note PAN 1/2011 Planning and Noise (LGCD, 2011a);
- Assessment of Noise: Technical Advice Note (EFD, 2011b);
- Department of Transport 1988: Calculation of Road Traffic Noise (CRTN) (Department for Transport Welsh Office, 1988);
- Environmental Noise Guidelines for the European Region (WHO, 2018);
- World Health Organisation (WHO) Guidelines for Community Noise 1999 (WHO, 1999);
- BS 7445:2003 Part 1 Description and Measurement of Environmental Noise. Guide to Quantities and Procedures;
- 5228-1:2009+A1:2014 Code of Practice for Noise and Vibration Control on Construction and Open Sites – Part 1: Noise;
- 5228-2:2009+A1:2014 Code of Practice for Noise and Vibration Control on Construction and Open Sites – Part 2: Vibration;
- British Standard 4142:2014 +A1:2019 Methods for Rating and Assessing Industrial and Commercial Sound;
- Design Manual for Road and Bridges – Design Manual for Road and Bridges LA 111 Traffic Noise and Vibration; and,
- Professional Practice Guidance on Planning and Noise.

7.2.8 Further detail of relevant guidance and technical standards is provided in the **Volume 2 Appendix 7.2** accompanying this chapter.

7.3 Methodology

Overview

Assessment Scope

7.3.1 This chapter presents an assessment of likely significant effects on noise and vibration sensitive receptors in and around the Proposed Development. The assessment presented in this chapter has been prepared in accordance with the EIA Regulations.

7.3.2 The principal aspects considered within this assessment are:

- Noise impacts and effects associated with the change in traffic flows due to the Proposed Development;
- Identification of mitigation and enhancement measures, where required, to address identified effects;
- Assessment of the residual predicted effects; and,
- Assessment of the cumulative effects on sensitive receptors as a result of road traffic noise from the Proposed Development in conjunction with other developments which could result in cumulative effects.

7.3.3 At the time of writing, the development is at the Planning Permission in Principle (PPiP) stage and detailed design and construction methods have not yet been determined, as such, noise assessment is not possible at this stage and is scoped out of this chapter. A Construction

Environmental Management Plan (CEMP) will be prepared prior to construction. Noise and vibration suppression techniques will be included in the CEMP and it is therefore considered that significant adverse impacts from construction noise and vibration would not occur.

Assessment Process

7.3.4 In undertaking the assessment presented in this EIAR chapter, the following activities have been carried out:

- Existing noise sensitive receptors around the Proposed Development have been determined. Noise sensitive receptors on the Proposed Development have also been determined;
- An environmental sound survey has been undertaken to establish the current sound climate during both daytime and evening periods at locations considered to be representative of the existing and future noise sensitive receptors;
- A 3D acoustic model of the Site and its surroundings has been generated, based on traffic flows provided by the Transport Consultant; and,
- An assessment of noise impact from the supplied traffic flows has been undertaken at existing and future noise sensitive receptors.

Consultation

EIA Screening and Scoping

7.3.5 An EIA Scoping Opinion was received by Loch Lomond and the Trossachs National Park in July 2021. In relation to noise and vibration, the Scoping Opinion stated:

> *"The Scoping Report notes that vibration associated with changes in traffic flows and the operation of the development are not likely to be significant and are therefore not proposed to be considered in the EIA. The response from WDC Environmental Health states that until the full development proposals are confirmed these potential effects will still require to be considered. It is suggested further consultation with WDC environmental health is undertaken with regard to inclusion (or otherwise) of these aspects during the course of developing proposals and the subsequent EIA assessment.*
>
> *The likely noise and vibration impact of the proposed transport infrastructure should also be considered.*
>
> *In assessing the likely vibration impacts from piling and other construction activities on receptors, the EIA should include the loch shore environment and specifically any habitat or species that are sensitive to vibration (reflecting advice from NS). This should cross reference the Ecology Chapter."*

7.3.6 The assessment of noise and vibration impacts on ecological receptors is presented in **Chapter 5 Ecology**.

Post Scoping Consultation

7.3.7 No further consultation has been undertaken with respect to noise and vibration.

Study Area

7.3.8 The spatial scope of and Study Area adopted in this assessment has been determined by the extent of the Proposed Development and roads included within the Transport Assessment. Noise sensitive receptors along roads within the Transport Assessment have been included within this assessment.

Information Sources

Desktop Study

7.3.9 The following information has been used within the assessment:

- Masterplan design of the site;
- Traffic flow data for the surrounding road network (18 hour AAWT) including baseline year (2019), future year (2030) without the scheme and future year (2030) with the scheme;

- Topography data of the site based on topographical survey data;
- Lidar data for areas surrounding The Site; and,
- Address Base data for existing properties within the study area.

Fieldwork

7.3.10 An environmental sound survey was carried out on Thursday 16 December 2021. Further details of the environmental sound survey are provided in **Section 7.4**.

Approach to Assessment

7.3.11 The assessment considers the impacts which the Proposed Development could have on existing receptors surrounding the Site, as well as receptors within the Proposed Development.

Impact Assessment Methodology

7.3.12 The methodology provided in Technical Advice Note (TAN) 1/2011'Assessment of Noise' (The Scottish Government, 2011b) has been used to assess the impacts of the Proposed Development.

7.3.13 The technical Advice Note details a five-stage process for assessing potential noise impacts on proposed developments. Full details of the five-stage process can be found within **Appendix 7-2** in **Section 3.1.5.**

7.3.14 The summarised criteria from the five-stage process is shown in the sections below.

Noise Generating Development

7.3.15 The magnitude of noise impact from NGDs is defined by assessing the resultant future year do something sound levels against the future year do minimum sound levels. The magnitude of impact classifications used in this assessment and shown in **Table 7-1** and are based on the classifications provided in **Table 2-3** of the Technical Advice Note of PAN 01/2011 (The Scottish Government, 2011b).

Table 7-1: Classification of Magnitude of Noise Impacts; Noise Generating Developments

Change in Noise Level, x $L_{A10,18h}$ dB	Magnitude of Impact
x = 5	Major adverse
3 = x < 5	Moderate adverse
1 = x < 3	Minor adverse
0 < x < 1	Negligible adverse
x = 0	No change
-1 < x < 0	Negligible beneficial
-3 < x = -1	Minor beneficial
-5 < x = -3	Moderate beneficial
X = -5	Major beneficial

Noise Sensitive Development

7.3.16 The magnitude of noise impact at NSDs is defined by assessing resultant do something sound levels at noise sensitive receptors. The magnitude of impact classifications used in this assessment and shown in **Table 7-2** and are based on the classifications provided in **Table 2.4** of the Technical Advice Note of PAN 01/2011 (The Scottish Government, 2011b). The below table outlines the magnitude of impact during the daytime period (07:00 – 23:00 hours).

Table 7-2: Classification of Magnitude of Noise Impacts; Noise Sensitive Developments

(Existing – 55 dB $L_{Aeq,16hour}$) Noise Level, x $L_{Aeq,16hour}$dB	Magnitude of Impact
x = 10	Major adverse
5 = x < 10	Moderate adverse
3 = x < 5	Minor adverse
0 = x < 3	Negligible adverse
x < 0	No change

7.3.17 In relation to night-time noise, the TAN notes in paragraph 3.25 that:

> *"For a continuous noise source, the recommended WHO precautionary guideline internal noise levels within dwellings is 35 dB $L_{Aeq,16h}$ for day and evening periods, this is to avoid critical effects of speech intelligibility and moderate annoyance, and to avoid sleep disturbance for the night time period 30 dB $L_{Aeq,8h}$ is reported as being representative of the noise level at which the onset of effects occur, with no, single sound events exceeding 45 dB $L_{Amax, FAST}$. The effects on sleep become increasingly more marked at levels of 35 dB $L_{Aeq,8h}$ and greater. However, the WHO levels are in respect of general environmental noise and not industrial/commercial in isolation. Therefore, the nature of the noise requires to be taken into account."*

7.3.18 Based on the above guidance, internal noise levels of below 30 dB $L_{Aeq,8hours}$ are targeted within the assessment.

7.3.19 The level of significance of the noise impact at the NSR is obtained through the relationship of the receptor's sensitivity to noise and the magnitude of the noise impact. **Table 7-3** provides a framework for determining the level of significance in relation to the magnitude of the impact and the sensitivity of the receptor. The table is based on **Table 2.6** of the Technical Advice Note of PAN 01/2011 (The Scottish Government, 2011b), and the process of determining significance in-line with **Chapter 3 EIA Process**.

Table 7-3: Matrix of Significance of Effects

Magnitude of Impact	Level of Significance Relative to Sensitivity of Receptor		
	Low	**Moderate**	**High**
Major	Minor / Moderate	Moderate / Major	Major / Substantial
Moderate	Minor	Moderate	Moderate / Major
Minor	Negligible or No Effect / Minor	Minor	Minor / Moderate
Negligible	Negligible or No Effect / Minor	Negligible or No Effect / Minor	Minor
No Change	Negligible or No Effect	Negligible or No Effect	Negligible or No Effect

7.3.20 A moderate, major or substantial effect is considered to be significant.

7.3.21 The definitions of the levels of significance are described in **Chapter 3 EIA Process**.

7.4 Baseline

The Site

7.4.1 The site is located to the north of Balloch, West Dunbartonshire on the southern shores of Loch Lomond. The site is surrounded by farming land and a golf course to the west and north-west. Loch Lomond to the north and the River Leven to the east. The land to the south and south-east consists predominately of residential and commercial properties.

Major Noise Sources

7.4.2 The engineer conducting the sound survey identified the major noise sources of the Site and surrounding area. These were noted to be:

- Road traffic on the A82 dual carriageway to the west; and,
- Road traffic on the A811 road to the south.

Receptor Sensitivity

7.4.3 The table below shows the different receptor along with their respective sensitivity areas.

Table 7-4: Receptor Sensitivity

Receptor	Sensitivity	Description
Residential dwellings, Places of worship, hospitals/residential care homes, quiet outdoor areas used for recreation (gardens).	High	Receptors where people or operations are particularly susceptible to noise.
Hotels, offices, bars/restaurants.	Medium	Receptors are moderately sensitive to noise, where it may cause some distraction or disturbance.
Buildings not occupied during daytime hours, Factories with existing high noise levels.	Low	Receptors where description or disturbance from noise is minimal.

7.4.4 The Proposed Development has hotels, bars and restaurants within the development along with commercial units.

7.4.5 A full list of the sensitive receptors can be found in the table below along with their sensitivity. The location of each receptor is identified in **Volume 2 Figure 7-2**.

Table 7-5: Noise Sensitive Receptors and Their Sensitivity

Receptor	Description	Existing or Proposed	Sensitivity
1	Residential dwelling off A82	Existing	High
2	Cameron House residential dwelling on Old Luss Road	Existing	High
3	Residential dwelling on Old Luss Road	Existing	High
4	Residential dwelling on Cameron Drive	Existing	High
5	Residential dwelling on Balloch Road	Existing	High
6	Residential dwelling on A811	Existing	High
7	Residential dwelling on A811	Existing	High
8	Residential dwelling on Balloch Road	Existing	High
9	Woodland lodge number W7	Proposed	High
10	Large Lodges number L35	Proposed	High
11	Woodland Bothy closest to A 82	Proposed	High
12	Larger Lodges number L4	Proposed	High
13	Lodge 35 of Pier Road	Proposed	High
14	Lodge 73 of Pier Road	Proposed	High

Baseline Sound Surveys

7.4.6 To obtain baseline sound conditions, sound levels were measured at seven locations within the Site. Sound levels at each of these positions were measured during daytime and evening periods for time periods of 30 minutes and 15 minutes respectively.

7.4.7 Locations of the sound survey locations are described in **Table 7.6** and identified in **Volume 2 Figure 7-1**.

Table 7.6: Environmental Sound Survey Locations

Sound Measurement Location ID	Description	Grid Reference
1	10m from A82 off Lower Stoneymollan Road	E 238089 , N 681588
2	Off Lower Stoneymollan Road	E 238152 , N 681619
3	Land off Old Luss Road near residential properties	E 238317 , N 681839
4	Wooded area between Lomond Shores car park and residential properties on Clairinish	E 238608 , N 681945
5	Entrance to the Lomond Shores retail park of Ben Lomond way	E 238593 , N 682190
6	Land in public park between Pier Road and River Leven	E 238766 , N 682317
7	Land on Public park behind Anchorage Guest House car park.	E 238956 , N 681995
8	On Old Luss Road outside Cameron House	E 238111 , N 682044

7.4.8 Measurements were carried out at Location 1 to collect data from the A82 dual carriageway road between the hours of 10:45 -13:45. The purpose of this survey location was to establish baseline sound levels from the A82. The monitoring was carried out in accordance with the shortened measurement procedure of the Calculation of Road Traffic Noise (CRTN) (Department for Transport Welsh Office, 1988)

7.4.9 Measurement values from the road traffic measurement (location 1) have been summarised and are shown below in **Table 7-7**:

Table 7-7: Road Traffic Noise Survey Results

Measurement Location	Date	Start Time/End Time (hh:mm)	$L_{Aeq, 3hour}$ (dB)	Typical $L_{A90, T}$ (dB)	Typical dB L_{AFMax} (dB)
LT	16/12/22	10:45/13:45	68		75

7.4.10 Weather conditions for the 3-hour survey are shown in **Table 7-8** below.

Table 7-8: Road Traffic Noise Survey Weather Conditions

Survey Date/Time	Weather Conditions
16/12/2022, 10:45- 13:45	9°C, 1 m/s, NW, 5/8 oktas

7.4.11 An hourly summary of results is provided in **Table 7-9**.

Table 7-9: Road Traffic Noise Survey Hourly Results

Measurement Location	Start Time/Duration hh:mm:ss	$L_{Aeq,1hour}$ (dB)	$L_{A10,1hour}$ (dB)	L_{AFMax} (dB)
LT	10:45 / 00:01:00	67	70	80
	11:45 / 00:01:00	67	70	80
	12:45 / 00:01:00	68	70	89

7.4.12 Following guidance provided in the Calculation of Road Traffic Noise (CRTN), 1dB(A) is subtracted from the average of the 3-hour L_{A10} levels to provide the L_{A10} (18 hour), as shown in **Table 7-10**.

Table 7-10: Road Traffic Noise Survey Summary of Results

Measurement Location	Measured Sound Level (dB)				
	L_{A10}, 1st hour	L_{A10}, 2nd hour	L_{A10}, 3rd hour	$L_{A10, 3hr}$	$L_{A10\ 18hr}$
LT	70.2	70.1	70.1	70.1	69.1

7.4.13 The results from the other measurement locations (Location 2-8) are summarised in **Table 7-11**.

Table 7-11: Sound Survey Results

Measurement Position	Date	Daytime/ Evening	Start Time/End Time hh:mm	Sound Level $L_{Aeq, T}$ dB
2	16/12/2021	Daytime	11:00/11:30	52
	16/12/2021	Evening	19:00/19:15	49
3	16/12/2021	Daytime	11:41/12:11	52
	16/12/2021	Evening	19:31/19:46	47
4	16/12/2021	Daytime	12:40/13:10	50*
	16/12/2021	Evening	20:20/20:35	45*
5	16/12/2021	Daytime	13:19/13:49	55
	16/12/2021	Evening	20:47/21:02	44
6	16/12/2021	Daytime	13:55/14:25	44
	16/12/2021	Evening	21:15/21:30	39
7	16/12/2021	Daytime	14:30/15:00	48
	16/12/2021	Evening	21:45/22:00	43
8	16/12/2021	Daytime	15:10/15:40	53
	16/12/2021	Evening	19:52/20:07	48

7.4.14 *Values have not been used within the assessment. At Location 4 at the time of measurement, mobile construction plant was in use during the daytime and evening. The works related to the temporary construction a drive-in cinema.

7.4.15 During the site visit the noise climate at the measurement locations was noted. **Table 7-12** below summarises the events.

Table 7-12: Sound Climate at Survey Locations

Measurement Location Position ID	Measurement Location	Description of Noise Climate Experienced During Survey
LT	10m from A82 off Lower Stoneymollan Road	Road traffic noise from the A 82 dominating the noise climate
2	Off Lower Stoneymollan Road	Road traffic from the A82 dual carriageway Dogs barking at kennels to the south Pedestrians conversing Birdsong
3	Land off Old Luss Road near residential properties	Road traffic on A82 Road noise form Old Luss Road Ambulance passing Birdsong
4	Wooded area between Lomond Shores car park and residential properties on Clairinish	Road Traffic from local roads Dog Walkers *Unrepresentative noise from mobile plant
5	Entrance to the Lomond Shores retail park of Ben Lomond way	Road traffic from Ben Lomond Way including buses stopping for passengers Pedestrians conversing
6	Land in public park between Pier Road and River Leven	Pedestrians conversing Distant road traffic Birdsong
7	Land on public park behind Anchorage Guest House car park.	Noise from the Anchorage Guest House Dogs barking

Measurement Location Position ID	Measurement Location	Description of Noise Climate Experienced During Survey
		Pedestrians conversing Distant industrial noises
8	On Old Luss Road outside Cameron House	Road traffic off Balloch Road Cars using the adjacent car park Pedestrians conversing

7.4.16 Meteorological conditions were deemed suitable for an environmental sound survey throughout the surveying period. **Table 7-13** shows conditions for both daytime and evening on the day of the survey.

Table 7-13: Sound Survey Weather Conditions

Weather Conditions - Daytime	Weather Conditions - Evening
Between 8 & 10°C, wind speed between 1 - 4 m/s, between 4/8 - 8/8 Oktas.	Between 5 & 8°C, wind speed between 1-3 m/s, from NW, between 4/4 – 6/8 Oktas.

Baseline Evolution

7.4.17 Future year traffic flows used within the assessment include relevant committed development. As the environmental sound climate is dominated by noise from vehicular movements on the modelled road network, the future baseline conditions have therefore been considered within the assessment.

7.5 Embedded Mitigation

7.5.1 The development proposal has several design features and embedded mitigation which will avoid, prevent or minimise significant adverse environmental effects and to enhance beneficial effect. Embedded mitigation measures of relevance to this assessment are:

- Development, approval and implementation of noise suppression techniques as part of a Construction Environmental Management Plan (CEMP); and,
- The design mitigation features incorporated into the final masterplan design is of one stretch of 2m high close boarded timber garden fencing at the garden /terrace boundary of NSR 11.

7.6 Assessment of Likely Effects

Construction Phase

7.6.1 At the time of writing, the development is at the Planning Permission in Principle (PPiP) stage and detailed design and construction methods have not yet been determined, as such, a quantitative noise and vibration assessment is not possible at this stage.

7.6.2 Noise and vibration suppression techniques will be developed, approved and implemented as part of a Construction Environmental Management Plan (CEMP) and it is therefore considered that significant adverse impacts from construction noise and vibration would not occur.

Operational Phase

7.6.3 There is potential for noise produced from the proposed development to have an impact on both the existing residents outside of the Proposed Development, and occupants of the resort accommodation. At the time of writing, the development is at the PPiP/ masterplan stage, therefore detailed design information on proposed commercial and entertainment noise sources is not available. If required, an assessment of commercial or entertainment noise sources can be carried out at a later date, when sufficient design information is available.

Impact Assessment

Noise Input Parameters

7.6.4 A 3D model has been produced using Soundplan V8.2, to model baseline noise levels around the site and calculate the likely future sound levels, for both with and without the Proposed Development.

7.6.5 Soundplan uses the principal methodologies as set out in the Calculation of Road Traffic Noise 1988 (CRTN), for determining the L_{A10} basic road noise level. To consider the noise data in a comparable form to PAN 01/2011, the output from Soundplan is converted into the $L_{Aeq,T}$ within the program.

Noise Sources

7.6.6 The dominant sources of noise affecting the Proposed Development site and surrounding areas have been identified as being the A82, A811, Old Luss Road and Balloch Road.

7.6.7 18-hour Annual Average Weekly Traffic (AAWT) flows for the above roads have been provided by Stantec UK and used within the noise model.

Noise Sensitive Receptors

7.6.8 The noise assessment considers the proposed residential resort properties most exposed to road noise. In addition, a sample of existing noise sensitive receptors within the surrounding areas were also considered in the noise assessment. The locations of the receptors are identified in **Volume 2 Figure 7-2**.

7.6.9 Three different Scenarios have been considered within the Soundplan model, as shown in **Table 7-14**.

Table 7-14: Modelled Scenarios

Scenario	Assessment Year	Description
1	2019	Baseline road traffic, for noise model validation purposes against measured road traffic data.
2	2030	Baseline + future committed developments (without Proposed Development).
3	2030	Baseline + future committed developments + Proposed Development.

Other Modelling Inputs

7.6.10 A number of assumptions have been made within the modelling as detailed below:

- The noise model includes the effect of site design mitigation features (i.e. a 2 m high fence to be constructed along the boundary of the garden of NSR 11);
- Baseline (2019) and 2030 models use topography supplied by Stantec UK;
- Single storey buildings have been assumed to be 6m high. Two storey buildings have been assumed to be 8 m high;
- Receptor heights at garden and ground floor level have been taken as being 1.5 m above the ground level;
- Receptors at first floor levels have been taken to be a height of 4 m above ground level; and,
- Ground absorption has been modelled as 1 (soft ground) for both scenario years.

Validation of Acoustic Model

7.6.11 The baseline acoustic model has been used to calculate existing noise levels for comparison with the with the results of the environmental sound surveys. The modelled and measured resulted are presented in **Table 7-15**.

Table 7-15: Measured and Modelled Sound Level Validation

Monitoring Position ID	Period	Measured $L_{A10,18hour}$ Noise Level (dB)	Modelled $L_{A10,18hour}$ Noise Level (dB)	Variance (dB)
LT	Daytime	70	72	< 2

7.6.12 The results in **Table 7-15** indicate a low level of variance between the modelled results and the measured data. The model is therefore considered to be representative of the current sound climate around the site.

Assessment of Impact on Noise Sensitive Receptors

7.6.13 The Proposed Development is expected to increase traffic flows on the local road network surrounding the site.

Comparison of Daytime Predicted Sound Levels

7.6.14 Sound levels in the outside amenity areas (gardens) of existing residential dwellings have been compared with and without development traffic. The results are provided in **Table 7-16**.

Table 7-16: Comparative Daytime Noise Levels, With and Without Development.

Noise Sensitive Receptor ID	2030 Without Development $L_{Aeq, 16hour}$ dB	2030 With Proposed Development $L_{Aeq, 16hour}$ dB	Difference dB	Tan 2011 Magnitude of Impact	TAN 2011 Level of Significance
1	62	62	< 1	Negligible Adverse	Minor
2	53	53	< 1	Negligible Adverse	Minor
3	51	51	< 1	Negligible Adverse	Minor
4	60	60	< 1	Negligible Adverse	Minor
5	53	53	< 1	Negligible Adverse	Minor
6	53	53	< 1	Negligible Adverse	Minor
7	54	54	< 1	Negligible Adverse	Minor
8	66	66	< 1	Negligible Adverse	Minor

7.6.15 The results show that the increase in daytime sound levels when comparing between the with vs without development scenarios for the year of development completion (2030) varies between 0.0 dBA and 0.7 dBA. Based on guidance provided within TAN 2011, this equates to a negligible adverse impact.

7.6.16 The existing properties at which the greatest increase in noise levels are predicted are located on Balloch Road (NSR 06, 07, 08) refer to **Figure 7-2** in **Appendix 7.2**). This is due to the current traffic flows increasing due to development generated traffic. Based on residential dwellings having a high sensitivity and the impact being negligible adverse, this equates to a minor effect, which is not considered to be significant.

Comparison of Night-Time Predicted Sound Levels

7.6.17 Night-time sound levels at the façades of existing residential dwellings have been compared with and without development traffic. The results are provided in **Table 7-17**.

Table 7-17: Comparative Night-Time Noise Levels, With and Without Development.

Noise Sensitive Receptor ID	2030 Without Proposed Development $L_{Aeq, 16hour}$ dB	2030 With Proposed Development $L_{Aeq, 16hour}$ dB	Difference dB	Tan 2011 Magnitude of Impact	TAN 2011 Level of Significance
1	54	54	<1	Negligible Adverse	Minor
2	46	46	<1	Negligible Adverse	Minor
3	44	44	<1	Negligible Adverse	Minor

Noise Sensitive Receptor ID	2030 Without Proposed Development $L_{Aeq, 16hour}$ dB	2030 With Proposed Development $L_{Aeq, 16hour}$ dB	Difference dB	Tan 2011 Magnitude of Impact	TAN 2011 Level of Significance
4	46	46	<1	Negligible Adverse	Minor
5	52	52	<1	Negligible Adverse	Minor
6	46	45	<1	Negligible Adverse	Minor
7	47	47	<1	Negligible Adverse	Minor
8	58	58	<1	Negligible Adverse	Minor

7.6.18 The results show that the increase in night-time sound levels when comparing between the with vs without development scenarios for the year of development completion (2030) varies between 0.0 dBA and 0.7 dBA. Based on guidance provided within TAN 2011, this equates to a negligible adverse impact.

7.6.19 The existing properties at which the greatest increase in noise levels are predicted are located on Balloch Road (NSR 06, 07, 08) refer to **Figure 7-2** in **Appendix 7.2**). This is due to the current traffic flows increasing due to development generated traffic. Based on residential dwellings having a high sensitivity and the impact being negligible adverse, this equates to a minor effect, which is not considered to be significant.

Daytime Sound Levels at Proposed Resort Accommodation

7.6.20 To assess the impact of road traffic on the proposed sensitive receptors within the Proposed Development, sound levels across the development have been assessed based on development traffic flows and are presented in **Table 7.18**. The design and mitigation features of the Proposed Development, outlined in section 3.11 have been incorporated into the acoustic model.

Table 7-18: Sound Levels at Proposed Sensitive Receptors

Noise Sensitive Receptor ID	Modelled Daytime $L_{Aeq,16hour}$ dB	Meets External Noise Criteria. Target = 55 dB $L_{Aeq,16hour}$?	Excess dB	TAN 2011 Magnitude of Impact	TAN 2011 Level of Significance
9	57	No	2.3	Negligible Adverse	Minor/Moderate
10	52	Yes	-	No Change	Negligible or No Effect
11	60	No	5.4	Minor Adverse	Moderate/Major
12	52	Yes	-	No Change	Negligible or No Effect
13	49	Yes	-	No Change	Negligible or No Effect
14	46	Yes	-	No Change	Negligible or No Effect
15	45	Yes	-	No Change	Negligible or No Effect

7.6.21 The above noise receptors were chosen as they are considered to be the most exposed to noise from road traffic on the A82 and the local road network. The results show that the external noise levels at the majority of these properties, are predicted to be within the target external noise criteria of 55dBA. Noise levels at the most exposed proposed properties exceed the noise target between 0.0dB(A) at NSR 21 to 2.9dB(A) at NSR 29. An exceedance of less that 3dB(A) is considered as a negligible adverse impact based on TAN 2011 guidance. Based on the impact being negligible adverse, and the sensitivity of residential dwellings being high, the effect of the daytime noise is minor, which is not considered to be significant.

7.6.22 As the noise is acceptable at these, the most exposed properties; it shall also be at other, less exposed parts of the development. The external daytime noise is therefore considered acceptable at the proposed development site and does not need to be reduced further.

Night-Time Noise Impact at Proposed Resort Accommodation

7.6.23 To assess the impact of road traffic on the proposed sensitive receptors within the Proposed Development, sound levels across the development have been assessed based on traffic flows inclusive of development traffic. The design and mitigation features of the proposed development, outlined in section 3.11, have been incorporated into the acoustic model. Night-time sound levels have been modelled at a height of 4 m above ground level and are presented in **Table 7-19**.

7.6.24 Based on noise intrusion through standard thermal double glazing, internal sound levels within bedrooms due to noise ingress are typically 30 dB below external sound levels with closed windows. Based on this, the calculated internal night-time average sound level is also presented in **Table 7-19**.

Table 7-19: Sound Levels at Proposed Sensitive Receptors

Noise Sensitive Receptor ID	Modelled Night-Time $L_{Aeq,8hour}$ d	Calculated Internal $L_{Aeq,8hour}$ dB
9	50	20
10	45	15
11	53	23
12	44	14
13	42	12
14	39	9
15	40	10

7.6.25 According to these results, night-time internal sound levels at the proposed properties around the periphery of proposed development; those most exposed to the main noise sources (i.e. A82, Old Luss Road, Ben Lomond Way, Pier Road and Balloch Road) are predicted to meet the guidance noise criteria of 30dBA within bedrooms during the night-time periods with closed windows.

7.7 Further Mitigation and Enhancement

Construction Phase

7.7.1 As stated in Section 7.6, construction phase impacts have been scoped out of this assessment.

7.7.2 A Construction Environmental Management Plan (CEMP) will be prepared prior to construction. Further mitigation is not expected.

Operational Phase

7.7.3 The level of significance of noise impact within the current masterplan is minor. The design mitigation features incorporated into the final masterplan design is of one stretch of 2m high close boarded timber garden fencing at the garden /terrace boundary of NSR 11.

7.7.4 Taking account of proposed mitigation and enhancement measures, the residual potential effects from the construction and operation of the proposed development are identified below.

7.8 Residual Effects

Construction Phase

7.8.1 As stated in Section 7.6, construction phase impacts have been scoped out of this assessment. A Construction Environmental Management Plan (CEMP) will be prepared prior to construction. Noise and vibration suppression techniques will be included in the CEMP and it is therefore considered that significant adverse impacts from construction noise and vibration would not occur.

Operational Phase

7.8.2 The embedded mitigation of a 2 m barrier at NSR 11 reduces the sound level at that NSR. The level of significance based on TAN 2011 is moderate/major. This calculation of amenity area has been made from the façade directly facing the A 82.

7.8.3 If the amenity of area of NSR 11 were to be designed to built on the eastern side of the lodge, the lodge itself would serve as a barrier to sound, and therefore reducing the sound level.

7.8.4 This reduction would most likely change the impact significance from moderate/major to moderate in accordance with TAN 2011.

7.8.5 No other residual effects have been identified.

7.9 Monitoring

7.9.1 In the absence of any likely significant adverse effects, no monitoring is considered to be proportionate or required.

7.10 Cumulative Effects

7.10.1 Cumulative effects can occur when other proposed developments would also be relevant to the setting of a sensitive receptors. There are no other proposed developments to which these criteria apply, and therefore cumulative effects have been scoped out of this assessment.

7.11 Summary

7.11.1 A noise assessment has been carried out to assess the impact of the increase in traffic noise as a result of a proposed development at Lomond Banks in Balloch.

7.11.2 The impact of road traffic noise on both existing and proposed residential receptors has been assessed against noise criteria agreed with West Dunbartonshire Council.

7.11.3 3D computer noise modelling using Soundplan v8.2 software has been carried out and validated against measured on-site road traffic noise data. The modelling considered current year (**2019**), and year of development completion (**2030**) scenarios. Vibration was scoped out of the assessment because it is considered not to be an issue.

7.12 References

- Her Majesties Stationary Office (HMSO) (1974). The Control of Pollution Act 1974.
- Her Majesties Stationary Office (HMSO) (1990). Environmental Protection Act 1990 (as amended).
- Loch Lomond & The Trossachs National Park (2017). Local Development Plan.
- The Scottish Government (2014b). Scottish Planning Policy.
- The Scottish Government (2014a). Scotland's Third National Planning Framework.
- The Scottish Government Local Government and Communities Directorate (2011a). PAN 1/2011 Planning and Noise. The Scottish Government.
- Environment and Forestry Directorate, The Scottish Government (EFD) (2011b). Assessment of Noise: Technical Advice Note.
- Department of Transport. Calculation of Road Traffic Noise, HMSO, London, 1988, ISBN 0-11-550847-3.
- World Health Organisation (1999). Guidelines For Community Noise. Geneva: WHO.
- World Health Organisation (WHO) (2018). Environmental Noise Guidelines for the European Region.
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- British Standards Institute (BSI) (2003). British Standard 7445: Part 1:2003 Description and Measurement of Environmental Noise. Guide to Quantities and Procedures.
- British Standards Institute (BSI) (2014a). 5228-1:2009+A1:2014 Code of Practice for Noise and Vibration Control on Construction and Open Sites – Part 1: Noise.
- British Standards Institute (BSI) (2014b). 5228-1:2009+A1:2014 Code of Practice for Noise and Vibration Control on Construction and Open Sites – Part 2: Vibration.
- British Standards Institute (BSI) (2019). British Standard 4142:2014 +A1:2019 Methods for Rating and Assessing Industrial and Commercial Sound.
- Standards for Highways (2020). Design Manual for Roads and Bridges, LA 111, Noise and Vibration Revision 2.
- Institute of Acoustics (IOA), Chartered Institute of Environmental Health (CIEH) and Association of Noise Consultants (ANC) (2017). Professional Practice Guidance on Planning and Noise.

8 Air Quality

8.1 Introduction

8.1.1 This chapter of the EIAR provides an assessment of the likely significant effects from the proposed development on local air quality. The assessment is based on the characteristics of the site and surrounding area and the key parameters of the proposed development detailed in **Chapter 2 – Site and Proposed Development**.

8.1.2 This chapter has been prepared by Stantec, in line with best practice, a statement outlining the relevant expertise and qualifications of competent experts appointed to prepare this EIAR is provided in **Appendix 1.1**.

8.1.3 The aims of this chapter are to:

- Identify the relevant context in which the air quality assessment has been undertaken;
- Describe the methods used to undertake the assessment;
- Outline the relevant baseline conditions currently existing at the site and surroundings;
- Identify the likely direct and indirect air quality effects of the proposed development under the future baseline scenario;
- Identify mitigation and enhancement measures where required to address likely effects;
- Assess likely residual effects; and,
- Assess likely cumulative effects on air quality from the proposed development in combination with other relevant cumulative developments.

8.1.4 This chapter is supported by **Appendix 8.1 – EPUK IAQM Guidance (2017) Screening Criteria**.

8.2 Policy Context, Legislation, Guidance and Standards

Legislation

8.2.1 The overarching legislative framework applicable to this EIA for the proposed development is outlined in **Chapter 4 – Legislative and Policy Context**. Subject specific legislation of relevance to this assessment are detailed in the section below.

Air Quality Regulations

8.2.2 The Air Quality (Scotland) Regulations 2000 (AQR) defined Air Quality Objectives (AQOs, a combination of concentration-based thresholds, averaging periods and compliance dates) for a limited range of pollutants. Subsequent amendments were made to the AQR in 2001 and 2002 to incorporate 'limit values' and 'target values' for a wider range of pollutants as defined in European Union (EU) Directives.

8.2.3 These amendments were consolidated by the Air Quality Standards (Scotland) Regulations 2010 (AQSR) (with subsequent amendments most notably in 2016 and for the devolved administrations), which transposed the EU's Directive on ambient air quality and cleaner air for Europe (2008/50/EC).

8.2.4 Following the Transition Period after the UK's departure from the EU in January 2020, the Air Quality (Amendment of Domestic Regulations) (EU Exit) Regulations 2019 (and subsequent amendments for the devolved administrations) have amended the AQ Standards Regulations 2010 to reflect the fact that the UK has left the EU, but do not change the pollutants assessed or the numerical thresholds.

8.2.5 The relevant AQOs for this assessment are shown in **Table 8-1.**

Table 8-1: Relevant Air Quality Objectives

Pollutant	Time Period	AQOs
Nitrous Dioxide NO_2	1-hour mean	200 µg/m^3 not to be exceeded more than 18 times a year
	Annual mean	40 µg/m^3
Particulate Matter PM_{10}	24-hour mean	50 µg/m^3 not to be exceeded more than 7 times a year
	Annual mean	18 µg/m^3
Particulate Matter $PM_{2.5}$	Annual mean	10 µg/m^3

National Air Pollution Plan for NO_2 in the UK

8.2.6 The National Air Quality Plan for NO_2 (DEFRA, 2018) sets out how the Government plans to deliver reductions in NO_2 throughout the UK, with a focus on reducing concentrations to below the EU Limit Values throughout the UK within the 'shortest possible time'.

8.2.7 The plan requires all LAs in Scotland which DEFRA identified as having exceedances of the Limit Values in their areas past 2020 to develop local plans to improve air quality and identify measures to deliver reduced emissions, with the aim of meeting the Limit Values within their area within "*the shortest time possible*". Potential measures include changing road layouts, encouraging public and private ultra-low emission vehicle (ULEV) uptake, the use of retrofitting technologies and new fuels and encouraging public transport. In cases where these measures are not sufficient to bring about the required change within 'the shortest time possible' then LAs may consider implementing access restrictions on more polluting vehicles (e.g. Clean Air Zones (CAZs)).

Air Quality Management

The Air Quality Strategy

8.2.8 Part IV of the Environment Act 1995 (Environment Act, 1995) required the Secretary of State to prepare and publish and 'strategy' regarding air quality.

8.2.9 The Air Quality Strategy (2007) establishes the policy framework for ambient air quality management and assessment in the UK (DEFRA, 2007). The primary objective of the Air Quality Strategy is to ensure that everyone can enjoy a level of ambient air quality which poses no significant risk to health or quality of life. The Air Quality Strategy sets out the AQOs and Government policy on achieving these.

8.2.10 The Clean Air for Scotland 2 Strategy (The Scottish Government, 2021) sets out how the Scottish Government will deliver air quality improvements over the next 5 years. The strategy aims to lower emissions of pollutants in Scotland, thereby minimising human exposure to harmful concentrations of pollution.

Local Air Quality Management

8.2.11 Part IV of the Environment Act 1995 (Environment Act, 1995) introduced a system of Local Air Quality Management (LAQM) which requires local authorities to regularly and systematically review and assess air quality within their boundary and appraise development and transport plans against these assessments.

8.2.12 Where a AQO is unlikely to be met, the local authority must designate an Air Quality Management Area (AQMA) and draw up an Air Quality Action Plan (AQAP) setting out the measures it intends to introduce in pursuit of the AQO's within its AQMA.

8.2.13 The Local Air Quality Management: Policy Guidance (The Scottish Government, 2018) provides guidance intended to help local authorities with their local air quality management duties. This guidance also makes reference to the Local Air Quality Management Technical Guidance 2016 (LAQM.TG (16); DEFRA, 2021) as an accompanying guidance document. LAQM.TG (16) provides advice as to where the AQOs apply. These include outdoor locations where members of the public are likely to be regularly present for the averaging period of the objective (which vary from 15 minutes to a year) as summarised in **Table 8-2.**

Table 8-2: Relevant Public Exposure

Averaging Period	AQOs should Apply at:	AQOs Don't Apply at:
Annual mean	All locations where members of the public might be regularly exposed For example: ▪ Building façades of residential properties, schools, hospitals, care homes etc.	Façades of offices or other places of work where members of the public do not have regular access Hotels, unless people live there as their permanent residence Gardens of residences Kerbside sites Any other location where public exposure is expected to be short term
24-hour mean and 8-hour mean	All locations where the annual mean AQO would apply, together with hotels and gardens of residences	Kerbside sites Any other location where public exposure is expected to be short term
1-hour mean	All locations where the annual mean and 24 and 8-hour mean AQOs apply as well as: ▪ Kerbside sites; ▪ Those parts of car parks, bus stations and railway stations etc. which are not fully enclosed, where members of the public might reasonably be expected to spend one hour or more; and, ▪ Any outdoor locations where members of the public might reasonably be expected to spend one hour or longer.	Kerbside locations where the public would not be expected to have regular access
15-minute mean	All locations where members of the public might reasonably be regularly exposed for a period of 15 minutes or longer.	

Policy

8.2.14 The planning policy framework applicable to this EIA for the proposed development is outlined in **Chapter 4 – Legislative and Policy Context**. The statutory Development Plan applicable to the site presently comprises:

8.2.15 Planning policy considerations of specific relevance to this assessment are:

- Scottish Planning Policy (2014);
- Planning Advice Note 51 Planning Environmental Protection and Regulation (Revised October 2006);
- Planning Advice Note 75: Planning for Transport;
- Cleaner Air for Scotland 2 – Towards a Better Place for Everyone;
- Adopted West Dunbartonshire Local Plan (2010) – Policy GD 1 – Development Control;
- West Dunbartonshire LDP Proposed Plan 2016 – Policy DS4 – Air Quality; and,
- West Dunbartonshire LDP2 Proposed Plan (2020) – Policy ENV8 – Air, Light and Noise Pollution.

Guidance and Relevant Technical Standards

8.2.16 The following guidance and technical standards have informed this assessment:

- The Local Air Quality Management: Policy Guidance;
- Defra 'Local Air Quality Management Technical Guidance (LAQM.TG (16))'; and,
- EPUK-IAQM 'Land-Use Planning & Development Control: Planning for Air Quality.

8.3 Methodology

Overview

Assessment Scope

8.3.1 The principal aspects considered within this assessment are:

- Existing air quality within the study area; and,
- Operational road traffic effects of the proposed development on local air quality.

8.3.2 This chapter presents an assessment of likely significant effects on air quality from the proposed development. The assessment has been prepared in accordance with the EIA Regulations.

8.3.3 In accordance with the EIA Scoping Report and subsequent EIA Scoping Opinion provided in **Appendix 3.1**, the following potential effects have been scoped out of detailed consideration within the assessment:

- Construction phase effects on dust and elevated PM_{10} concentrations

Assessment Process

8.3.4 In undertaking the assessment presented in this ES chapter, the following activities have been carried out:

- EIA Scoping and consultation (see below);
- Desktop review of current and expected future baseline environmental conditions at the site and surrounding area;
- Assessment of likely operational air quality effects; and,
- Identification and assessment of residual likely significant effects, considering proposed mitigation and enhancement measures and including consideration of likely cumulative effects.

Consultation

EIA Screening and Scoping

8.3.5 This assessment has been informed by an EIA Scoping Report prepared by Stantec in June 2021 and the subsequent EIA Scoping Opinion issued by LLTNPA in July 2021 in respect of the EIA for the proposed development. The EIA Scoping Opinion is provided in **Appendix 3.1**.

Post Scoping Consultation

8.3.6 No post scoping consultation has been carried out.

Study Area

8.3.7 The Study Area adopted for this assessment is:

- All roads within 250m of the site and any other roads predicted to experience an increase of greater than 500 vehicles per day as a result of the proposed development.

Information Sources

Desk Top Study

8.3.8 Information on existing air quality has been obtained by collating the results of monitoring carried out by WDC. Background concentrations for the site have been defined using the national pollution maps published by Defra. These cover the whole country on a 1x1 km grid (Defra, 2018).

Approach to Assessment

8.3.9 The potential for impacts as a result of emissions from traffic associated with the proposed development is determined based on the screening criteria outlined in the EPUK / IAQM Guidance (EPUK / IAQM 2017) (see **Appendix 8.1)** which includes consideration of the volume and composition of traffic associated with the proposed development and existing local air quality conditions (i.e. the presence of any declared AQMAs).

8.3.10 The criteria defined in the IAQM guidance are precautionary and should be treated as indicative, the guidance states:

'They are intended to function as a sensitive 'trigger' for initiating an assessment in cases where there is a possibility of significant effects arising on local air quality. This possibility will, self-evidently, not be realised in many cases. The criteria should not be applied rigidly; in some instances, it may be appropriate to amend them on the basis of professional judgement, bearing in mind that the objective is to identify situations where there is a possibility of a significant effect on local air quality.'

8.3.11 Therefore, the application of these thresholds requires consideration of baseline air quality, location of receptors and future trends in emissions to conclude whether there is a risk of significant effects.

8.3.12 Information on the trip generation associated with the proposed development has been provided by the Project's transport consultants, Stantec.

8.4 Baseline

Ambient Air Quality

LAQM

8.4.1 WDC has investigated air quality within its area as part of its responsibilities under the LAQM regime. Currently, WDC has not declared any Air Quality Management Areas (AQMA) within the authority.

Local Monitoring Data

NO_2

8.4.2 WDC operates two automatic monitoring stations within its administrative boundary. The nearest automatic monitor is located approximately 7 km from the Site at Glasgow Road, Dumbarton. WDC also undertakes monitoring using NO_2 diffusion tubes at 35 sites. The closest diffusion tube monitoring to the Site, DT21, is located approximately 700m south of the Site on A811 within Balloch. These two monitoring sites are described in **Table 8-3 to Table 8-4.**

Table 8-3: Measured Annual Mean NO_2 Concentrations 2016 – 2019

Site ID	Location	Site Type	Annual Mean (µg/m^3)			
			2016	2017	2018	2019
Automatic Monitor						
CM2	Glasgow Road, West Dunbartonshire	Roadside	21	20	18	18
Diffusion Tube						
DT21	Balloch 1	Kerbside	19.6	22.8	18.0	20.1

Data from 2020 Air Quality Annual Progress Report for West Dunbartonshire Council (WDC 2020)

8.4.3 The measured concentrations were all well below the annual mean NO_2 AQO between 2016 – 2019 at all monitoring locations.

Table 8-4: Measured Exceedances of the Hourly Mean NO_2 AQO 2016 – 2019

Site ID	Number of Hours >200µg/m^3			
	2016	2017	2018	2019
CM2 Glasgow Road, West Dunbartonshire	0	0	0	0

Data from 2020 Air Quality Annual Progress Report for West Dunbartonshire Council (WDC 2020)

8.4.4 **Table 8-4** shows that there have been no exceedances of the hourly mean NO_2 AQO between 2016 – 2019.

PM_{10} and $PM_{2.5}$

8.4.5 WDC does not carry out any monitoring of PM_{10} or $PM_{2.5}$ near the site.

Predicted Background Concentrations

8.4.6 Estimated background concentrations for the Site have been obtained from the Scottish Air Quality Maps (Scottish Government & Ricardo Energy & Environment, 2021) and are provided in **Table 8-5.** The background concentrations are all well below the relevant AQOs.

Table 8-5: Estimated Annual Mean Background Concentrations

Year	Location	Annual Mean (µg/m^3)		
		NO_2	PM_{10}	$PM_{2.5}$
2022	238_682	4.0	7.2	4.4
AQO		**40**	**18**	**10**

Note: Projections in the 2018 reference year background maps and associated tools are based on assumptions which were current before the Covid-19 outbreak in the UK. In consequence these tools do not reflect short- or longer-term impacts on emissions in 2020 and beyond resulting from behavioural change during the national or local lockdowns.

8.5 Embedded Mitigation

8.5.1 As detailed in **Chapter 2 – Site and Proposed Development**, several design features and embedded mitigation measures have been incorporated into the design of the proposed development to avoid, prevent, or minimise significant adverse environmental effects and to enhance beneficial effects. Embedded mitigation measures of relevance to this assessment are:

8.5.2 Travel Plan to promote sustainable travel choices by staff and visitors to the site. This will reduce the number of single-occupancy car journeys made to and from the site.

8.6 Assessment of Likely Effects

Operational Phase

Road Traffic Emissions

8.6.1 Data derived from the Transport Assessment indicates that the vehicular trip generation due to the proposed development is predicted to be 1,433 per day. Traffic flows associated with the proposed development are predicted to exceed 500 AADT on the A811, Balloch Road and Ben Lomond Way, however

8.6.2 These screening criteria are precautionary and are defined at thresholds that are unlikely to lead to an impact in excess of 1% of the annual average air quality objectives, i.e. traffic flows below 500 AADT are unlikely to result in annual average NO_2 impacts greater than 0.4 µg/m^3.

8.6.3 There are no residential receptors located on the A811 or Ben Lomond Way and those located on Balloch Road are set back from the road.

8.6.4 Therefore, given the likely traffic flows, the limited residential receptors along the roads experiencing an increase greater than 500 AADT, and the very low background concentrations there is not considered to be a risk of significant air quality impacts due to traffic associated with the proposed development and no further assessment is considered necessary.

Site Suitability

8.6.5 The NO_2 concentrations at the local monitoring sites are well below the objective at all locations in 2019. Measured concentrations are well below 60 µg/m^3, indicating that the one-hour mean NO_2 objective is unlikely to be exceeded within the site. PM_{10} and $PM_{2.5}$ are also expected to be well below the objectives. Background concentrations of NO_2, PM_{10} and $PM_{2.5}$ are well below the annual mean of AQO and the Site is considered suitable for the proposed use.

8.7 Further Mitigation and Enhancement

Operational Phase

Road Traffic Emissions

8.7.1 No further mitigation measures are required.

Site Suitability

8.7.2 The Site is considered suitable without the need for site-specific mitigation associated with air quality.

8.8 Residual Effects

8.8.1 The operational phase residual effects are negligible.

8.9 Monitoring

8.9.1 In the absence of any likely significant adverse effects, no monitoring is considered to be proportionate or required.

8.10 Cumulative Effects

8.10.1 None of the relevant cumulative developments are likely to result in significant cumulative transport effects in combination with the proposed development. The cumulative effect of traffic on air quality is not likely to be significant.

8.11 Summary

8.11.1 The air quality effects associated with the operational phase of the proposed development have been assessed. The assessment was undertaken in accordance with guidance from the Institute of Air Quality Management (IAQM) and national and local policy.

8.11.2 The chapter described the existing baseline air quality and assessed the impact of the operation of the development on local air quality. The main air pollutants of concern for road traffic are nitrogen dioxide (NO_2) and particulate matter (PM_{10} and $PM_{2.5}$).

8.11.3 The site does lie not within an Air Quality Management Area (AQMA). Measured NO_2 concentrations at monitoring locations representative of the site have been well below the annual mean objective between 2016 and 2019. Background concentrations for the site are also well below the objectives for NO_2 and particulates (PM_{10} and $PM_{2.5}$).

8.11.4 The increase in traffic because of the development has been compared against criteria contained within the IAQM guidance on land use planning and development control. Given the limited residential receptors along the roads experiencing an increase greater than 500 AADT, and the very low background concentrations, the effect of road traffic emissions on human health is therefore not significant and no further direct mitigation is required. Notwithstanding this, a Travel Plan will be developed and implemented during the operational phase of the proposed development to promote sustainable travel choices by staff and visitors to the site. This will reduce the number of single-occupancy car journeys made to and from the site.

8.11.5 Overall, the operational air quality effects of the proposed development are judged to be not significant.

8.12 References

- Department of the Environment, Food and Rural Affairs (DEFRA) (2018). '*UK Plan for tackling Roadside Nitrogen Dioxide Concentrations: Detailed Plan'.* Available at: https://www.gov.uk/government/publications/air-quality-plan-for-nitrogen-dioxide-no2-in-uk-2017.
- Department of the Environment, Food and Rural Affairs (DEFRA) in partnership with the Scottish Executive, The National Assembly for Wales and the Department of the Environment for Northern Ireland (2007). '*The Air Quality Strategy for England, Scotland, Wales, Northern Ireland'* HMSO, London.
- Department for Transport (2018). '*The Road to Zero'*. Available at: https://www.gov.uk/government/publications/reducing-emissions-from-road-transport-road-to-zero-strategy.

- Department of the Environment, Food and Rural Affairs (DEFRA) (2019). '*Clean Air Strategy 2019*'.
- Department of the Environment, Food and Rural Affairs (DEFRA) (2021). '*Local Air Quality Management Technical Guidance (TG16)*'. April 2021.
- Directive 2008/50/EC of the European Parliament and of the Council of 21 May 2008 on ambient air quality and cleaner air for Europe.
- Environment Act 1995, Part IV.
- Environmental Protection UK and the Institute of Air Quality Management (EPUK / IAQM) (2017). '*Land-use Planning & Development Control: Planning for Air Quality*'. V1.2. The Institute for Air Quality Management, London.
- Scottish Government, 2014, "*Scottish Planning Policy*"
- Scottish Government (2015) Cleaner Air for Scotland - The Road to a Healthier Future http://www.gov.scot/Publications/2015/11/5671
- Statutory Instrument 2000, No 921, '*The Air Quality (Scotland) Regulations 2000'* HMSO, London.
- Statutory Instrument 2002, No 3034, '*The Air Quality (Scotland) (Amendment) Regulations 2002'* HMSO, London.
- Statutory Instrument 2010, No. 1001, '*The Air Quality Standards Regulations 2010'* HMSO, London.
- Statutory Instrument 2016, No. 1184, '*The Air Quality Standards (Amendment) Regulations 2016*' HMSO, London.
- The Scottish Executive, 2006, '*Planning Advice Note 51: Planning, Environmental Protection and Regulation*'.
- The Scottish Executive, '*Planning Advice Note 75: Planning for Transport*'.
- West Dunbartonshire Council (2020) 2020 Air Quality Annual Progress Report for West Dunbartonshire Council June 2020.

9 Ground Conditions

9.1 Introduction

9.1.1 This chapter of the EIAR provides an assessment of the likely significant effects from the proposed development on ground conditions. It also assesses the effects from the ground conditions such as potential contamination on the proposed development. The assessment is based on the characteristics of the site and surrounding area and the key parameters of the proposed development detailed in **Chapter 2** of the EIA Report.

9.1.2 This chapter has been prepared by Stantec, in line with best practice, a statement outlining the relevant expertise and qualifications of competent experts appointed to prepare this EIA Report is provided in **Appendix 1.1.**

9.1.3 This chapter is supported by the following figures and technical reports provided in **Appendix 9**:

- **Appendix 9.1 – Figures** includes:
  - **Figure 9-1 Composite Plan of Shallow Ground Conditions**. This has been reproduced from the 2017 Ground Investigation Report and does not reflect changes to the Site boundary; and,
  - **Figure 9-2 Site Investigation Locations where Contamination was Encountered and Ground Gas Characteristic Situations**. This has been reproduced from the 2017 Ground Investigation Report and does not reflect changes to the Site boundary.
  - **Appendix 9.2 – Preliminary Phase 2 Ground Condition Assessment**

9.2 Policy Context, Legislation, Guidance and Standards

Legislation

9.2.1 The overarching legislative framework applicable to this EIA for the proposed development is outlined in **Chapter 4 – Legislation and Planning Policy Context**. Over and above this the following statutory provisions are of specific relevance to this assessment.

- Environmental Protection Act 1990 (Part IIA) (as amended);
- Environment Act 1995 (Section 57);
- The Contaminated Land (Scotland) Regulations 2000 (as amended);
- Water Environment and Water Services (Scotland) Act 2003 which implemented the Water
- Framework Directive 2000/60/EC (“the WFD”); and,
- The Water Environment (Controlled Activities) (Scotland) Regulations 2011 (as amended) which implements the Groundwater Directive 2006/118/EC (a daughter directive to the WFD).

Policy

9.2.2 The planning policy framework applicable to this EIA for the proposed development is outlined in **Chapter 4**. The statutory Development Plan applicable to the Site presently comprises:

9.2.3 Planning policy considerations of specific relevance to this assessment are:

9.2.4 Loch Lomond and the Trossachs Local Development Plan 2017-2021 (LLTNP, 2017), in particular:

- Natural Environment Policy 11: Protecting the Water Environment; and,
- Natural Environment Policy 16: Land Contamination.
- Scottish Planning Policy (2020), in particular the following relevant provisions:
  - Principal Policy on Sustainability (paragraphs 24-35);

- Principal Policy on Placemaking (paragraphs 36-57); and,
- National Planning Framework 3 (NPF3) (2014).

Guidance and Relevant Technical Standards

9.2.5 The following guidance and technical standards have informed this assessment:

- Land Contamination Risk Management (LCRM) (EA, 2021) which is based on the now withdrawn Contaminated Land Report (CLR) 11: Model Procedures for the Management of Contamination (EA, 2004). It is noted that CLR11 was used to guide the investigation of the Site reported in 2017, and that the essential principles of CLR11 and LC:RM with respect to the assessment of contaminated land risk and remediation are closely aligned;
- BS 5930:2015 Code of practice for ground investigations (note that this guidance has been updated since the 2017 assessment took place);
- BS 10175:2011 Investigation of potentially contaminated sites – Code of practice (note that this guidance has been updated since the 2017 assessment took place);
- BS 8485:2015 Code of practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings (note that this guidance has been updated since the 2017 assessment took place);
- Scottish Government Planning Advice Note (PAN) 33 Development of Contaminated land (Scottish Government, 2017);
- Position Statement (WAT-PS-10-01) Assigning Groundwater Assessment Criteria for Pollutant Inputs v3.0 (note that this guidance has been updated since the 2017 assessment took place);
- Supporting Guidance (WAT-SG-53) Environmental Quality Standards and Standards for Discharges to Surface Waters v7;
- Department of the Environment (DOE) Industry Profiles;
- Environmental Protection Act 1990: Part 2A Contaminated Land Statutory Guidance, Second Edition; and,
- SEPA Guidance for Pollution Prevention (GPPs) including GPP 2 above ground oil storage tanks, GPP 5 works and maintenance in or near water, GPP 8 safe storage and disposal of used oils, GPP 21 pollution incident response planning, GPP 22 dealing with spills and PPG 26 safe storage – drums and intermediate bulk containers. All GGPs and the older PPGs are available at NetRegs (2022).

9.3 Methodology

Overview

Assessment Scope

9.3.1 The principal aspects considered within this assessment are:

- Human health – construction workers, future site users and maintenance workers and neighbours;
- Water environmental – River Leven, Loch Lomond and the superficial and bedrock groundwaters;
- Ecological systems – although no statutory designated sites are onsite or within 250m, Balloch Country Park (non-statutory) country park is within 250m of the Site;
- Property – pastural and arable land within 250m west;
- Property (structures and utilities) – utilities including the INEOS High Pressure Oil Pipeline and other gas apparatus are known to be present below the surface of the Site; and,
- Archaeological sites and ancient monuments – scheduled monument within 250m of the Site boundary (located in the Balloch Castle grounds).

9.3.2 The Ground Conditions chapter presents an assessment of likely significant effects on ground conditions from the proposed development. The assessment presented in this Ground Conditions chapter has been prepared in accordance with the EIA Regulations.

9.3.3 The assessment of likely effects makes comparison with the baseline year (2017) during which time the site surveys were carried out. The 2017 investigation entailed drilling of 57 windowless sampler boreholes at representative locations across the Site to enable the assessment of soil, groundwater and ground gas characteristics. Although the investigation was described as "preliminary", the site wide coverage is considered to present an appropriate level of detail to characterise conditions. It was however noted that certain localised areas may require additional investigation once the proposed development layout had been finalised.

9.3.4 The Site has not undergone significant development or disturbance since the 2017 investigation and as such, the conditions reported at that time are considered to be representative of the current state of the environment.

9.3.5 The 2017 investigation took account of the findings of investigations undertaken by AECOM (AECOM, 2015).

9.3.6 Since the 2017 investigation, minor changes have been made to the Site boundary, in particular, the addition of an area identified as "Area D 4b and 10" **in Figure 2-1** (**Appendix 2**). The proposed development in Area D is limited in scope, comprising the upgrade of existing paths and woodland management in area 4b and delivery, storage and management facilities in area 10.

Assessment Process

9.3.7 In undertaking the assessment presented in this EIA Report chapter, the following activities have been carried out:

Consultation

EIA Screening and Scoping

9.3.8 WDC Environmental Health and SEPA were consulted by Loch Lomond and the Trossachs National Park for the EIA Scoping Opinion.

9.3.9 WDC noted that they would reserve comments on contaminated land for each area of development when planning applications are submitted. WDC noted that they have not been previously consulted on the ground investigation (GI) and may therefore comment the extent of the investigations to date. It is understood that WDC have reserved comment partially due to the original GI being labelled as 'preliminary' in the absence of a masterplan.

Post Scoping Consultation

9.3.10 The following post-scoping consultation has taken place:

- WDC responded to the Stantec EIA Scoping Report within the Loch Lomond and The Trossachs National Park Scoping Opinion dated 27/06/21;
- The response stated that WDC Environmental Health would reserve comments on the development until planning permissions were submitted;
- WDC suggested that they should be consulted ahead of further ground investigation work proposed to support the development and stated that any SI will require to be reviewed and approved, **prior to the submission** of any Remedial Strategy for review and approval;
- Stantec discussed the comments above with the Contaminated Land Officer at WDC by telephone and email on 10/08/21 and 16/08/21; and,
- It was understood that the requirement for a revised site investigation report and assessment and (if required) a Remediation Strategy will be included as planning conditions.

9.3.11 Information requests have been sent to SEPA and the Local Authority Environmental Health Department for any additional information in relation to environmental issues at the Site / surroundings.

Study Area

9.3.12 The study area for the ground conditions assessment is based on the application red line boundary shown in **Figure 2-1** ("onsite") and the surrounding area ("offsite"). The study area includes a 500m buffer zone outside of the Site boundary to consider any contaminated land effects and interactions with the Site.

9.3.13 Although the Site boundary is broadly similar to the boundary used for the 2017 investigation, there have been some minor changes. Generally, the changes comprise reductions in the area under consideration. However, there is an additional area located to the east of the Woodbank House area, labelled Zone D on the parameters plan which was not included in the 2017 investigation. This area will mostly comprise upgraded woodland paths and a staff / service area.

Information Sources

9.3.14 The following sources of information have been reviewed and used to inform the geology and ground conditions assessment:

- Riverside & Woodbank Estate, Balloch, Preliminary Phase 2 Ground Conditions Assessment, Peter Brett Associates (now Stantec), 2017 or "the 2017 ground investigation";
- Engineering Review, West Riverside, Balloch, AECOM, 2015;
- West Riverside, Loch Lomond Shores, Phase 1 Geoenvironmental Desk Study, AECOM 2015; and,
- Lomond Shores, Stage 2 Site Investigation Report, URS Report Fer 44762681/GLRP0533 Issue 2.

Approach to Assessment

9.3.15 In order to assess potential effects and identify the need for mitigation measures, Conceptual Models (CM) have been prepared for baseline, construction phase and operational phase of the development using the data identified above. Potential effects will be considered separately for each potentially complete pollutant linkage such that any potential impacts are identified and mitigated as required.

- The CM considers:
- The principal pollutant hazards (the contamination sources);
- The principal pathways between the identified hazard(s) and receptor(s); and,
- The principal receptor(s) at risk from the identified hazards, for example, people, environmental assets, surface and/or groundwater.

9.3.16 The qualitative risk is determined by the interrelationship between the potential for a source of contamination to be present, the potential for migration of the contaminant along a given pathway, and the significance of potential receptors. A pollutant linkage is identified where all three elements (source-pathway-receptor) are present.

9.3.17 The level and significance of likely effects will be judged with reference to the likelihood and the consequence of the effect occurring. The receptor sensitivity will also be taken into consideration.

Table 9-1: Criteria Used in Ground Conditions for Classifying Receptor Value or Sensitivity

Classification	Definition / Example Scenario
High Receptor of national or international importance	Human health: Residential and uses where children are present Surface water: SEPA ecological status of High or Good Groundwater: Aquifer productivity class is High or Very High Ecology: Special Areas of Conservation (SAC and candidates), Special Protection Areas (SPA and potentials) or wetlands of international importance (RAMSAR) Buildings: World Heritage Site or Conservation Area
Moderate Receptor of county or regional importance	Human health: Employment Surface water: SEPA ecological status of Moderate Groundwater: Aquifer productivity class is Moderate

Classification	Definition / Example Scenario
	Ecology: SSSI, National or Marine Nature Reserve (NNR or MNR) County Wildlife Sites (CWS) Buildings: Area of Historic Character
Low Receptor of local importance	Human health: Transient or Limited Access. Unoccupied/Industrial land use and construction workers* Surface water: SEPA ecological status of Poor or Bad Groundwater: Aquifer productivity class is Low and Very Low Ecology: Local habitat resources or no designation Buildings: Replaceable/local value

9.3.18 *assuming that construction workers will adopt appropriate health and safety and personal protective equipment (PPE) procedures

Impact Assessment Methodology

Table 9-2: Classification for Likelihood

Likelihood / Probability	Definition
High	There is a source-pathway-receptor relationship and an event either appears very likely in the short-term and almost inevitable over the long-term.
Likely	There is a source-pathway-receptor relationship, and all the elements are present and in the right place, which means that it is probable that an event will occur. Circumstances are such that an event is not inevitable, but possible in the short-term and likely over the long-term.
Low	There is a source-pathway-receptor relationship and circumstances are possible under which an event could occur. However, it is by no means certain that even over a longer period such event would take place and is less likely in the shorter- term.
Unlikely	There is a source-pathway-receptor relationship, but circumstances are such that it is improbable that an event would occur even in the very long-term.
No Likelihood	There is no source-pathway-receptor relationship present. No further consideration of risk is therefore required (i.e. the risk is scoped out from resulting in likely environmental effects and is not taken forward to the assessment matrix detailed in **Table 9-4** below.

Table 9-3: Classification for Consequence

Severity of Impact	
Severe	Acute (short term) risks to human health. Catastrophic damage to buildings / property. Major pollution of the water environment (watercourse or groundwater) or atmosphere.
Medium	Chronic (long-term) risk to human health. Pollution of the sensitive water environment (surface waters or aquifers) or atmosphere. Measurable adverse effects on sensitive ecosystems or species. Major structural damage to buildings or structures.
Mild	Pollution of non-selective waters (e.g. groundwater in non-productive strata) or atmosphere. Limited structural damage to buildings or structures.
Minor	Damage to non-selective ecosystems or species e.g. existing poor quality surface water bodies. Minor damage to buildings or structures e.g. minor cracks which do not affect structural integrity.
Negligible	Potential damage to non-selective ecosystems or species or potential damage to buildings or structures that is beneath the level of perception. No further consideration of risk is therefore required (i.e. the risk is scoped out from resulting in likely environmental effects and is not taken forward to the assessment matrix.

Assessment of Effect Level and Significance

Table 9-4: Matrix for Establishing Risk Level and Significance

		Severity			
		Severe	**Medium**	**Mild**	**Minor**
Probability	**High**	Substantial	Major	Moderate/Minor	Minor
	Likely	Major	Moderate	Minor	Negligible
	Low	Major/Moderate	Moderate/Minor	Minor	Negligible
	Unlikely	Moderate/Minor	Minor	Minor	Negligible

Limitations and Uncertainty

9.3.19 The GI undertaken in 2017 is still considered to be relevant to this Proposed Development and the coverage is largely sufficient. Limited additional investigation is recommended post PPiP Planning stage and ahead of detailed proposals, in the eastern area to delineate and better understand the elevated concentrations of contaminants encountered during the 2017 GI. Furthermore, additional investigation is recommended within the footprints of the existing / ruined buildings onsite, in particular, the footprint of the hotel building destroyed by fire may represent a potential localised source of contamination. Where structures are proposed for which specialist foundations may be required (i.e. the swimming pool and monorail stanchions etc.), additional further geotechnical investigations may be required.

9.3.20 Since the previous application, the application red line boundary has varied slightly and therefore small additional areas noted in para 9.3.6 are yet to be investigated.

9.4 Baseline

9.4.1 Baseline conditions for the proposed development have been identified using the recent 2017 ground investigation, together with the historical studies by AECOM and URS.

The Site

9.4.2 The Site is located at the northern extent of the town of Balloch, at the southern end of Loch Lomond approximately centred at Ordnance Survey Grid Reference 238666, 682128. The Site boundary is presented as **Figure 2-1**.

9.4.3 The Site measures approximately 18.9 hectares over two distinct areas known as West Riverside in the east and Woodbank House in the west.

9.4.4 A detailed description of the Site and surrounding area is provided in **Chapter 2** of this EIA Report, with a Site Location Plan provided as **Figure 2-2**.

Current Land Use

9.4.5 The larger eastern area (West Riverside) is an irregular shape and is bounded to the north by the Lomond Shores centre and the bank of the Loch itself. To the east is the River Leven (the Maid of the Loch Slipway, including pontoons) and to the south is primarily housing. The majority of the Riverside area is occupied by woodland and walking paths. Two INEOS oil pipelines run through the Site from west to east and two fenced valve compounds are present.

9.4.6 The smaller western area (Woodbank House) is accessed via a track from Old Luss Road. The majority of the Site area comprises two relatively flat lying open fields, however, in the west is an area dominated by woodland and the ruins of an old hotel and outbuildings.

9.4.7 The Site in general is relatively flat lying however in the eastern area ground levels fall away towards the River Leven. The INEOS oil pipeline runs from west to east through the northern part of the Site and for the most part is situated within a cutting. Woodland areas are hummocky, with level variations in the region of 2 to 3m. Other mounds and hollows at the Site may be related to the superficial quarrying of sands and gravels. The western part of the Woodbank

House area includes some steeply sloping ground which is thought to be a natural feature, possibly due to the effects of glacial movement

9.4.8 During the 2017 ground investigation, a belowground void was encountered in the east of the Site at borehole WS 40. It was later suggested that this void relates to a redundant 18" culvert at approximately 2m depth.

Historical Land Use

9.4.9 This summary is based on information from historical Ordnance Survey (OS) maps, which were included within the 2015 AECOM Phase 1 Desk Study.

9.4.10 The Lomond Banks site has a varied history. There is no record of heavy industrial land uses within the Riverside site, however, multiple small quarries were active, particularly in the northern and western areas. The eastern area (beside the slipway) was dominated by railway infrastructure from Balloch Station in the south to Balloch Pier in the north. A dye works was located immediately offsite to the south; however, this area is currently occupied by housing.

9.4.11 The majority of the Woodbank House area remained undeveloped from 1864 until present. The exception to this being the hotel and outbuildings present within the sloping woodland area in the west of the Woodbank House area. On later mapping the hotel was labelled as Hamilton House. The hotel building was destroyed in a fire in 1995. The majority of the building was ruined; however, the façade remains standing. The various outbuildings are in a state of severe disrepair.

Published Superficial Geology

9.4.12 The British Geological Survey (BGS) 1:50 000 scale geological map of the area, Sheet 30W and part of 29E (Scotland) - Drift "Greenock" (BGS, 1989) indicates the presence of some superficial deposits overlying the solid geology within the Site boundary. The superficial deposits comprise three main types:

- Raised Marine Deposits – Clay, silt, sand and gravel. Formed in shallow seas with mainly siliciclastic sediments. This is indicated to be present adjacent to and following the southern shoreline of the loch;
- Glaciofluvial Sand and Gravel – gravel, sand and silt formed in cold periods with Ice Age glaciers scouring the landscape and depositing moraines of till with outwash sand and gravel deposits. These deposits are indicated to be present across the greater part of the Woodbank and Riverside sites; and,
- Till (Diamicton) – these deposits were formed in cold periods with Ice Age glaciers scouring the landscape and depositing moraines of till with outwash sand and gravel deposits. These deposits are indicated to be potentially present along the western part of the Woodbank House area.

9.4.13 In addition, the BGS mapping also shows areas of man-made deposits (Made Ground) being present and these are annotated by the BGS as being "deposited on original ground surface". These occur in two locations, being; in a narrow strip along the banks of the River Leven (Slipway) to the east of Pier Road (along the alignment of the former railway line); and in an area of ground to the North of Balloch Road and extending beneath Clairnish. Furthermore, infilled ground (annotated as being manmade deposits - filling former opencast excavation) is marked as a parcel of land to the east of Old Luss Road and northwest of Ben Lomond Way, however this is believed to be outside of the Site boundary.

9.4.14 The Geology of Britain viewer on the BGS website indicates that there are also deposits of Alluvium present at the Site, described as clay, silt, sand and gravel, and shown as a ribbon extending from the shore of Loch Lomond, adjacent to the River Leven and along the alignment of the former railway line, predominantly to the east of Piers Road. These deposits may be present beneath any Made Ground.

Published Solid Geology

9.4.15 The 1:50 000 scale geological map of the area, Sheet 30W and part of 29E (Scotland) - Solid "Greenock" (BGS, 1990) indicates that the Site is entirely underlain by the Teith Sandstone Formation of the Devonian Period.

BGS Boreholes and Historical Investigations

9.4.16 There are a number of BGS Borehole records available within the boundary of the Riverside site, and the deepest of these undertaken in 1998 for Balloch Footbridge (adjacent to the northern boundary of the Site) indicates that depth to bedrock is in excess of 35m at that location.

9.4.17 The 2015 Phase 1 Desk Study summarises the ground conditions indicated by previous ground investigations carried out at the Riverside site and identifies the presence of Made Ground and 'Organic Soils' overlying 'Fluvio/Upper Glacial Deposits', 'Glacial Till' with Bedrock (sandstone) encountered at depths of between 51m below ground level (m bgl) and 69m bgl. It is considered that the descriptor 'Organic Soils' could represent Alluvium.

9.4.18 There are no BGS borehole records from within the Woodbank House area. The closest BGS records relate to a string of shallow (generally <5m) boreholes drilled along the A82, to the west of the Woodbank House area boundary. The boreholes typically reached depths of around 4.0mbgl and described 'Soft, friable or dense clayey SAND with cobbles' to around 1.5mbgl followed by 'Hard or Stiff sandy clay with boulders'

9.4.19 Two of the boreholes to the north / west of Woodbank (close to Stoneymollan Road / Roundabout) encountered sandstone bedrock at 5m – 6.5mbgl.

9.4.20 The historical boreholes indicate that the depth to bedrock may be highly variable within the area of the Riverside / Woodbank House areas. Sandstone was encountered at a depth of 52.65m at Balloch Station (southern end of Riverside), whilst in close proximity to the roundabout at the southern tip of Woodbank House area sandstone was recorded at 5.0m.

2017 Ground Investigation

9.4.21 The 2017 ground investigation comprised 57 window sample boreholes to depths of up to 5m below ground level (mbgl). However, as a result of frequent obstructions which prevented drilling progress, several attempts were made at achieving depth at many of the boreholes and as a result, the total number of boreholes attempted was 73. Borehole locations and a summary of shallow ground conditions are shown on **Figure 9-1** of **Appendix 9.1** and within the 2017 Ground Investigation report, **Appendix 9.2**. The following section summarises the ground conditions encountered in the boreholes.

Made Ground

9.4.22 Made Ground was encountered in forty-six out of seventy-three window sample boreholes, either from the ground surface or below a relatively thin layer of topsoil, to depths of between 0.15m bgl and 3.5m bgl. With the exception of WS07 on the Woodbank House area, Made Ground thicknesses in excess of 1m were encountered predominantly to the east of Pier Road (as shown on **Figures 9-1** and **9-2** of **Appendix 9.1**), where a former railway line used to cross the Site on an embankment. The borehole descriptions of the Made Ground indicate that it varies in composition from being a predominantly cohesive deposit comprising very soft gravelly sandy clay, to more typically a granular deposit, being a very loose sand and gravel or organic silty gravelly sand. Each deposit contains varying quantities of cobbles, ash, glass fragments, pottery and brick fragments.

9.4.23 A programme of geochemical laboratory testing was carried out on selected soil and groundwater samples to determine the concentrations of a range of commonly occurring potential contaminants as part of the investigation. In addition, monitoring wells installed in selected boreholes were monitored on six occasions to enable a risk assessment of potentially hazardous ground gases.

Alluvium

9.4.24 Material considered to represent Alluvium was encountered in fourteen of the seventy-three window sample boreholes, at depths between 0.2m bgl and 5.0m bgl. The Alluvium was only encountered in the eastern part of the Site, between Pier Road and the River Leven. The Alluvium was typically described as very soft and soft peaty sandy Clay, but it is noted that beds (full thickness not proven but up to at least 2.85m) of very soft and soft sandy clayey Peat were encountered, as shown on **Figure 9-1** of **Appendix 9.1** within the middle part of the Site area east of Pier Road. The Alluvium is also occasionally encountered as a very loose and loose silty Sand. An additional window sample borehole containing 2.5m thickness of peaty Sand

overlying sandy Peat was encountered at WS16 located offsite between Riverside and Woodbank.

Till (Diamicton)

9.4.25 Material considered to represent Till was encountered in five of the seventy-three window sample boreholes, all located in the western part of the Woodbank House area (**Figure 9-1** of **Appendix 9.1**). The Till was encountered at depths of between 0.1m bgl and 1.7m bgl and was typically described as a firm to stiff gravelly sandy Clay. The gravel was recorded as being flat to elongated subangular to rounded igneous rock and other lithologies. Some high value SPTs were recorded in the deposit which are considered to represent larger gravel /boulder elements present.

Glaciofluvial Deposits

9.4.26 Material considered to represent Glaciofluvial deposits was encountered in fifty-one out of seventy-three window sample boreholes, at depths from existing ground surface to 4.8m bgl. These deposits were typically encountered in the western part of the Riverside site and the eastern part of the Woodbank House area (**Figure 9-1** of **Appendix 9.1**). These deposits were typically described as medium dense Sand and Gravel, silty gravelly Sand and silty Sand, but also occasionally as gravelly sandy Clay. The gravel inclusions are described generally as elongated, sub angular to sub rounded, fine to coarse of quartz, sandstone, igneous rock and other lithologies.

Hydrogeological Setting

9.4.27 The 2015 Phase 1 Desk Study indicated that earlier ground investigations at the Site identified groundwater strikes in the 'majority of exploratory locations' and that 'groundwater at the Site was in general hydraulic continuity with the River Leven at the level between 7.54m above Ordnance Datum (AOD) and 8.89m AOD.

9.4.28 During 2017 phase of investigation, groundwater was only encountered during drilling in fourteen of the seventy-three window sample boreholes, at variable depths of between 0.8mbgl and 3.7mbgl, predominantly located in the Made Ground, Alluvium and Glaciofluvial Deposits in the east of the Site. It is noted that the surface datum level of each of the boreholes was not recorded and as such the relative level of groundwater during this phase of investigation cannot be determined. In subsequent monitoring visits, around 13 of the 36 installed boreholes remained dry.

9.4.29 The groundwater encountered is considered to be perched water, existing in pockets of more permeable strata (such as Sands and Gravels), restricted by lower permeability deposits (such as clays), rather than a continuous shallow groundwater body.

9.4.30 The SEPA Water Classification Hub indicates that both the superficial and bedrock groundwater bodies beneath the Site – the Loch Lomond and Leven Sand and Gravel groundwater (ID 150766) and Balloch groundwater (ID 150651), respectively – have both been given a status of Good by SEPA in 2020 (the latest available data).

9.4.31 The 2015 Phase 1 Desk Study stated that there were no known abstraction boreholes within 250m of the Site. Information requests have been sent to SEPA and WDC to confirm the absence of abstraction boreholes, however no response has been received at the time of writing.

Hydrological Setting

9.4.32 The nearest surface water features to the Site are Loch Lomond which is situated immediately to the north and the River Leven which is situated immediately to the east and enters the Loch adjacent to the north eastern point of the Site.

9.4.33 The SEPA Water Classification Hub indicates that Loch Lomond (ID 100257) and the River Leven (ID 10150) have both been given a status of Moderate ecological potential by SEPA in 2020 (the latest available data).

9.4.34 Information on nearby discharge consents was summarised in the Phase 1 Desk Study which includes a Landmark Envirocheck report. The only potentially extant discharge consent within the Site boundary relates to consent grated to Dumbarton District Council by SEPA to discharge

'public sewage: septic tank' into the River Leven. The consent was issued 19th January 1993. It is not known whether this is ongoing.

9.4.35 A flood risk assessment has been undertaken and is reported in this EIA Report under a separate chapter (see **Chapter 10 and Appendix 10.1**).

Other Potential Geological Hazards

9.4.36 Radon is a naturally occurring radioactive gas and emanates from geological formations to varying degrees, depending on the type, porosity and permeability. An assessment of potential for radon gas to be present is given in the 2015 Phase 1 Desk Study and indicates that the site is in the lowest category for potential radon risk. The online radon map of Scotland confirms this assessment (UK Government, 2011).

9.4.37 Based on the conclusions of the 2015 Phase 1 Desk Study and the Coal Authority website, the Site is not considered to be in an area where coal mining has occurred.

Geo-Environmental Conditions – Soil

9.4.38 The majority of the site has remained undeveloped. The main exceptions to this are the area of railway land in the east, the small superficial quarries (potentially backfilled with material of unknown origin) and the buildings associated with the hotel at the Woodbank House area. These areas are considered the main potential sources of onsite contamination.

9.4.39 **Table 9-5** below summarises the potential sources of contamination.

Table 9-5: Summary of Sources of Potential Contamination

Source	Comment
Onsite	
Railway land	Railway land is a potential source of contamination from the material used as ballast (including clinker and ashy material) as well as operational leaks and spills.
Made Ground	Made Ground or fill material of unknown origin can be a source of a range of contaminants including organic and inorganic compounds. Asbestos may be present within demolition rubble. If organic material is present, microbial decay can generate ground gases.
Peat / Organic Soils	Microbial decay can generate ground gases.
Offsite	
Dye-works	Potential for waste material from the adjacent historical dye works being deposited onsite. The dye works may have affected groundwater, subsequently migrating below the Site.

9.4.40 The following sections summarise the contamination status of soils based on the results of soil sample analysis and assessment presented in the 2017 interpretive report which is included in its entirety as **Appendix 9.2**.

9.4.41 It is noted that, in the absence of a detailed master plan for the site in 2017, the preliminary investigation used the most conservative available soil assessment criteria which are designed to be protective of human health in residential settings with private gardens.

Woodbank House

9.4.42 Despite the presence of Made Ground near the existing / ruined buildings, no potentially significant contamination was encountered in soil samples recovered from the Woodbank House area.

9.4.43 It should be noted that no investigations have been undertaken from within the building footprints.

9.4.44 Given that the main hotel building was destroyed by fire, the potential exists for limited contamination to exist in soils within the building footprint. In particular, polycyclic aromatic hydrocarbons (PAHs) are often associated with combustion. If asbestos containing materials were present in any of the structures onsite, the potential exists for asbestos to be present in structures or rubble that currently remain onsite.

9.4.45 It is understood that the remnants of the hotel will be retained and developed into holiday apartments. Additional ground investigation locations are likely to be required within the existing / ruined building footprints to confirm the ground conditions in this area.

West Riverside

9.4.46 No potentially significant contamination was encountered within soil samples recovered from the natural soils to the west of Pier Road or South of Ben Lomond Way.

East of Pier Road / West of River Leven / North of Ben Lomond Way

9.4.47 Elevated concentrations of heavy metals (lead and less frequently, arsenic and hexavalent chromium) were encountered within Made Ground soils to the east of Pier Road and North of Ben Lomond Way. These are likely to be associated with the former railway land and activities and potentially linked to the offsite dye works.

9.4.48 Concentrations of lead ranged from a maximum of 5,100mg/kg (in WS47) to a minimum of 5.1mg/kg. The average concentration of lead was 268mg/kg. The most conservative assessment criteria for lead is 200mg/kg which is the Category 4 Screening Value (C4SL) for soils in a residential garden scenario (the most conservative criterion). Fourteen soil samples contained concentrations of lead above the C4SL of 200mg/kg. The 14 locations, together with the lead concentrations are included on **Figure 9-2** of **Appendix 9.1**.

9.4.49 With the exception of WS46 (which is in close proximity to Pier Road), all of the potentially elevated concentrations of lead were located in Made Ground to the East of Pier Road and north of Ben Lomond Way.

9.4.50 A single soil sample contained a concentration of arsenic that was above the threshold for residential garden soil (65mg/kg arsenic in WS38). This location is indicated on **Figure 9-2** of **Appendix 9.1**. A single soil sample contained a concentration of hexavalent chromium that was above the threshold for C4SL for soils in a residential garden scenario (8mg/kg hexavalent chromium in WS49). The elevated chromium concentrations correspond approximately with an area that driller noted some green colouration in soils during the site investigation.

9.4.51 No asbestos was encountered in any of the 63 samples analysed from West Riverside and Woodbank House.

9.4.52 The elevated concentrations of heavy metals in Made Ground summarised above will require further assessment in the context of the revised development plan.

9.4.53 The end use scenario in the area to the east of Pier Road / west of River Leven will be holiday accommodation based on woodland lodges linked by woodland paths. A monorail is proposed to travel across this area from south to north. There will be car parking in the northern part and commercial uses in the southern area including a brewery and a bike shop. As such, the potential for exposure of future site users to contamination in soils will be reduced compared to the residential gardens scenario used as a nominal (conservative) preliminary assessment scenario and should be reassessed accordingly.

9.4.54 The area to the north of Ben Lomond Way is proposed for a visitor hub, indoor water park and an apart hotel with car parking. As such, there will be very limited exposure of future human site users to any contamination present in soils.

Geoenvironmental Conditions – Groundwater

9.4.55 Samples from 15 boreholes across the site recorded concentrations of heavy metals that were, in some cases, elevated by comparison to the most conservative assessment criteria typically Annual Average (AA) EQS. However, with the exception of zinc and copper (which do not have a Maximum Allowable Concentration EQS), none of the samples were elevated by comparison to the less conservative Maximum Allowable Concentration (MAC) EQS.

9.4.56 The EQS for both copper and zinc are based on bioavailable concentrations, whereas the laboratory results are for the dissolved metals regardless of bioavailability. The actual bioavailable proportion would inevitably be lower than the total amount measured.

9.4.57 EQS thresholds are designed to be protective of the freshwater environment and are therefore intended to be applied at a compliance point within the surface water, after dilution has occurred, or to direct discharges. Therefore, it is highly conservative to compare these thresholds to samples of ground water recovered from boreholes within made ground or natural soils.

9.4.58 Both the River Leven and Loch Lomond have both been given a status of Moderate ecological potential by SEPA in 2020.

9.4.59 It is considered highly unlikely that groundwater from the Site is causing significant pollution of Loch Lomond or the River Leven as a result of the marginal concentrations of contamination encountered here. Contaminants have been recorded at relatively low concentrations and are likely to exhibit relatively low mobility through soil pores. The rate of flux of shallow perched groundwater from below the site into Loch Lomond is likely to be low. Furthermore, if contaminated groundwater from the site did reach the river or loch, the effect of dilution from such a large body of water would be highly effective.

Geoenvironmental Conditions – Ground Gas

9.4.60 Ground gasses were measured in 36 boreholes across the site on six occasions. The results and a ground gas risk assessment are included in **Appendix 9.2**.

9.4.61 Using the approach recommended in CL:AIRE (2012) and endorsed in BS 8485:2015, the Woodbank House area and the area of the Riverside site to the west of Pier Road and south of Ben Lomond Way may be classified as Characteristic Situation 1 (CS1) as defined in BS 8485:2015. This situation is representative of ground with a very low potential for gas generation. For CS1, BS 8485:2015 advises that no special gas protection measures are required.

9.4.62 Within the areas to the east of Pier Road and the north of Ben Lomond Way the site is classified as Category Situation 2 (CS2) for gas. This is due to the carbon dioxide (CO2) and methane (CH4) being recorded at concentrations above the trigger values of 5% and 1% respectively during the monitoring even though flow rates remained low.

9.4.63 The elevated concentrations of ground gases correspond with Made Ground and peaty soils.

9.4.64 Although flow rates remained low, depending on the nature of the structures proposed for this area, there may be a requirement to incorporate gas protection measures. The appropriate gas protection measures are dependent on the proposed building design and end use, however, typically gas protection measures comprise a combination of barrier (e.g. concrete slab, gas resistant membrane) and a ventilation layer (e.g. a void space).

Ground Stability Hazards and Geotechnical Considerations

9.4.65 If buried services that are sensitive to settlement (e.g. sewers) are required within the eastern area, it may be necessary to avoid areas of Peat, excavate and replace Peat or, use ground improvement techniques.

9.4.66 Shallow spread foundations are unlikely to be suitable within the eastern area where deeper Made Ground, Alluvium and Peat are present.

9.4.67 The measured pH values and concentrations of water soluble sulphate measured on samples of soils recovered as part of the preliminary ground investigation are summarised in **Appendix 9.2** below. It is assumed that the groundwater conditions at the Site are mobile and therefore it is considered that the Aggressive Chemical Environment Concrete (ACEC) class for the site is AC2z.

9.4.68 Utilities including the INEOS High Pressure Oil Pipeline and other gas apparatus are known to be present below the surface of the site. Known utilities (and where available, standoff zones) are included the figures in **Appendix 9.2**.

9.4.69 A belowground void was encountered during hand digging at borehole WS 40. It was later suggested that this void relates to a redundant 18” culvert at approximately 2m depth. The direction and extent of this feature is not known and may require further investigation with an excavator. This feature is not included on service plans which have been reviewed (and are included the figures in **Appendix 9.2**) which suggests that it is not Scottish Water plant.

9.4.70 The eastern area of the site is known to have had extensive rail lines running north / south. The extent to which these rail lines have been removed or simply buried is not known.

Summary of Identified Sensitive Receptors

9.4.71 Sensitive receptors will include development and maintenance workers, future users, surface and groundwater and proposed buildings and structures, as shown in **Table 9-6** below.

Table 9-6: Summary of Sensitivity of Potential Receptors

Receptor	Sensitivity	Comment
Site Workers	High	Ground workers and construction workers are likely to come into direct contact with soils, albeit for a short period of time.
Future Site Users	High	Future users include employees, day visitors and residential tourists who will have variable exposure scenarios to the potential contaminants/ground gases.
Offsite Users	High	Off-site workers, visitors and residents including potential groundwater users.
Groundwater Resources	High	The superficial and bedrock aquifers beneath the Site have been classified by SEPA has being in Good condition, with a target of continuous improvement. The superficial groundwater encountered during the ground investigation is considered to be perched rather that a continuous groundwater body.
Surface Water Resources	Moderate	The site is immediately adjacent to the River Leven and Loch Lomond which are considered to be of Moderate ecological potential.
Built Environment	Moderate	Proposed buildings are potentially at risk from aggressive ground conditions caused by low pH or high sulphate and from the build-up of gases in confined spaces.

Baseline Evolution

9.4.72 In the absence of the proposed development, the future baseline conditions would likely remain consistent with the existing conditions onsite.

9.4.73 However, as described in **Chapter 10**, climate change may cause higher water flows and more frequent and intense rainfall events which would likely result in higher water levels in the adjacent Loch Lomond and River Leven. Higher groundwater levels could form a pathway (linkage) through the mobilisation of ground contamination present onsite which could have an adverse effect on the nearby waterbodies, and possibly, human health receptors.

9.5 Embedded Mitigation

9.5.1 As detailed in **Chapter 2**, a number of design features and embedded mitigation measures have been incorporated into the design and construction of the proposed development to avoid, prevent, or minimise significant adverse environmental effects and to enhance the beneficial effects.

9.5.2 The embedded mitigation measures of relevance to this assessment are set out below.

- Construction Environmental Management Plan (CEMP) will be prepared and implemented during the construction phase of the proposed development. The purpose of the CEMP is to mitigate any adverse environmental effects and will specifically include the following:
  - A watching brief for the visual and olfactory assessment of the soil and groundwater (if encountered) will be maintained with sampling and testing for verification and assessment purposes where necessary;
  - Contaminated hotspots plan (procedure for encountering unexpected contamination);
  - Surface water and groundwater protection measures (including an emergency spillage response procedure) and working to the SEPA GGP (guidance for pollution prevention) 5: Works and maintenance in or near water;
  - GPP 2: Above ground oil storage tanks, GPP 8: Safe storage and disposal of used oils and GPP 26 Safe storage – drums and intermediate bulk containers;
  - GPP 13: Vehicle washing and cleaning;
  - GPP 21: Pollution incident response planning;
  - GPP 22: Dealing with spills;
  - Details around dust suppression measures, which will be required during periods of prolonged dry weather;

- An exclusion zone will be present around either side of the INEOS gas pipeline;
- If required, remediation is likely to comprise localised excavation of contaminated soils and / or capping with clean material to present a barrier between contamination and receptors. In the case of proposed buildings or areas of hardstanding, the barrier will be integral to the design of the new development;
- If required, gas protection measures will be incorporated into the design of the proposed buildings to protect the building structures and human health (future end users). Depending on the design of certain structures such as woodland lodges, the requirement for gas protection measures may be mitigated by the presence of an air gap beneath the buildings;
- Site-specific risk assessment specifically designed to assess the risks posed by piling. Ultimately, if piled foundations are required, the technique used will be selected on the basis of protecting deep groundwater from contamination; and,
- Risk Assessments and Method Statements (RAMS) will be prepared. Construction/ground workers should take cognisance of the contamination reported and will be required to work in accordance with the RAMS which will include the use of appropriate safety equipment and personal protective equipment (PPE).

9.5.3 In relation to geology and ground conditions, it is not anticipated that specific embedded mitigation will be required at the operational phase of the proposed development.

9.6 Assessment of Likely Effects

9.6.1 This section is an assessment of the potentially significant effects from the proposed development on the sensitive receptors identified in **Section 9.4** (summarised in **Table 9-6** above). It also considers the effects of potentially contaminated ground or groundwater conditions on the proposed development.

9.6.2 The assessment of effects takes the embedded mitigation (identified in **Section 9.5** above) into account.

Construction Phase

Human Health (Construction Workers)

9.6.3 The risk to site workers during the construction works relates to the risk of skin contact, inhalation and ingestion of contaminated material on the site. In accordance with current health and safety legislation, the contractor will be required to adopt measures to mitigate the risk to site workers.

9.6.4 Based on site investigations to date, it has been established that there are some potentially elevated contaminants in soils at the Site associated with the former neighbouring works, infilled Made Ground and naturally occurring Peat which can produce ground gasses. However, the likelihood of severe / mobile contaminations is considered low.

9.6.5 Localised, potentially elevated contaminants were identified during the previous preliminary ground investigation, including hotspots of heavy metals (lead and less frequently, arsenic and hexavalent chromium) in the Made Ground in the eastern part of the Site.

9.6.6 The Woodbank House area while free of identified contaminant may have issues associated within the footprint of the former hotel which was destroyed by fire and in some areas has therefore not been fully investigated at this stage.

9.6.7 Humans are considered highly sensitive receptors. Without prior knowledge of the Site or appropriate planning and mitigation measures, construction workers' health could potentially be adversely affected by contamination. It is noted that the assessment presented in the 2017 report used the assessment criteria for residential soils in private gardens. These are based on the potential long-term exposure of residents to soils. It would be highly conservative to apply these assumptions (and therefore these assessment criteria) to construction / groundworkers who are only likely to come into contact with soils for a brief period of time during belowground work.

9.6.8 Following the completion of the proposed development, the presence of hardstanding / buildings and managed landscaping will reduce infiltration (and therefore potential migration) of contamination in the subsurface. Pathways to sensitive receptors will be broken and no direct contact with workers or users will result.

9.6.9 Once the embedded mitigation has been implemented, the construction phase of the proposed development is likely to have a direct **Minor Adverse** effect on construction workers.

Human Health (Neighbours)

9.6.10 Measures will be adopted to mitigate the risk to offsite users associated with air borne or settled dust arising from areas of potentially contaminated land. Such measures will include the selection of appropriate methods to reduce disturbance to the existing near-surface soils present on the Site, such as the spraying of stockpiles and other large, unsealed surfaces to limit the risk of generating air borne dust and covering of excavated materials.

9.6.11 Dust mitigation measures may be required in the event of prolong warm dry weather.

9.6.12 Once the embedded mitigation has been implemented, the construction phase of the proposed development is likely to have an indirect **Minor Adverse** effect on neighbours.

Water Environment (Groundwater and Surface Resources)

9.6.13 It is considered highly unlikely that groundwater from the Site is causing significant pollution of Loch Lomond or the River Leven as a result of the marginal concentrations of contamination encountered. Contaminants have been recorded at relatively low concentrations and are likely to exhibit relatively low mobility through soil pores. The rate of flux of shallow perched groundwater from below the site into Loch Lomond is likely to be low. Furthermore, if contaminated groundwater from the site did reach the river or loch, the effect of dilution from such a large body of water would be highly effective.

9.6.14 Without prior knowledge of the Site or appropriate planning and mitigation measures, it is possible that construction techniques (notably piling, deep excavations and ground improvement) could mobilise contaminants and / or introduce pathways via which contaminants could migrate to the groundwater. However, mitigation (considered as embedded mitigation in this assessment) will be required as good construction practice in accordance with the CEMP and CAR regulations.

9.6.15 There is potential however, for the accidental release of stored fuels and chemicals directly affecting localised areas of the surface water and groundwater quality during the construction of the proposed development. These pollution incidents may occur due to incorrect storage / transport / use of materials such as fuels, oils and chemicals. With containment in place, any accidents may result in the containment system being affected and a greater risk of measures being defeated. The presence of hardstanding / buildings and surface planting should reduce infiltration (and therefore migration).

9.6.16 Overall, once the embedded mitigation has been implemented, the construction phase of the proposed development is likely to have a **Minor Adverse** effect on the water environment (both groundwater and surface water resources).

Operational Phase

Human Health (Future Users)

9.6.17 There is the potential for future site users and maintenance workers to be affected by exposure to potential contaminants including metals and asbestos where Made Ground material is to remain in place in any proposed soft landscaped areas.

9.6.18 Based on the ground gas risk assessment, future users could be exposed to hazardous ground gases within any buildings or confined spaces, and the risk level is variable across the different areas of the Site. The ground gas risk assessment has characterised the Site and provides preliminary recommendations for mitigation measures to be incorporated into design of buildings at the Site which would result in a **Negligible** effect which is Not Significant.

Built Environment

9.6.19 The built environment, including foundations and services, can be affected by aggressive ground conditions, particularly sulphates and acids. Once the embedded mitigation has been

implemented, the operational phase of the proposed development is likely to have a **Negligible** effect on the build environment.

9.6.20 In relation to ground instability, subject to appropriate ground investigation, geotechnical assessment and design, it is not anticipated that there will be any effects during operation of the Proposed Development.

9.7 Further Mitigation and Enhancement

9.7.1 The following additional mitigation measures are proposed to ensure that detailed design stages are informed by

- Additional intrusive investigation will require to be undertaken in specific localised areas to inform detailed design and delineate contamination. The results will be assessed in the context of the detailed master plan and, if required, a remediation strategy will be developed; and,
- Further intrusive investigation may be required in within and around the derelict buildings in the Woodbank House area to determine the potential for contaminants of concern including asbestos and PAHs. It is understood that the existing relic buildings will be renovated to form apartment accommodation.

9.8 Residual Effects

9.8.1 Taking account of all proposed mitigation and enhancement measures, the likely residual effects from the construction and operation of the proposed development on ground conditions are identified in **Table 9-7** below.

Table 9-7: Summary of Likely Residual Effects Related to Ground Conditions (Construction Phase)

Receptor	Residual Effect Significance	Justification
Human Health (site workers)	Minor Adverse	The Contractor will take cognisance of the investigation works undertaken and prepare Risk Assessment Method Statements (RAMS) as appropriate. The CEMP will document the procedures to minimise and manage spillages from chemical storage, dust generation, dewatering discharges and run-off. The possibility exists for unexpected conditions to be encountered during groundworks, therefore a watching brief should be maintained. Work should be halted in the event of unexpected, potentially detrimental conditions pending further assessment.
Human Health (future site users, workers, guests, customers and maintenance workers)	Not Applicable	Not a construction phase receptor.
Water Environment	Minor Adverse	Construction phase will occur following some further site investigation and, if necessary, site remediation. As such, contaminants in the subsurface will have been quantified and deemed to pose an acceptably low risk or remediated. Piling and / or other ground improvements / deep excavations will only take place following a specific risk assessment and method statement. Techniques to minimise the creation of pathways / mobilisation of contaminants will be employed.

Receptor	Residual Effect Significance	Justification
		The CEMP will document the procedures to minimise and manage spillages from chemical storage, dust generation, dewatering discharges and run-off.
Built Environment	Not Applicable	Not a construction phase receptor.
Ecological Systems	Not Applicable	No designated ecological sites have been identified in the vicinity, mitigation measures for the site Ecology are addressed in other Chapters of this EIA.

9.9 Monitoring

9.9.1 In the absence of any likely significant adverse effects, no monitoring is considered to be proportionate or required.

9.10 Cumulative Effects

9.10.1 There are no cumulative developments of relevance to the assessment of ground conditions.

9.11 Summary

9.11.1 This chapter of the EIAR provides an assessment of the likely significant effects from the proposed development on ground conditions. It also assesses the effects from the ground conditions such as potential contamination on the proposed development.

9.11.2 The Woodbank House area is currently occupied by fields used for grazing, vegetated with woodland and various ruined buildings formerly associated with a hotel. The West Riverside area is occupied by woodland and walking paths and two INEOS oil pipelines run through the site from west to east.

9.11.3 A ground investigation undertaken in 2017 has characterised ground conditions across the Site, which comprise natural drift deposits with Alluvium (soft, sandy, clayey peat) primarily to the east of Pier Road, Glaciofluvial Deposits (sands and gravels with silt and clay), Till (gravelly sandy clay) and Made ground of more than 1m thick (almost entirely restricted to the eastern part of the site where former railway lines ran).

9.11.4 Soils containing potentially elevated contaminants were primarily restricted to the area to the east of Pier Road and to the North of Ben Lomond Way. The primary contaminant of concern was lead which was potentially elevated in 14 soil samples. There are single isolated occurrences of potentially elevated concentrations of arsenic and chromium (VI), respectively. More detailed assessment of the potential risks posed by contaminants will be undertaken in the context of detailed design following this PPiP stage. It is likely that some remediation measures will be required in the eastern area where woodland cabins are proposed, however, if required, remediation is likely to be localised excavation and / or capping of contaminated soils.

9.11.5 The results of the analysis of groundwater samples have confirmed the presence of slightly elevated concentrations of heavy metals in some of the boreholes. The concentrations encountered are considered not likely to pose a significant risk to the sensitive water environment receptors (Loch Lomond and River Leven).

9.11.6 Ground gas monitoring indicates that the area east of Pier Road and north of Ben Lomond Way will be classified in accordance with British Standard BS 8485 as Characteristic Situation 2 (CS2) as a result of concentrations of carbon dioxide and methane in exceedance of trigger values. The design of buildings in these areas may require the inclusion of gas protection measures, however, the nature and need for protection measures will be to some extent dependent on the design and characteristics of the buildings. The results for the remainder of the site indicate that it would be classified as Characteristic Situation 1 (CS1) and no gas protection measures will be required.

9.11.7 Additional area-specific site investigation will be designed to quantify the potential sources of contamination and to inform the design of the remediation / mitigation measures to be adopted.

Investigations will also be required to target areas of potential instability associated with former Made Ground deposits and in areas of Peat and at heavily loaded or unusual structures such as the swimming pool and monorail stanchions.

9.11.8 Once embedded mitigation is taken into account, the likely construction and operational phases of the proposed development effects result in Minor Adverse effects which are considered to be Not Significant.

9.12 References

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10 Water, Hydrology & Flood Risk

10.1 Introduction

10.1.1 This chapter of the EIAR provides an assessment of the likely significant effects from the proposed development on water, hydrology and flood risk. The assessment is based on the characteristics of the site and surrounding area and the key parameters of the proposed development detailed in **Chapter 2 – Site and Proposed Development**.

10.1.2 This chapter has been prepared by Stantec. In accordance with Regulation 18(5) of the Town and Country Planning (Environmental Impact Assessment) Regulations 2017, as amended, a statement outlining the relevant expertise and qualifications of competent experts appointed to prepare this EIAR is provided in **Appendix 1.1.**

10.1.3 The aims of this chapter are to:

- Identify the relevant context in which the hydrological and flood risk assessment has been undertaken;
- Describe the methods used to undertake the assessment;
- Outline the relevant baseline conditions currently existing at the site and surroundings;
- Identify the potential direct and indirect effects of the proposed development on the water environment;
- Identify mitigation and enhancement measures where required to address identified effects;
- Assess residual predicted effects; and,
- Assess cumulative effects on the water environment from the proposed development in combination with other relevant cumulative developments.

10.1.4 This chapter is supported by the following figures and technical reports provided in **Appendices 10.1 - 10.3**:

- **Appendix 10.1 – Figures**;
- **Appendix 10.2 – Flood Risk Assessment (FRA)**; and,
- **Appendix 10.3 – Drainage Strategy**.

10.2 Policy Context, Legislation, Guidance and Standards

Legislation

10.2.1 The overarching legislative framework applicable to this EIA for the proposed development is outlined in **Chapter 4 – Legislative and Planning Policy Context**. Subject specific legislation of relevance to this assessment is:

- Water Environment and Water Services (Scotland) Act 2003 (WEWS Act);
- Water Environment (Controlled Activities) (Scotland) Regulations 2011 (CAR);
- Water Environment (Controlled Activities) (Scotland) Amendment Regulations 2013;
- Water Environment (Miscellaneous) (Scotland) Regulations 2017;
- Flood Risk Management (Scotland) Act 2009;
- Water Environment (Oil Storage) (Scotland) Regulations 2006;
- Water Environment (Groundwater and Priority Substances) (Scotland) Regulations 2009; and,
- The Private Water Supplies (Scotland) Regulations 2006.

10.2.2 All activities with potential to impact on the water environment require to be authorised under the Water Environment (Controlled Activities) (Scotland) Regulations 2011, as amended (CAR). The level of authorisation required is dependent on the anticipated environmental risk posed by

the activity to be carried out. Liaison with SEPA operations team will be undertaken at an early stage to further confirm this. These activities could include construction drainage, dewatering, storage of oil and the three watercourse crossings.

10.2.3 Revised levels of authorisation, including amendments to the General Binding Rules (GBR), came into effect on January 1st 2018. These include the need for CAR authorisation for drainage of construction sites over four hectares in size, as well as a change to the size of development that will require authorisation for the permanent surface water drainage. The below summarises the requirements of these regulations.

10.2.4 For the construction SUDs associated with a site of this size, a complex CAR licence will be required, as detailed in the CAR Practical Guide (SEPA, 2022)

Policy

10.2.5 The planning policy framework applicable to this EIA for the proposed development is outlined in **Chapter 4 – Legislative and Planning Policy Context**. The statutory Development Plan applicable to the site is the L**och Lomond and the Trossachs National Park (LLTNP) Local Development Plan (LDP) (2016**

10.2.6 LDP planning policy considerations of specific relevance to this assessment are:

- Adopted **Loch Lomond and the Trossachs National Park (LLTNP) Local Development Plan (LDP) (2016)** including relevant policies outlined in **Table 4-2**, in particular:
  - Overarching Policy 1 – Strategic Principles;
  - Overarching Policy 2 - Development Requirements;
  - Natural Environment Policy 11 – Protecting the Water Environment;
  - Natural Environment Policy 12 - Surface Water and Waste Water Management;
  - Natural Environment Policy 13 – Flood Risk;
  - **LLTNP Partnership Plan 2018 – 2023**, in particular outcomes 1-3 and 5-9; and,
  - **National Planning Framework 3 (NPF3) (2014)**.
- **Scottish Planning Policy (SPP) (2014)** including relevant provisions outlined in **Table 4-1**, in particular:
  - Principal Policy on Sustainability (paragraphs 24-35);
  - Valuing the Natural Environment Subject Policy (Paragraphs 193 - 233); and,
  - Managing Flood Risk & Drainage Subject Policy (Paragraphs 254-268).
  - SEPA's Development Management Guidance: Flood Risk (2018);
  - Scottish Government Online Planning Advice regarding Flood Risk (2015);
  - PAN 61 Planning and Sustainable Urban Drainage Systems (July 2001); and,
  - PAN 79 Water and Drainage (September 2006).

10.2.7 Other policy considerations of relevance to this assessment are:

- The River Basin Management Plan for Scotland: 2021–2027 (Scottish Government, 2021).

Guidance and Relevant Technical Standards

10.2.8 The following guidance and technical standards have informed this assessment:

- The Water Environment (Controlled Activities) (Scotland) Regulations 2011 (as amended): A Practical Guide (SEPA);
- Masters-Williams, H., Heap, A., Kitts, H., Greenshaw, L., Davis, S., Fisher, P., Owens, D. (2001). Control of water pollution from construction sites. Guidance for consultants and contractors (C532). London: CIRIA;
- SEPA (2006) Guidelines for Water Pollution Prevention from Civil Engineering Contracts;

- SEPA (Various). Guidance for Pollution Prevention including PPG 1, 3, and 6 and GPP2, 5 and 21;
- SEPA (2009). Engineering in the water environment good practice guide; Temporary construction methods;
- SEPA (2014). Land Use Planning System SEPA Guidance Note 31; Guidance on Assessing the Impacts of Development Proposals on Groundwater Abstractions and Groundwater Dependent Terrestrial Ecosystems;
- SEPA (2019). Technical flood risk guidance for stakeholders;
- SEPA (2016). Supporting Guidance; General binding rules for surface water drainage systems (No. WAT-SG-12);
- SEPA (2019). Regulatory method; Sustainable Urban Drainage Systems (SUDs or SUD Systems) (No.WAT-RM-08);
- SEPA (2010). Good Practice Guide – River Crossings (No. WAT-SG-25);
- SEPA (2019). Climate Change Allowances for Flood Risk Assessment in Land Use Planning;
- SNH (2013). Environmental Assessment Handbook; and,
- Woods Ballard, B. (2015). The SUDS Manual: CIRIA.

10.3 Methodology

Overview

Assessment Scope

10.3.1 The principal aspects considered within this assessment are:

- Flood risk;
- Surface water drainage;
- Pollution prevention and environmental management;
- Engineering activities in the water environment;
- Existing groundwater abstractions;
- Water abstractions; and,
- Disruption to wetlands.

10.3.2 The water, hydrology & flood risk chapter presents an assessment of likely significant effects on the water environment from the proposed development. The assessment presented in this chapter has been prepared in accordance with the EIA Regulations.

10.3.3 The assessment of likely effects makes comparison with the baseline year, 2022 during which time the site surveys including a walk over survey in 2017 were carried out.

Assessment Process

10.3.4 In undertaking the assessment presented in this ES chapter, the following activities have been carried out:

- EIA screening and scoping (see below);
- Desk based review of available information, including previous studies, topographic, flood and geological maps, identification of local water receptors, surface water drainage and wetlands;
- A walkover survey of the site;
- Evaluation of baseline water environment conditions (**Section 10.4**);
- Development of a drainage strategy for the proposed development, which is presented as **Appendix 10.3**; and,

- Identification and assessment of likely significant effects, taking into account proposed mitigation and enhancement measures and including consideration of likely cumulative effects (**Sections 10.7 - 10.8**).

Consultation

EIA Screening and Scoping

10.3.5 The assessment has been informed by an EIA Screening and Scoping Report (Stantec, May 2021) and subsequent EIA Screening and Scoping Opinions issued by LLTNPA (27th July 2021) in respect of the EIA for the proposed development. The EIA Scoping Opinion is provided in full in **Appendix 3.1**. Meetings and discussions with SEPA and West Dunbartonshire Council were undertaken as part of the original assessment in 2017 & 2018 to inform the design of the proposed development and the scope of the assessment. **Table 10-** below provides a summary of relevant consultee responses from the EIA Scoping Opinion and other discussions.

Table 10-1: Summary of Consultation Responses

Consultee	Comment	How and Where Addressed
SEPA	SEPA stated within the formal Scoping Opinion that the assessment should cover the following: ▪ Flood risk; ▪ Waste water drainage; ▪ Surface water drainage; ▪ Pollution prevention and environmental management; ▪ Engineering activities in the water environment; ▪ Existing groundwater abstractions; ▪ Water abstractions; and, ▪ Disruption to wetlands.	These are addressed within of this chapter. Further detail is provided within **Appendix 10.2: Flood Risk Assessment** and surface and waste water drainage covered under **Appendix 10.3: Drainage Strategy.**
SEPA	SEPA advised that they have no record of CAR authorisation for any abstractions within the site, and no records of private water supplies were held.	Noted under **Section 10.4- Baseline Conditions.**
SEPA	Between July 2017 and January 2018, a number of meetings have been held with SEPA, along with email correspondence, with respect to the potential flood risk on site. SEPA hydrometry experts had flagged concerns with the flow data used within the flood study and Flood Risk Assessment due to poor recording at the gauging station on the River Leven. This raised questions as to the accuracy of the peak flood levels identified in the Flood Risk Assessment.	In order to provide more confidence in the flow data used within the study, and the subsequent design flood levels, additional hydrological analysis was undertaken. This additional work calculated flow rates using a number of methods to verify the existing available data and indicated that the outputs from the Flood Risk Assessments would be representative of the extreme flooding scenarios. This was issued to SEPA for review and initial consultation indicated that this was acceptable to them. The additional hydrological analysis and subsequent correspondence is appended to **Appendix 10.2: Flood Risk Assessment**.
West Dunbartonshire Council	Environmental health department advised that they have no private water supplies within the development site.	Noted under **Section 10.4- Baseline Conditions**.

Study Area

10.3.6 The study area for the assessment of potential effects on the water environment is generally consistent with the site boundary, as shown in **Appendix 2.1 – Site Location Plan**. The wider catchment area has also been considered where appropriate, for example the potential effect of the proposed development on downstream flood risk has been assessed.

10.3.7 The wider hydrological catchments include the upstream catchment of the River Leven, which encompasses Loch Lomond, as well as downstream along the River Leven through Balloch and Alexandria.

Information Sources

Desk Top Study

10.3.8 A review of relevant information, guidance and planning policy relating to the proposed development was undertaken to characterise the landscape and visual baseline of the site and surrounding area including:

- Ordnance Survey (OS) 1:10,000 & 1:25,000 digital mapping;
- Topographical survey of the Proposed Development site;
- British Geological Survey (BGS) 1:50,000 digital map data;
- British Geological Survey (BGS) User Guide: Aquifer Productivity (Scotland) GIS datasets, Version 2;
- Digital soil maps published by the Scottish Government and James Hutton Institute;
- Aerial photography of the site;
- Catchment extents and characteristics from the Flood Estimation Handbook (FEH) website (CEH, 2022);
- The online SEPA River Basin Management Plan Interactive Map and Flood Map;
- River Leven Flood Study undertaken by Jacobs in 2001, along with the updates to the study in 2003 and 2009; and,
- Annual Maximum (AMax) flow data from SEPA for the Linnbrane gauging station on the River Leven, covering the period 1963-2015.

Fieldwork

10.3.9 A site walkover for the flood risk assessment was undertaken on 3rd March 2017. The weather on the day was sunny and fine, and there had been little precipitation in the days prior to the site visit. A photographic record of this site walkover is presented in **Appendix 10.2: Flood Risk Assessment.**

10.3.10 This walkover covered the whole of the development site and included inspection of existing watercourses and water features on site, detailing their condition and any likely flood mechanisms.

Approach to Assessment

Identification of Relevant Receptors

10.3.11 Based on the information sources outlined above, the current baseline characteristics of the water environment at site and the surrounding area was characterised. This led to the identification of relevant sensitive receptors to consider within the assessment. Receptor sensitivity is defined based on the capacity of the receptor to accommodate change without fundamentally altering its character. The definitions provided in take into account the quality of the receptor, its purpose and the potential for substitution or replacement.

Impact Assessment Methodology

10.3.12 **Table 10-1** sets out the criteria for assessing the likely magnitude of the change due to the proposed development upon identified sensitive receptors.

Table 10-1 : Criteria for Assessing Receptor Sensitivity

Receptor Sensitivity	Description
Low	Receptors with a high capacity to accommodate change, low value or poor condition and no significant uses, for example: ▪ Receptor is not an internationally, nationally or locally designated site; ▪ Not classified as a surface water body for the River Basin Management Plan; ▪ No sensitive flood risk receptors downstream; ▪ Surface water body not significant in terms of fish spawning and no other sensitive aquatic ecological receptors e.g. freshwater pearl mussels; ▪ Surface water body not used for abstraction; ▪ Surface water body not used for recreation directly related to water quality e.g. angling, swimming, and watersports; and, ▪ Aquifer with no identified abstractions.
Medium	Receptors with a moderate capacity to accommodate change, medium value or condition and limited use, for example: ▪ Receptor is not an internationally or nationally designated site. May be a locally designated site; ▪ Salmonid species may be present and surface water body may be locally important for spawning. No other sensitive aquatic ecological receptors e.g. freshwater pearl mussels; ▪ Surface water body used for private water supply or medium scale industrial/ agricultural abstractions; ▪ Surface water body used for occasional or local recreation e.g. local angling clubs; ▪ Groundwater body supports identified private water supplies or medium scale industrial/ agricultural abstractions; and, ▪ Carbon-rich soils which have been affected by historic or current land management practices.
High	Receptors with a low capacity to accommodate change, high value or condition and significant use, for example: ▪ Receptor is an internationally or nationally designated site. ▪ Surface water body supports sensitive aquatic ecological receptors e.g. freshwater pearl mussels; ▪ Surface water body used for public water supply or large scale industrial/ agricultural abstractions; ▪ Surface water body important for recreation directly related to water quality e.g. swimming, watersports, angling; ▪ Groundwater body supports public water supply or large scale industrial/ agricultural abstractions; and, ▪ Carbon-rich soils which form part of intact, active blanket bog in good condition.

Table 10-2 - Criteria for Assessing Magnitude of Change

Magnitude of Change	Definition
Negligible or no change	Very light changes from baseline (pre-development) conditions. Change barely distinguishable, approximating to the “no change” situation.
Slight	Minor shift away from baseline (pre-development) conditions. Change arising from the loss/alteration will be discernible but underlying character/composition/attributes of the baseline condition will be similar to pre-development circumstances/patterns.
Moderate	Loss or alteration to one or more key elements/features of the Baseline (pre-development) conditions such that post-development character/composition/attributes of baseline will be partially changed.
Substantial	Total loss or major alteration to key elements/features of the baseline (pre-development) conditions such that post-development character/composition/attributes will be fundamentally changed.

Establishment of Effect Level and Significance

10.3.13 The criteria set out in **Table 10-1** and **Table 10-2** have been used to develop a simple table to assess the significance of likely effects of the proposed development on the water environment, as shown in **Table 10-3** below.

10.3.14 This methodology is derived from the NatureScot Environmental Assessment Handbook (NatureScot, 2018). The assessment of likely effects also considers the probability of the effect occurring (certain, likely, possible or unlikely) and the duration of the effect (short (less than 2 years), medium (2 – 5 years) or long term) (more than 5 years). Residual effects (direct and indirect) at levels of Moderate to Major as identified in **Table 10-3** are considered to be significant in terms of the EIA Regulations.

Table 10-3: Criteria for Assessing Significance of Effects

Sensitivity of Receptor	Magnitude of Change			
	Substantial	**Moderate**	**Slight**	**Negligible/None**
High	Major	Major	Moderate	Negligible/None
Medium	Major	Moderate	Minor	Negligible/None
Low	Moderate	Minor	Minor	Negligible/None

Approach to Cumulative Impact Assessment

10.3.15 Cumulative effects on the water environment could occur where more than one development is proposed within a catchment, and **Chapter 2 – The Proposed Development** identified the relevant cumulative developments within the area. This included:

- Replacement building and infrastructure for Sweeney's Cruises;
- Lomond Hotel Alterations and Extension;
- Woodbank Inn Hotel Extension; and,
- Balloch Street Design Project.

10.3.16 A cumulative impact assessment for effects impacting the water environment has been undertaken and is included in **Section 10.11**.

10.3.17 This assesses whether any of the above developments will have an impact upon the proposed development in terms of the water environment, both independently and cumulatively.

10.4 Baseline

The Site

10.4.1 The site comprises two distinct areas known respectively as West Riverside and Woodbank House. Old Luss Road is the interface between the two areas. The project boundary is defined in the Parameters Plan in **Appendix 2.1**. The proposed site comprises a total area of c. 18.9 hectares.

10.4.2 The West Riverside area is bounded generally by the River Leven to the East, Loch Lomond Shores and Loch Lomond to the north, Old Luss Road and Ben Lomond Way to the west and Balloch Road and the Clairinsh residential area to the south.

10.4.3 This area comprises woodland, existing footpaths and recreational parkland alongside the river with the northern river shoreline used for mooring boats with pontoons present in the water for this purpose.

10.4.4 The Woodbank House area comprises the grounds of the former Woodbank Estate and is bounded generally by the A82 to the west, Old Luss Road to the east and the Lower Stoneymollan Road to the South.

10.4.5 The Woodbank House area of the site currently encompasses two relatively flat grassy fields in its eastern area which are bisected by an access track running from east to west. The track

leads to an area of mixed woodland in the western area which has a more varied topography with levels generally rising to the west and becoming particularly steep in the north-west. Within the woodland are the remnants of Woodbank House, outbuildings and a walled garden. The buildings are in a state of advanced dilapidation as a result of a fire (at the main hotel building) and subsequent dereliction.

Topography and Land Use

10.4.6 The general topography of the site falls from the west down to the east towards Loch Lomond and the River Leven. In the west of the site surrounding Woodbank House and adjacent to the A82, the ground is at a maximum elevation of approximately 45m AOD. From here the ground slopes down relatively steeply towards Old Luss Road, beyond which the ground levels off and undulates at 15-19m AOD. Adjacent to the shores of the Loch, the ground level is approximately 7.5m AOD.

10.4.7 The topography of the West Riverside area varies along its length. In the north adjacent to the Pierhead and the shores of the loch, the ground levels rise from approximately 8.5m AOD up to a maximum of 15.5m AOD at the top of an embankment which is currently heavily vegetated. Alongside the River Leven the top of bank levels are approximately 8.0m AOD with the ground then raising up to approximately 10.5-11.0m AOD. In the southern area where the existing tourist information centre is located, the ground levels are approximately 11.0-12.0m AOD, with a general fall in ground levels towards the river.

10.4.8 The site currently consists of a range of different uses including leisure and recreation (water sports) along the shores of the loch, several areas of car parking which serve the public slipways as well as the neighbouring Loch Lomond Shores development and areas of woodland and open parkland along the banks of the River Leven.

10.4.9 A tourist information and visitor centre is located at the south eastern point of the site, opposite Balloch train station and Sweeney's Cruises.

Surface Water Hydrology

10.4.10 There are four watercourses which have been identified as flowing through the site. The major watercourse is the River Leven which flows to the east of the site. To the west of the site there are two smaller unnamed watercourses which are described in more detail below. A fourth smaller watercourse is marked upon the Ordnance Survey mapping within the wooded area at Woodbank House. A plan showing the location of these watercourses is presented as **Figure 10-1** in **Appendix 10.1 – Figures**. Additional details including photographs from the site walkover are included in **Appendix 10.2 - Flood Risk Assessment**.

River Leven

10.4.11 The River Leven flows to the east of the site in a southerly direction. It rises at the outflow from Loch Lomond to the north of the development site, and routes south through the towns of Balloch and Alexandria to outfall into the River Clyde at Dumbarton. The river is approximately 11.5km long and has tidal influence for approximately 5km upstream from its confluence with the River Clyde.

10.4.12 Adjacent to the site, the river is approximately 85-90m wide and contains a number of floating pontoons for mooring boats. Approximately 550m downstream of the Balloch Station area of the site, the River Leven Barrage is located. This is operated by Scottish Water and controls the outflow from the loch limiting the discharge and maintains water levels within Loch Lomond between 7 and 7.6m Above Ordnance Datum (AOD). However, it is not formally operated as a flood prevention structure.

10.4.13 Scotland's River Basin Management Plan (RBMP) (SEPA, 2021) classified the River Leven in 2020 as a heavily modified water body on account of physical alterations that cannot be addressed without a significant impact from an increased risk of subsidence or flooding. As such this has been classified as having Moderate ecological potential.

Loch Lomond

10.4.14 Loch Lomond is located to the north of the site and has a surface area of approximately 71 km^2. Areas within and adjacent to the water body are designated Special Protection Areas (SPA), Sites of Special Scientific Interest (SSSI), Special Areas of Conservation (SAC), Ramsar Sites

and National Nature Reserves. The loch is located wholly within the Loch Lomond and The Trossachs National Park and is used extensively for recreational use.

10.4.15 The RBMP classified Loch Lomond (south, ID:100257) as a heavily modified water body on account of modifications that cannot be fully addressed without a significant impact on an airport or major transport route. As such this has been classified as having Moderate ecological potential status in 2020.

Unnamed Watercourse 1

10.4.16 The Unnamed Watercourse 1 rises in the hills to the west of the A82. The burn flows in an easterly direction along the north-western boundary of the Woodbank House area and passes beneath Old Luss Road before routing north of the existing car park and Loch Lomond Shores development. It outfalls into Loch Lomond at the end of a small headland in the bay north of the site.

Unnamed Watercourse 2

10.4.17 Unnamed Watercourse 2 also rises in the hills to the west of the site and the A82, and routes in an easterly direction towards Drumkinnon Farm. The burn flows through a small caravan park to the south of the Woodbank House site and below Lower Stoneymollan Road before routing along the eastern boundary of the Woodbank House area of the site. The burn then passes below Old Luss Road and routes north towards the car park of the Loch Lomond Shores complex. The burn routes through a number of culverts as it passes beneath access roads and flows through an open channel through the car park area.

10.4.18 Downstream of the car park the burn routes to the east and flows parallel with unnamed watercourse 1 towards Loch Lomond where it outfalls adjacent to the aerial adventure course.

Unnamed Watercourse 3

10.4.19 Within the Woodbank House area of the site a small watercourse is shown on plan routing in an easterly direction before it sinks, with no downstream route marked on the maps. During the site walkover there was water present within the channel however there was very little flow. The channel appeared to route into a culvert structure, but it is not known where this routes to or if it discharges into the unnamed watercourse 1. There were no visible signs of a culvert downstream across this area of the site.

Geology & Hydrogeology

Bedrock Geology

10.4.20 The British Geological Survey's (BGS) geological data (BGS, n.d.-a) (1:50,000 scale) indicates that the site is underlain by Teith Sandstone Formation. No fault lines are present within the site.

Drift Deposits

10.4.21 The BGS (BGS, n.d.-a) data indicates that the superficial deposits are predominantly formed of Glaciofluvial Deposits - Gravel, Sand and Silt, which cover the southern and western parts of the site. To the north and surrounding the shore of Loch Lomond the superficial deposits consist of Raised Marine Deposits of Holocene Age - Clay, Silt, Sand and Gravel.

Soils

10.4.22 Soil survey of Scotland 1:25,000 scale mapping (Soil Survey of Scotland Staff, n.d.) shows the site to be underlain by brown soils which have been stated to have parent materials of fluvioglacial sands and gravels derived from acid schists and Lower Old Red Sandstone sediments and lavas.

Hydrogeology

10.4.23 The Hydrogeological Map of Scotland (BGS, n.d.-b) shows that the site is underlain by the Strathmore Group, a moderate to highly productive aquifer with intergranular/fracture flow.

10.4.24 The Hydrogeological Maps highlight that superficial deposits classified as glaciofluvial are associated with high productivity intergranular flow, and raised marine deposits would be classified under low to moderate productivity with intergranular flow in the region of 0.1-10l/s.

10.4.25 The aquifer vulnerability is classed as 4a in the Groundwater Vulnerability dataset (Ó Dochartaigh, Doce, Rutter & MacDonald, 2011). Class 4a is groundwater which is described as being 'vulnerable to those pollutants not readily absorbed or transformed and may have low permeability soil and less likely to have clay present in superficial deposits.'

10.4.26 Under the RBMP the development site is located within the *Loch Lomond and Leven Sand and Gravel (ID:150766)* and *Balloch (ID:150651)* groundwater bodies, both of which have overall classifications of Good.

Flood Risk

10.4.27 In line with the SPP (2014) at paragraphs 254-268 and the recommendations of SEPA and West Dunbartonshire Council in relation to the proposed development, a comprehensive site-specific flood risk assessment (FRA) was undertaken to assess the risks associated with all potential flood sources. The FRA is included as **Appendix 10.2** and the key findings in relation to flood risk under existing site conditions are described here.

10.4.28 A flood study of the River Leven was first undertaken in 2001 and then updated in 2003. This assessed the flood risk along the length of the River Leven, from Loch Lomond through to Dumbarton in the south. In 2009 the hydraulic model was updated to include more recent hydrological analysis as well as calibration of the model using the December 2006 flood event. The FRA undertaken for this proposed development included additional hydrological analyses to verify the flow rates and flood levels output from the original flood study, and to provide a level of confidence in the results. This is presented in **Appendix 10.2 - Flood Risk Assessment**.

10.4.29 The FRA concluded that the areas in the northeast of the site adjacent to the head of the River Leven and Loch Lomond would be at risk of fluvial flooding during the 0.5% Annual Exceedance Probability (AEP) event, and the area surrounding the existing tourist information centre is located immediately adjacent to the 0.5% AEP flood extents. The flood extents plans showing the maximum flood levels for the 0.5% AEP + climate change and the 0.2% AEP events is presented in **Figure 10-2 in Appendix 10.1**.

Water Supplies

10.4.30 Information supplied by SEPA and West Dunbartonshire Council confirmed that there are no private water supplies or CAR licensed abstractions within the site.

10.4.31 SEPA confirmed that there are no abstractions from the River Leven, and no groundwater abstractions within 1km.

Wetlands

10.4.32 During the field survey undertaken to inform the ecological studies, it was noted that no GWDTEs were present on site. This is noted in **Chapter 5 – Ecology.**

Summary of Receptor Sensitivity

10.4.33 The sensitivity of identified water environment receptors to be considered in this assessment is detailed in **Table 10-4** below.

Table 10-4: Receptor Sensitivity

Receptor	Sensitivity	Rationale
Loch Lomond	High	International and national designations within and adjacent to the Loch. Used extensively for recreation.
Watercourses: River Leven and three unnamed watercourses	Medium	River Leven used for boating recreation and classified as Moderate Ecological Potential. Smaller watercourses not identified on RBMP.
Groundwater - Bedrock	Low	Bedrock: Moderate productivity aquifer with no identified abstractions within 1km proximity to site. Drift: Low productivity and very localised nature of present glaciofluvial deposits.

10.5 Baseline Evolution

10.5.1 In the absence of the proposed development, future baseline conditions would likely remain consistent with existing conditions on site.

10.5.2 Increasing climate change may however affect the hydrological cycles within the catchments surrounding the site, resulting in marginally higher flows and more extreme intense rainfall events, which may result in higher water levels with Loch Lomond and the River Leven, as described above. This however is a change which would be relatively consistent across Scotland and would not be limited to this site.

10.6 Embedded Mitigation

10.6.1 As detailed in **Chapter 2 – The Proposed Development**, a number of design features and embedded mitigation measures have been incorporated into the design and construction of the proposed development to avoid, prevent or minimise significant adverse environmental effects and to enhance beneficial effects. Embedded mitigation measures of relevance to this assessment are:

- No buildings within the functional floodplain and finished floor levels of buildings adjacent to the water bodies to be above the 1 in 200yr + climate change peak flood level;
- Avoid crossings of existing watercourse to prevent pollution; and,
- Development within a 5m strip along waterfronts will be subject to specific consideration within a CEMP to be agreed with the NPA prior to commencement.

10.6.2 The surface water drainage scheme for the proposed development will be designed in accordance with Sustainable Drainage Systems (SUDs) principles and such that the maximum discharge rate will be equivalent to the greenfield (i.e. pre-development) runoff rate.

10.6.3 Additional mitigation measures identified through the EIA process are detailed in **Section 10.8** below before likely residual effects from the proposed development are then stated in **Section 10.9**.

10.7 Assessment of Likely Effects

10.7.1 Potential effects on the water environment that could arise during the construction and post-completion phases of the proposed development are summarised in **Table 10-5** and are discussed further in the following sections.

Overview

10.7.2 The construction phase is the most important in terms of potential impacts on the water environment, with key activities including:

- Earthworks, including alteration of site ground levels;
- Excavation for foundations of properties and site infrastructure;
- Stockpiling of excavated materials;
- Creation of impermeable surfaces;
- Construction of new stormwater drainage system; and,
- Use and storage of oils and fuels.

10.7.3 During the operational phase, the most important potential impact is the potential change in surface water quality and volume of runoff, arising from increased impermeable surfaces, and associated downstream flood risk.

10.7.4 Watercourse crossings have the potential to impact upon the water environment in terms of flows within channels and sediment release during construction. There are however no watercourse crossings identified on the proposed masterplan, and so this has not been considered further.

Table 10-5: Summary of Potential Effects

Receptor	Potential Effect
Loch Lomond and Watercourses	Flow alterations (increased runoff/ alteration of flow paths, and associated flood risk).
	Increased pollution from sediments – within watercourses and locally within Loch Lomond.
	Pollution from chemicals.
Groundwater	Flow and level alterations (groundwater drawn down/ alteration of flow paths).
	Pollution from chemicals.

Construction Phase

Surface Water Flow Alterations and Flood Risk

10.7.5 During construction, existing drainage patterns and flow pathways would be altered by the introduction of impermeable surfaces, change in site ground levels and presence of stockpiles or foundation voids. Impermeable surfaces arising from the compaction of soils and construction of infrastructure would reduce infiltration and may lead to an increase in surface water runoff. The potential environmental impacts of this include increase in flow rates within the on-site or adjacent watercourses, potentially leading to increases in channel erosion, sediment transport and both on-site and downstream flood risk.

10.7.6 Potential surface water flow alterations are assessed as having a possible, short-term, moderate magnitude adverse impact on the identified watercourses and Loch Lomond (medium and high sensitivity receptors respectively).

Pollution from Sediments

10.7.7 There is the potential for increased release of fine sediment into watercourses and Loch Lomond arising from sediment-laden runoff from areas of soil stripping, earthworks and stockpiles.

10.7.8 Increased sediment loading to watercourses can degrade water quality and change substrate characteristics, which may affect the quality of the aquatic habitat. Sedimentation of watercourses can also have a detrimental effect on flow conveyance of the channel and downstream culverts, affecting flood risk.

10.7.9 Potential increased pollution from sediments would be short to medium term in duration and are assessed as having a likely, moderate magnitude adverse impact on Loch Lomond and the identified watercourses (high and medium sensitivity receptors respectively).

Pollution from Chemicals

10.7.10 During construction there is a risk of accidental pollution incidences affecting the water environment (watercourses, loch & groundwater) from the following sources:

- Spillage or leakage of oils and fuels:
- Stored on site;
- From construction machinery or site vehicles; and,
- From refuelling machinery on site.
- Spillage or leakage from on-site toilet facilities;
- Cement, concrete or grout getting polluting surface water or groundwater; and,
- Spillage or leakage from use or storage of other chemicals and hazardous substances.

10.7.11 Oil spillages to the water environment would be detrimental to water quality and could affect fauna and flora. Oils and fuels are hazardous (List 1) substances under the Groundwater and Priority Substances (Scotland) Regulations 2009 and their ingress to groundwater must be prevented. Groundwater vulnerability to pollutants may increase in areas where drift deposits are excavated, for example for foundations or alteration of site ground levels. Potential

contaminants could leak through fractures and cavities in the bedrock and affect groundwater quality.

10.7.12 Cement, concrete and grouts used for construction are highly alkaline and corrosive and can cause serious pollution to the ground and water environment. Water wildlife, such as invertebrates and fish, are very sensitive to changes in pH (acid/alkaline) levels.

10.7.13 Other chemicals and hazardous substances used and stored on site (e.g. cleaning products, solvents, and pesticides) could cause pollution if they enter surface waters or groundwater.

10.7.14 The potential impact of contaminant discharges on the identified receptors is likely to be short-term in nature. Potential contaminant discharges are assessed as having a possible, moderate magnitude adverse impact on Loch Lomond and identified watercourses (high and medium sensitivity receptors respectively), and groundwater (low sensitivity receptor).

Groundwater Flow and Level Alterations

10.7.15 Groundwater is expected to be at shallow depth in areas of lower ground. Excavations below groundwater level, for example for foundation construction, could lead to localised groundwater drawdown. Open excavations that cannot be drained by gravity may require dewatering. Groundwater pathways could also be altered by construction of foundations and road infrastructure.

10.7.16 The potential effect would be localised in extent and short-term in nature (duration of open excavation or dewatering). Groundwater flow and level alterations are assessed as having a likely, slight magnitude adverse impact on the underlying moderate productivity aquifers (low sensitivity receptor).

Operational Phase

Surface Water Flow Alterations and Flood Risk

10.7.17 Once the proposed development is completed and operational, in the absence of further mitigation, surface water runoff volumes would be increased due to the increase in impermeable area across the site, and surface water flow pathways would be altered by the drainage scheme. However as identified in **Section 10.6 - Embedded Mitigation**, the drainage scheme for the proposed development has been designed to attenuate runoff from impermeable areas within the development site to Greenfield (i.e. pre-development) rates. The discharge of flows from the site into the River Leven will be restricted so that is no increase in flood risk downstream.

10.7.18 Potential surface water flow alterations post-completion are assessed as having a likely, positive, long-term, negligible magnitude impact on Loch Lomond and the identified watercourses (high and medium sensitivity receptors respectively) and a negligible impact upon downstream flood risk.

Pollution from Sediment

10.7.19 Pollution from sediment may be reduced compared to baseline conditions due to the site SUDs scheme attenuating the sediment content in runoff from the development. Potential increased pollution from sediments are assessed as having an unlikely, long term, slight magnitude adverse impact on Loch Lomond (high sensitivity receptor) and identified watercourses (medium sensitivity receptor).

Pollution from Chemicals

10.7.20 During the operational phase of the proposed development, oils and fuels within surface runoff from roads will be the main potential source of contaminant discharges. The SUDs scheme for the proposed development will include treatment of runoff in accordance with published standards and guidance. Increased contaminant discharges are therefore assessed as having an unlikely, short-term, slight magnitude impact on Loch Lomond (high sensitivity), watercourses (medium sensitivity receptor) and groundwater (low sensitivity).

Groundwater Flow and Level Alterations

10.7.21 During the operational phase, the on-going impact of the proposed development on groundwater flow and levels would be negligible due to the nature of the development and no anticipated disturbance of the ground.

10.7.22 The proposed development is assessed as having a possible, long term, negligible magnitude impact on groundwater levels (low sensitivity receptor).

10.8 Further Mitigation and Enhancement

10.8.1 The assessment of potential effects from the proposed development in **Section 10.7** indicates that in the absence of further mitigation, a number of significant adverse effects on the water environment would be likely. To address this and minimise the likelihood of significant adverse effects arising, as well as to maximise environmental opportunities from the proposed development, further mitigation and enhancement measures are proposed below. These are then taken into account in the assessment of residual effects provided in **Section10.9**.

10.8.2 The proposed further mitigation and enhancement is grouped into the following areas:

Construction Phase

Further Mitigation to be Included Within CEMP

10.8.3 As noted in **Section 10.6**, the commitment to develop and implement a CEMP for the construction phase of the proposed development is treated an embedded mitigation measure, as are the provision of certain standard information and environmental management measures within the CEMP (refer to **Section 10.6**). Over and above this, the assessment in this ES chapter has identified the need for the following further mitigation measures to also be detailed within and implemented through the CEMP:

- Any construction activities within a 5m strip along waterfronts will be subject to specific consideration within the CEMP to be agreed with the National Park Authority (NPA) prior to commencement;
- An Environmental Clerk of Works (ECoW) will ensure that the CEMP and associated mitigation measures are implemented effectively; and,
- A pollution prevention and response plan will be set out in the CEMP. This will provide site spill response procedures, emergency contact details and equipment inventories and their location. All staff will be made aware of this document and its content during site induction. A copy will be available in the site office at all times.

Surface Water Management

10.8.4 Surface water drainage arrangements for the construction phase will be in line with SUDs principles, incorporating appropriate treatment and attenuation prior to discharge to the water environment in accordance with the required CAR authorisation and relevant GBR. It is proposed to replicate natural drainage around construction areas and to use source control to manage rainfall where, or adjacent to where, it lands.

10.8.5 The implementation of a given SUDs measure will be dependent upon detailed site and hydrological investigations. Detailed surface water drainage proposals and methodology for the construction phase will be detailed within a Pollution Prevention Plan (PPP) which will be included within the CEMP as noted above. The SUDs features will be installed prior to the main construction activities (including removal of vegetation and any earthworks). Suitable measures will be in place at all times for treatment of runoff from construction areas, to prevent the release of pollutants including sediment to adjacent surface water features.

10.8.6 Clean runoff from vegetated areas or offsite will be kept clean and diverted around works to prevent mixing with silt-laden water.

10.8.7 Surface water management measures employed during the construction phase should be regularly inspected and maintained to check that they are working effectively and that there are no blockages or unexpected discharges.

10.8.8 The risk of oil contamination will be minimised by good site working practice (further described below) but should a higher risk of oil contamination be identified then an oil separator will be considered.

10.8.9 A minimum buffer zone of 5m will be maintained along the waterfronts. No construction activities will take place within this buffer zone, including movement of construction machinery, stockpiling

and construction of SUDs features unless they have been specifically considered and allowed within the CEMP.

10.8.10 Routing of construction discharges should ideally be through at least three levels of SUDs to ensure that water quality of high sensitivity receptors is not adversely affected.

Earthworks

10.8.11 Areas stripped of earth and vegetation will be kept to a minimum at any one time – this is in accordance with the GBR11 of CAR. Soil loss and erosion will be minimised through careful storage, reinstatement and re-vegetation. Stockpiles will be placed in areas of minimal risk of slippage or erosion from drainage and will not be located within 20m of any watercourses or ditches.

10.8.12 Any runoff from earthworks and stockpiles will be passed through appropriate construction SUDs measures prior to discharge to the water environment.

10.8.13 The time excavations are kept open for will be kept to a minimum to avoid ingress of water, minimise erosion and the need for dewatering. Drainage or pumping from excavations will be minimised through appropriate design. Temporary cut-off drains will be installed if required to prevent surface water runoff entering excavations.

10.8.14 Any dewatering will comply with GBR2 and GBR5. If abstraction exceeds $10m^3$ per day a CAR registration or licence will be required, which will be obtained prior to the commencement of the abstraction. Any water pumped out of excavations will be treated by passing through a SUDs feature prior to discharge to the water environment.

Construction Tracks

10.8.15 Access tracks used during construction (i.e. not the final road layout) will incorporate appropriate drainage measures including ditches, camber to shed water to the edges, frequent cross drains and trackside grips/offlets to prevent the tracks acting as a preferential drainage route and to protect the water environment. Any trackside discharge will be passed through appropriate construction SUDs measures prior to discharge to the water environment. Water will not be allowed or encouraged to pond in the track where possible.

Oils, Fuels, Site Vehicles and Welfare Facilities

10.8.16 The mitigation measures to minimise risk of contaminant release will be in line with the Controlled Activities (Scotland) Regulations which came into force on 1st January 2018. These General Binding Rules (GBRs) consolidate the provisions of the Water Environment (Oil Storage) (Scotland) Regulations 2006 into CAR and extend the application of those provisions. Mitigation measures will follow these GBRs. The relevant PPGs will also be used to guide the embedded mitigation. This includes the following:

- Storage of oil and fuels on site will be designed to be compliant with GBRs 26-28 and any bunds will provide storage of at least 110% of the largest tank's maximum capacity;
- The storage of oil in a portable container with a capacity of greater than 200 litres on site will not be permitted;
- Multiple spill kits will be kept on site;
- Drip trays will be used while refuelling; and,
- Regular inspection and maintenance of vehicles, tanks and bunds will be undertaken.

10.8.17 Welfare facilities will include closed-system toilets, with disposal of foul drainage at a suitable off-site facility.

10.8.18 Concrete and cement mixing will be sited on an impermeable designated area and at least 10m away from a watercourse or surface water drain, to reduce the risk of run-off entering a watercourse. Equipment will be washed out in a designated area, specifically designed to contain wet concrete and wash water. Wash waters will be discharged to the foul sewer with prior permission from Scottish Water or disposed off-site at an authorised facility.

10.8.19 All chemicals and hazardous substances will be stored safely, away from watercourses and drains in line with current best practice. They will be disposed of in line with duty of care requirements.

Operational Phase

10.8.20 The proposed surface water and SUDs scheme (see **Section 10.6**) will require regular maintenance during its operational life. This maintenance will include the regular debris clearing and cutting of grass of surface SUDs features, and the inspection and repairs to underground features if necessary. The responsibility for the maintenance of the drainage network will lie with the organisation that adopts the network. Details of the proposed drainage strategy for the site are covered in **Appendix 10.3**.

10.8.21 During the operational phase there should be no requirement for groundworks. However, should groundworks be required mitigation highlighted in the construction sections above will be adopted as appropriate.

10.9 Residual Effects

10.9.1 As shown in **Table 10-6**, the influence of the further mitigation identified in **Section 10.8** means that with one exception (effects on groundwater flow) the level of predicted effects would reduce such that the residual effect would become Negligible and not significant in the context of the EIA Regulations. The rationale for the predicted level (and thus significance) of effects on groundwater flow is provided in **Section 10.7.15**.

Table 10-6: Summary of Likely Residual Effects

Potential Impact	Receptor, Sensitivity	Source of Impact	Type of Effect	Duration	Probability of Effect Occurring on Receptor	Pre-Mitigation Magnitude of Change	Pre-Mitigation Level of Effect	Post Mitigation Magnitude of Impact	Residual Significance of Effect	Residual Effect Significance
	Construction Phase									
Surface water flow alterations and flood risk	Loch Lomond, High	Impermeable surfaces, change in site levels, stockpiles, voids	Negative	Short	Possible	Moderate	Major	Negligible	Negligible	Not Significant
	Watercourses, Medium		Negative	Short	Possible	Moderate	Moderate	Negligible	Negligible	Not Significant
Pollution from sediments	Loch Lomond, High	Soil stripping, earthworks, stockpiles	Negative	Short – medium	Likely	Moderate	Major	Negligible	Negligible	Not Significant
	Watercourses, Medium		Negative	Short – medium	Likely	Moderate	Moderate	Negligible	Negligible	Not Significant
Pollution from chemicals	Loch Lomond, High	Oils, fuels, machinery, welfare facilities	Negative	Short	Possible	Moderate	Major	Negligible	Negligible	Not Significant
	Watercourses, Medium		Negative	Short	Possible	Moderate	Moderate	Negligible	Negligible	Not Significant
	Groundwater, Low		Negative	Short	Possible	Moderate	Minor	Negligible	Negligible	Not Significant
Groundwater flow and level alterations	Groundwater, Low	Excavations and dewatering	Negative	Short	Likely	Slight	Minor	Low	Minor	Not Significant
	Operational Phase									
Downstream & on-site flood risk	Loch Lomond, Medium	Impermeable surfaces, drainage system	Positive	Long	Likely	Negligible	Negligible	Negligible	Negligible	Not Significant
	Watercourses, Medium		Positive	Long	Likely	Negligible	Negligible	Negligible	Negligible	Not Significant
Pollution from sediments	Loch Lomond, High	Increased runoff from impermeable surfaces, roads	Negative	Long	Unlikely	Low	Moderate	Negligible	Negligible	Not Significant
	Watercourses, Medium		Negative	Long	Unlikely	Low	Minor	Negligible	Negligible	Not Significant
Pollution from chemicals	Loch Lomond, High	Vehicle use	Negative	Short	Unlikely	Low	Moderate	Negligible	Negligible	Not Significant

Potential Impact	Receptor, Sensitivity	Source of Impact	Type of Effect	Duration	Probability of Effect Occurring on Receptor	Pre-Mitigation Magnitude of Change	Pre-Mitigation Level of Effect	Post Mitigation Magnitude of Impact	Residual Significance of Effect	Residual Effect Significance
	Watercourses, Medium		Negative	Short	Unlikely	Low	Minor	Negligible	Negligible	Not Significant
	Groundwater, Low		Negative	Short	Unlikely	Low	Minor	Negligible	Negligible	Not Significant
Groundwater flow and level alterations	Groundwater, Low	Built infrastructure	Negative	Long	Possible	Negligible	Negligible	Negligible	Negligible	Not Significant

10.10 Monitoring

10.10.1 In the absence of any likely significant adverse effects, no monitoring is considered to be proportionate or required.

10.11 Cumulative Effects

10.11.1 Cumulative effects on the water environment could occur where more than one development is proposed within a catchment, and **Chapter 2 – Site and Proposed Development** identified the relevant cumulative developments within the area.

10.11.2 The relevant cumulative developments are:

- Replacement building and infrastructure for Sweeney's Cruises;
- Replace fixed jetties providing 50 moorings with floating pontoons providing 48 moorings for Riverside Leisure Ltd;
- Lomond Hotel Alterations and Extension;
- Woodbank Inn Hotel Extension; and,
- Balloch Street Design Project.

10.11.3 With reference to impact upon the water environment, it is not considered that any cumulative development listed above would have any impact. As such there would be negligible/no cumulative effects on the water environment.

10.12 Summary

10.12.1 This chapter of the EIAR has assessed the impact of the proposed development upon the water environment which includes surface water and fluvial hydrology (including flooding), water quality, drainage, groundwater, water supplies and wetlands.

10.12.2 A suite of embedded and further mitigation has been proposed to avoid, prevent and minimise likely significant effects on the water environment. This includes:

- A buffer for construction activities within a 5m strip along waterfronts;
- Adherence to relevant national guidance, legislation and good practice in construction methods;
- Development and adhering to a Construction Environmental Management Plan (CEMP) containing a Pollution Prevention Plan (PPP), which will include monitoring of the site activities to ensure compliance;
- The use of construction phase Sustainable Drainage Systems (SUDs);
- An Environmental Clerk of Works (ECoW) will supervise the construction works to ensure compliance with the above;
- Permanent surface water drainage network incorporating SUDs to ensure sufficient levels of treatment and attenuation of surface water discharges from site;
- All proposed development is to be located outwith the functional floodplain as identified in the Flood Risk Assessment, and the minimum finished floor levels of buildings on site are to be above the maximum flood level estimated for the 1 in 200 year + climate change event; and,
- Routing of construction discharges through at least three levels of SUDs to ensure that water quality of high sensitivity receptors is not adversely affected.

10.12.3 With the above mitigation measures in place, the assessment has concluded that the proposed development would not generate any significant effects upon the water environment.

10.13 References

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11 Landscape & Visual

11.1 Introduction

11.1.1 This chapter of the EIAR provides an assessment of the likely significant effects of the proposed development on landscape as an environmental resource and on people's views. The landscape and visual impact assessment (LVIA) is based on the characteristics of the site and surrounding area and the key parameters of the proposed development detailed in **Chapter 2 – Site and Proposed Development**.

11.1.2 This chapter has been prepared by Gillespies. In line with best practice, a statement outlining the relevant expertise and qualifications of competent experts appointed to prepare this chapter is provided in **Appendix 1.1**.

11.1.3 This chapter is supported by the following figures and technical reports provided in **Appendices 11.1 – 11.5**:

- Appendix **11.1 – Figures** includes:
  - **Figure 11-1**: Site Location and Study Area;
  - **Figure 11-2**: Topography;
  - **Figure 11-3a**: Station Square Development ZTV;
  - **Figure 11-3b**: Riverbank Development ZTV;
  - **Figure 11-3c**: Pierhead Development ZTV;
  - **Figure 11-3d**: Boathouse and Staff Area Development ZTV;
  - **Figure 11-3e**: Woodbank Development ZTV;
  - **Figure 11-4**: Landscape Character Types;
  - **Figure 11-5**: Designations;
  - **Figure 11-6**: Recreational Features;
  - **Figure 11-7**: Viewpoint Plan Construction; and,
  - **Figure 11-8**: Viewpoint Plan Operation.
- **Appendix 11.2 – Methodology:** includes the methods used to determine the baseline conditions, the sensitivity of the landscape and visual receptors and the predicted magnitude of change and sets out the approach to judging the level and significance of likely landscape and visual effects.
- **Appendix 11.3 – Landscape Character Assessment**: includes an assessment of the effects of the proposed development on the Loch Lomond and the Trossachs National Park (including its special qualities) and on three of the Landscape Character Types (LCTs), identified in the NatureScot digital map-based Landscape Character Assessment (2019).
- **Appendix 11.4 – Viewpoint Assessment**: includes an assessment of the effects of the proposed development on a series of representative viewpoints within the 5km study area.
- **Appendix 11.5 – Visualisations**: includes a series of post-construction visualisations for each of the representative viewpoints, produced in accordance with the Landscape Institute guidance.

Policy Context, Legislation, Guidance and Standards

Legislation

11.1.4 The overarching legislative framework applicable to this EIA for the proposed development is outlined in **Chapter 4 – Legislative and Policy Context**. Over and above this there are no statutory provisions of specific relevance to this assessment.

Policy

11.1.5 The planning policy framework applicable to this EIA for the proposed development is outlined in **Chapter 4 – Legislative and Policy Context**. The statutory Development Plans applicable to the site and the study area presently comprise the following.

Loch Lomond and the Trossachs National Park Local Development Plan 2017 – 2021

11.1.6 The adopted Loch Lomond and the Trossachs National Park Local Development Plan 2017 – 2021 (LLTTNP LDP)11. Although dated 2017 – 2021, because of the Covid-19 pandemic, the current plan will remain in place until 2024.

11.1.7 Planning policy considerations of specific relevance to this assessment are:

- Natural Environment Policy 1 – National Park Landscapes, Seascape and Visual Impact;
- Natural Environment Policy 8 – Development Impacts on Trees and Woodlands;
- Natural Environment Policy 9 – Woodlands on or adjacent to Development Sites;
- Historic Environment Policy 3 – Wider Built Environment and Cultural Heritage; and,
- Historic Environment Policy 4 – Gardens and Designed Landscapes.

National Park Partnership Plan 2018 – 2023

11.1.8 Also of relevance is the overarching vision for the management of the National Park set out in the National Park Partnership Plan 2018 – 202312, particularly Outcome 2: Landscape Qualities.

West Dunbartonshire Local Development Plan

11.1.9 West Dunbartonshire Local Development Plan 2 (2020)13.

11.1.10 Planning policy considerations of specific relevance to this assessment are:

- Policy KH1 – Kilpatrick Hills;
- Policy BE4 – Gardens and Designed Landscapes; and,
- Policy ENV2 – Landscape Character.

11.2 Methodology

Overview

Assessment Scope

11.2.1 The assessment of landscape effects considers physical changes to the landscape as well as changes in landscape character. It also considers changes to areas designated for their scenic or landscape qualities.

11.2.2 The assessment of visual effects focuses on public views experienced by those groups of people who are likely to be most sensitive to change arising from the proposed development. These include:

- Local communities (where views contribute to the landscape setting enjoyed by residents in the area);
- People using recreational routes including scenic roads, public rights of way and cycle routes; and,
- People visiting recreational features and attractions (some of which may have historic or cultural heritage importance).

[11] Loch Lomond and the Trossachs National Park Authority (2016), Loch Lomond and the Trossachs National Park Local Development Plan 2017 – 2024

[12] Loch Lomond and The Trossachs National Park Authority (2018), National Park Partnership Plan, 2018 - 2023

[13] West Dunbartonshire Council (2020), West Dunbartonshire Local Development Plan 2

11.2.3 Potentially significant landscape and visual effects (including cumulative effects) are identified, including those relating to construction and operation.

11.2.4 At the request of the National Park's Natural Heritage Planning Officer, a key consideration of this assessment was the need to understand how the Special Landscape Qualities (Special Qualities)14 of the National Park are experienced and how they may be affected by the proposed development. This included both the general qualities of the Park and the area-based qualities of Loch Lomond South. Special Qualities are linked to the type, range and composition of the physical components of the landscape, as well as to the less tangible experiential aspects of landscape as recognised and valued by people. Special Qualities do not necessarily have to be rare qualities but may simply be what makes an area important and valued.

Assessment Process

11.2.5 The approach and methodology presented in **Appendix 11.2** and used in the preparation of this landscape and visual impact assessment (LVIA) is based on guidance provided in the Guidelines for Landscape and Visual Impact Assessment Third Edition (GLVIA3)15.

11.2.6 GLVIA3 is the established best practice guidance for landscape and visual impact assessment.

11.2.7 In undertaking the assessment presented in this ES chapter, the following activities were carried out:

Consultation

EIA Screening and Scoping

11.2.8 Consultation was carried out with LLTTNP to agree the approach to the LVIA and the viewpoint locations. **Table 11-1** summarises the consultations undertaken to date which informed the assessment.

Table 11-1: Consultation Undertaken to Date

Consultee	Contact/ Date	Summary of Issues Raised/ Agreed
LLTTNP Caroline Strugnell (Development Management Planner)	27/07/21	Scoping Opinion - comments received LLTTNP Ref. No. PSC/2021/0005 LLTTNP requested a full Landscape and Visual Impact Assessment - prepared in accordance with GLVIA3 (2013). Reference should also be made to 'The Special Landscape Qualities of Loch Lomond and the Trossachs National Park (2010)'. LLTTNP noted that the Special Landscape Qualities apply to the National Park in its entirety and are not restricted to National Scenic Areas (NSAs). Both the general Special Landscape Qualities, which apply to the entire National Park, and those which are specific to Loch Lomond South need to be considered in the assessment. LLTTNP noted that the assessment associated with the 2018 application identified 21 viewpoints as representative of potential effects on landscape character and visual amenity. The viewpoint used previously for Balloch Country Park was not the most representative of potential landscape and visual effects and a revised viewpoint location should be selected in consultation with the National Park's Natural Heritage Planning Officer. The Zones of Theoretical Visibility (ZTVs) prepared for the proposed development clearly show potential visibility from Loch Lomond. Therefore, additional viewpoints should be identified from the loch in addition to the viewpoint from Inchmurrin

[14] Scottish Natural Heritage and Loch Lomond and The Trossachs National Park Authority (2010), *The special landscape qualities of the Loch Lomond and The Trossachs National Park*, Scottish Natural Heritage Commissioned Report, No.376 (iBids and Project no 648)

[15] Landscape Institute and Institute of Environmental Management & Assessment (2013), *Guidelines for Landscape and Visual Impact Assessment, 3rd Ed*. Routledge, London

Consultee	Contact/ Date	Summary of Issues Raised/ Agreed
		Island. Viewpoints from the loch should also include the potential landscape and visual effects of the proposed boat house area. LLTTNP requested photomontages of summer and winter views. There should be liaison with the National Park over finalising viewpoints and as much detail as possible should be provided in the photomontages as opposed to massing studies. The likely significant effect on landscape and visual amenity from loss of vegetation necessary for development and construction is important for a realistic assessment. LLTTNP requested a lighting management plan to be produced using guidelines from the Institute of Professional Engineers - https://theilp.org.uk/publication/guidance-note-1-for-the-reduction-of-obtrusive-light-2021/ This should include for construction and also the proposed operational development. This will form part of any detailed submission. LLTTNP requested that all landscaping proposed as mitigation should include a predominance of native species and consider habitat connectivity and 'habitat stepping stones'.

Table 11-2: Post Scoping Consultation

Consultee	Contact/ Date	Summary of Issues Raised/ Agreed
LLTTNP - Fiona Stewart (Natural Heritage Planning Officer)	16/12/21	LLTTNP raised concerns about the development along Pierhead Road and requested careful consideration of the edge-of-road treatment. LLTTNP requested that the walkway close to the river be of low-key design, noting that there are many self-seeded trees along the river which will need some management. LLTTNP requested hard copies of all the final visualisations.
LLTTNP - Fiona Stewart	08/12/22	LLTTNP provided a sketch showing an approximate area from where to take winter viewpoint photographs from the loch. The final locations, to be decided on site should take account of kayakers, boat tours and those launching from the Duncan Mills Centre, leaving the Marina etc.
LLTTNP - Fiona Stewart	16/11/22 09/11/21 17/09/21 15/09/21	Several conversations and emails were exchanged regarding the selection of viewpoints and whether any changes were required since the 2018 planning application. The following is a list of the viewpoint locations and requirements agreed with LLTTNP. The numbers are those used in the original planning application, hence there are references to 'photo. not required': ▪ VP01: Ben Lomond Way – AVR Level 1 ▪ VP02: Loch Lomond Shores – AVR Level 2 ▪ VP03: Maid of the Loch – AVR Level 2 (from slipway) ▪ VP04: Woodbank House – AVR Level 1 ▪ VP05: Old Luss Road SE – AVR Level 1 ▪ VP06: Old Luss Road W – AVR Level 1 ▪ VP06: Old Luss Road N – not required ▪ VP07: Inchcruin W & N – not required ▪ VP08 John Muir Way SW – not required ▪ VP08 John Muir Way NW – AVR1 ▪ VP09: Pier Road South – AVR1 (closer to Balloch Road than original) ▪ VP10: Balloch Road Bridge – AVR1 (ideally AVR2 if info. available) ▪ VP11: Balloch Bridge – not required ▪ VP12: Upper Stoneymollan – AVR1 ▪ VP13: Roundabout at Laudervale Gardens NW – basic VP with indicative dashed red line to show proposed development ▪ VP13b: Roundabout at Laudervale Gardens NE – photo. to demonstrate no view ▪ VP14: Boathouse Marina – AVR Level 1 (new location from end of jetty – winter view only)

Consultee	Contact/ Date	Summary of Issues Raised/ Agreed
		▪ VP15: Proposal Beach in Balloch Country Park – AVR Level 1 (new location from original) ▪ VP16: North West of Balloch – not required ▪ VP17: Balloch Castle – AVR Level 1 (slightly better location showing more of the loch shore) ▪ VP18: Drumbain Road – not required ▪ VP19: The Cruin Restaurant near Arden House – summer photograph from jetty to demonstrate no view ▪ VP20: Inchmurrin Island – not required ▪ VP21: Shantron Hill – summer photograph to demonstrate no view ▪ VP 22: Footpath leading up to Balloch Castle – summer/ winter photograph to demonstrate no view ▪ VP 23: Footpath leading up to Balloch Castle - AVR Level 1 ▪ VP 24: Footpath leading up to Balloch Castle - AVR Level 1 ▪ VP 25: - View from Loch – AVR level 2 ▪ VP 26: - View from Loch – AVR level 2
LLTTNP - Fiona Stewart	18/10/22	ADS provided summer viewpoint photographs and an accompanying location plan for comment. ADS explained it wasn't possible to get to Inchmurrin Island due to difficulties with transport and weather. As a result, LLTTNP agreed the Inchmurrin Island viewpoint was not required.
LLTTNP - Fiona Stewart	21/09/22	LLTTNP agreed that drones could be used to take photographs from Inchmurrin Island and the loch - assuming the resultant images would represent the view from eye level.
LLTTNP - Fiona Stewart	17/09/21	LLTTNP emphasised the importance of the viewpoints from the loch given the value of the loch fringe to the landscape character of the area. The images should therefore include the whole bay so that the area is not assessed in isolation.
LLTTNP - Fiona Stewart	15/09/21	LLTTNP agreed that Type 3 visualisations were acceptable for all the viewpoints/ visualisations. GPS locations with co-ordinates were also acceptable so a surveyor was not needed. LLTTNP requested summer and winter photographs/ images. LLTTNP requested good images of the proposed planting style around Station Square as this is the gateway to the Highlands (i.e. not too urban in appearance). LLTTNP wished to see all the proposed shoreline development use a palette of materials sympathetic to the rural location. The height of the development was still a concern and the need for a sympathetic roof treatment on the apart-hotel was emphasised as it will potentially be noticeable in elevated views such as from Upper Stoneymollan. LLTTNP had concerns about the width of the existing footpath between the proposed development and Lomond Shores as they do not wish to see this footpath hemmed in by buildings. Also, the existing white pontoon is not to be used as a precedent for any shoreline proposals as this is soon to be painted a darker colour at the request of Park Authority. LLTTNP emphasised that views from John Muir Way and the bridge over the river are very important as this is the first introduction to the National Park for visitors and an ideal opportunity to develop a gateway focal point using planting and materials in keeping with the locality and not urban in style.

Study Area

11.2.9 The Study Area for the LVIA, which is shown in **Figure 11-1**, extends to a distance of 5km from the boundary of the site. This distance was determined by the nature of the surrounding environment, and by the physical scale of the proposals and the likely distance over which they would be sufficiently visible to give rise to significant effects. It was also informed by the production of the following Zone of Theoretical Visibility (ZTV) plans:

- **Figure 11-3a** – ZTV of the Station Square development, notably the three-storey apart-hotel (Zone A: Station Square in the Parameters Plan in **Appendix 2.1**);
- **Figure 11-3b** – ZTV of the Riverfront development (Zone B: Riverfront in the Parameters Plan in **Appendix 2.1**);
- **Figure 11-3c** – ZTV of the Pierhead development (Zone C: Pierhead in the Parameters Plan in **Appendix 2.1**); and,
- **Figure 11-3d** – ZTV of the proposed boathouse on the site of the former Woodbank House boathouse (this relates to a single location in Zone D: Boathouse and Staff Area in the Parameters Plan in **Appendix 2.1**).
- **Figure 11-3e** – ZTV of the Woodbank development (Zone E: Riverfront in the Parameters Plan in **Appendix 2.1**).

11.2.10 The ZTVs are based on a bare earth Digital Terrain Model (DTM) provided by the project architects. ZTVs are a useful tool to assist in determining the extent of the study area and identifying the key visual receptors and viewpoints. It should, however, be noted that there will be areas shown within the ZTV which may have views of the proposed development obscured by features such as buildings, trees and fences, which are not captured by the DTM data.

11.2.11 It should be further noted that the tallest building at Pierhead (the apart-hotel) will be approximately 10.5m tall. From 1km away in clear visibility, a vertical structure 10.5m tall will be perceived to be approximately 0.65cm in height16, which is highly unlikely to give rise to significant landscape or visual effects, even across the open water of the loch.

Information Sources

Desk Top Study

11.2.12 In addition to GLVIA3, the following documents were used for particular aspects of the assessment:

- Landscape Institute (2019), Technical Guidance Note TGN 06/19: Visual Representation of Development Proposals17;
- NatureScot, (2020), Draft Landscape Sensitivity Guidance18;
- NatureScot digital map-based Landscape Character Assessment (published in 2019)19;
- NatureScot (2019), Landscape Character Assessment: Loch Lomond and The Trossachs20;
- Scottish Natural Heritage and Loch Lomond and The Trossachs National Park Authority (2010), The special landscape qualities of the Loch Lomond and The Trossachs National Park21; and,
- Kilpatrick Hills Local Landscape Area Statement of Importance22.

[16] Gillespies LLP (2014), *Wind Turbines and Pylons: Guidance on the Application of Separation Distances from Residential Properties*. Report prepared for Gwynedd Council, isle of Anglesey County Council and Snowdonia National Park.

[17] Landscape Institute (2019), *TGN 06/19: Visual Representation of Development Proposals*

[18] NatureScot (2020), *Draft Landscape Sensitivity Assessment Guidance*

[19] NatureScot (2019), *Scottish Landscape Character Types and Descriptions*, available online at https://www.nature.scot/professional-advice/landscape/landscape-character-assessment/scottish-landscape-character-types-map-and-descriptions

[20] NatureScot (2019), *Landscape Character Assessment – Loch Lomond and the Trossachs Landscape Evolution and Influences*

[21] Scottish Natural Heritage and Loch Lomond and The Trossachs National Park Authority (2010), *The special landscape qualities of the Loch Lomond and The Trossachs National Park*, Scottish Natural Heritage Commissioned Report, No.376 (iBids and Project no 648)

[22] West Dunbartonshire Council (2015), *Kilpatrick Hills Local Landscape Area Statement of Importance*

11.2.13 Where existing information was used, this was verified on site to ensure that the information was accurate and appropriate for the purposes of the landscape and visual assessment. The extent of the study area and viewpoint locations were also confirmed on site.

11.2.14 The data sources used for the desk-top assessment included the following:

- Base mapping from ArcGIS Map Service;
- Mid-resolution height data – digital terrain model (DTM); and,
- Google Earth Pro aerial photography.

Fieldwork

11.2.15 Field surveys were originally undertaken in 2017/ 2018 to support the 2018 planning application. The information gained from these was supplemented by further surveys undertaken in summer and winter 2021. The purpose of these surveys was to gain an understanding and appreciation of the landscape, including the Special Qualities of the National Park and the landscape character across the study area, to undertake the viewpoint survey, and to understand the likely effects of the proposed development. Field notes and photographs were taken. At the time of the surveys the weather was dry with good visibility.

Approach to Assessment

11.2.16 The approach and methodology are presented in **Appendix 11.2**. This includes an explanation of how the value and susceptibility to change of each receptor was established, how the magnitude of effect was assessed and how the overall level and direction of effect was predicted, based on a combination of value, susceptibility and magnitude of effect.

11.2.17 Throughout the assessment process, ongoing involvement with the masterplanning design process continued. This was to ensure that potentially significant adverse effects, which could be avoided or reduced, were designed out.

Baseline

11.2.18 The existing nature of the landscape and visual environment in and around the study area formed the basis for the impact assessment and was informed through desktop analysis and site survey. It included the following:

- A review of landscape planning designations and policy;
- An understanding of the site in the wider study area: its constituent elements and features; its character and the way that this varies spatially; any designations which apply to it; its condition; the way that it is experienced; and the value attached to it; and,
- An understanding of the areas from which the proposed development may be visible, the different groups of people (visual receptors) who may be affected and their susceptibility to changes in their view, the places that would be affected and the nature (value) of the views and visual amenity currently experienced at those locations.

11.2.19 The above was undertaken through a combination of desk-study and field observation.

11.2.20 The LVIA considers operational effects at year 1 and year 15 at which time the tree planting will typically be around 7 – 10m high (depending on species and location).

11.2.21 For the purposes of the visual assessment, distances are defined as follows:

- Close or near distance view (0 -100 m);
- Middle distance view (100 -1000 m); and
- Long or distant view (1 km or more).

Landscape Character Assessment

11.2.22 An initial screening assessment was undertaken of the potential effect of the proposed development on the key characteristics and overall character of the landscape based on the LCTs described in the NatureScot digital map-based Landscape Character Assessment (2019). This exercise, which is presented later in this chapter, was used to identify LCTs with the potential to experience significant effects from the proposed development. These were then carried forward into the landscape character assessment presented in **Appendix 11.3**.

Viewpoint Assessment

11.2.23 An examination of the study area and ZTVs (backed up by site survey) was used to identify a series of publicly accessible locations with views towards the site. The selected locations (referred to as 'viewpoints') were not intended to illustrate every possible location from where there might be a view of the proposed development, but rather to present a selection of representative, specific and illustrative views to inform decisions about the proposed development's likely landscape and, in particular, visual effects. No access to private properties was sought.

11.2.24 Viewpoints were selected in consultation with the LLTTNP's Natural Heritage Planning Officer to represent the following range of receptors and views:

> *'Representative viewpoints, selected to represent the experience of different types of visual receptor, where larger numbers of viewpoints cannot all be included individually and where the significant effects are unlikely to differ - for example, certain points may be chosen to represent the views of users of particular public footpaths and bridleways;*
>
> *Specific viewpoints, chosen because they are key and sometimes promoted viewpoints within the landscape, including for example specific local visitor attractions, viewpoints in areas of particularly noteworthy visual and/or recreational amenity such as landscapes with statutory landscape designations, or viewpoints with particular cultural landscape associations; and,*
>
> *Illustrative viewpoints, chosen specifically to demonstrate a particular effect or specific issues, which might, for example, be the restricted visibility at certain locations'. (GLVIA3 Paragraph 6.19).*

11.2.25 It was agreed with LLTTNP's Natural Heritage Planning Officer that, as the design of the proposed development has altered substantially since the original planning application in 2018, some of the original viewpoint locations were not required. To avoid confusion, however, the numbering of viewpoint locations has been kept the same as in the original LVIA, which means that some viewpoint numbers are not accompanied by an assessment. These are recorded in the **Visual Assessment in Appendix 11.4** as 'VP number not used'.

General Site Photography

11.2.26 For each of the agreed viewpoints, high resolution GPS located photographs were taken in accordance with TGN 06/19. The resulting images were merged together using specialist software to create panoramic views and presented within the **Viewpoint Assessment in Appendix 11.4**.

Accurate Visual Representations

11.2.27 To support the LVIA and demonstrate the likely visibility of the proposed development from various representative locations, a series of visualisations showing summer and winter views were produced by specialist company ADS Ltd. These cover the viewpoints agreed with the National Park Authority and are included in **Appendix 11.5**, which also includes the approach and methodology.

Cumulative Effects Assessment

11.2.28 The cumulative visual impact assessment focused on the additional cumulative change which may result from the introduction of the proposed development, when considered alongside other cumulative schemes in the area. The objective of the assessment was to identify whether impacts from several developments, which individually might be insignificant, could cumulatively result in a significant effect upon visual receptors.

11.2.29 The list of committed developments for inclusion within the cumulative assessment is presented in **Tables 2-2** and **2-3** in **Chapter 2 – Site and Proposed Development**.

11.2.30 There are only two developments likely to give rise to cumulative landscape and visual effects is Sweeney Cruises proposal (LLTTNP Application Number 2017/0373/DET) to erect 3 no. buildings (two storey office building, slipway enclosure/ workshop building, boathouse with storage level above and installation of two pontoons). This was granted planning consent in August 2018), but construction works (as of March 2022) have not commenced.

11.2.31 The other development is the proposed enhancement of the John Muir Way. This includes a range of measures, which are identified in the John Muir Way Greening Study (2021) produced by the Green Action Trust, including installation of a cantilevered boardwalk and softening of the shoreline around the Loch Lomond Shores development through the establishment of native waterside vegetation. The project is still at the scoping stage but has been included in the cumulative assessment.

11.2.32 The cumulative assessment excluded existing operational developments and schemes currently under construction and due to be completed prior to the completion of the proposed development. This is because these were accounted for in the baseline and future baseline conditions which were established as part of the main LVIA.

11.2.33 The approach to assessing the level of importance and potential significance of cumulative landscape or visual effects used the same principles as the approach to the LVIA set out in the methodology in **Appendix 11.2**.

11.3 Baseline

11.3.1 The first stage in the LVIA was to establish the existing nature of the landscape and visual environment in the study area, including any relevant changes likely to occur independently of the proposed development. This information formed the basis for the subsequent assessment. It included the following:

- A review of policy context, legislation, guidance and standards relevant to landscape (see Section 11.2 above);
- An understanding of the landscape across the study area - its constituent elements, its character and the way that this varies spatially, its geographic extent, its historical features, condition, the way that it is perceived, and the value attached to it; and,
- An understanding of the areas from which the proposed development may be visible, the different groups of people (visual receptors) who may be affected and the nature of the views and visual amenity currently experienced at those locations.

11.3.2 The appraisal was undertaken through a combination of desk-study and fieldwork observations undertaken in 2021. It also built on work undertaken in the preparation of the previous 2018 planning application.

Overview of the Site

11.3.3 As shown in the **Parameters Plan in Appendix 2.1** the site is located at the southernmost tip of Loch Lomond alongside the River Leven and close to the small town of Balloch. Balloch is identified in the LLTTNP LDP as one of eight locations for ‘Strategic Tourism Opportunities’, reflecting its role as a visitor destination and gateway to the National Park. Immediately to the north of the site is Loch Lomond while to the south it is bounded by housing on the north side of Balloch. To the west is Old Luss Road and to the east is the River Leven, with Balloch Country Park beyond. Water from the loch flows out at the River Leven immediately adjacent to the eastern boundary of the site. The river flows south for 8.3km before joining the River Clyde at Dumbarton.

- The site is subdivided into a series of development areas. These are shown in the parameters plan at **Parameters Plan in Appendix 2.1** and briefly described below.

Zone A: Station Square (Brewery Including Pub, Restaurant, Monorail Station, Performance Area and Budget Accommodation)

11.3.4 This Zone lies immediately to the south of Zone B and comprises an area of gently mounded amenity grass and existing car-parking located between the River Leven, Balloch Road and Drumkinnon Woods. It is also the location of the stone built ‘Visit Scotland’ information centre and concrete Balloch Village Ferry Landing, which is used by Sweeney Cruises. The nearby Balloch Road bridge affords elevated views of the area, which is seen against the scenic backdrop of Drumkinnon Woods and high moorland. The mix of buildings, ferry landing and car parking, is functional with limited aesthetic appeal and a lack of character appropriate to its important gateway function.

Zone B: Riverfront (Monorail, Lodges and Associated Car Parking Along the River Leven)

11.3.5 Zone B is bounded by Pier Road to the west and the River Leven to the east. Comprising relatively flat landform around 11m AOD, it includes the eastern part of Drumkinnon Woods, which contains mixed pioneer woodland species. A swathe of open grassland runs through the woodland. Due to the density of the vegetation, the river and loch are only visible from edge of the woodland. This zone also includes the area of woodland between Pier Road and the rear garden fence of housing along Clairinsh Avenue.

Zone C: Pierhead (Main Loch-Shore Development Comprising the Apart-Hotel and Visitor Centre, Monorail Station)

11.3.6 Zone C comprises the area around the southern shore of Loch Lomond outside of the two-storey Loch Lomond Shores development, which includes shops, restaurants and the 25m high Drumkinnon Tower which houses the Sea Life centre. This zone also covers part of the area of land lying between Drumkinnon Bay and the River Leven, including a shingle beach, grassed picnic area and semi-mature woodland. The creation of Loch Lomond Shores involved the extension of an existing, flooded gravel pit to form a new lagoon (now called Drumkinnon Bay). The landform across much of the area is relatively flat and lies around 8m AOD. The woodland is more undulating and rises to around 17m AOD.

Zone D: Boathouse and Staff Area (New Boathouse on the Loch Shore and Separate Service Building/Areas

11.3.7 Zone D contains two distinct areas, a small promontory on the south-western shore of the loch, and an area of woodland which wraps around the southern edge of the main Loch Lomond Shores car park and is bounded by Old Luss Road and the Ben Lomond Way. The underlying landform is undulating and has been disturbed through man-made activities including the installation of a major gas pipeline.

Zone E: Woodbank House (Holiday Apartments, Lodges and Bothies)

11.3.8 The Woodbank House area is bounded by Old Luss Road to the east, agricultural land to the north and east, and a footpath and housing to the south. The site comprises the former Woodbank House Hotel and associated out-buildings and gardens, including a walled garden which is overgrown and contains a stand of self-seeded trees. Woodbank House is a Category A listed building, and the out-buildings and boundary walls are listed in association with the house. The site also includes an area of grazing land to the north and east and a large area of woodland to the west. The woodland edge is located approximately between 30-100 metres east of the A82.

11.3.9 The landform around Woodbank House rises gradually from around 17m AOD in the east to 43m AOD to the west of the main building. The higher land affords slightly elevated easterly views towards Drumkinnon Woods and the northern edge of Balloch.

11.3.10 The remains of the house are accessed from the Old Luss Road by a driveway, which runs through an area of rough pasture and is surrounded by the remains of the former gardens. The site has some attractive features, including the sandstone boundary wall and avenue of mature lime trees along its eastern boundary with Old Luss Road. Overall, however, it appears unmanaged and run down.

The Wider Study Area

11.3.11 Loch Lomond is the largest expanse of freshwater in Britain and makes for a landscape and sense of space that is expansive and with far-reaching views. Together with the many other forms of water found in the National Park, it contributes to a diverse and beautiful landscape when seen in combination with the range of landscape settings.

11.3.12 The 5km study area (see **Figure 11-1**) extends from the Clyde Valley in the south to the Highland Boundary Fault in the north. Much of it falls within the southern part of Loch Lomond and the Trossachs National Park where the landscape is lowland or transitional in character and contrasts strongly with the dramatic uplands (Arrochar Alps, Luss Hills and East Lomond uplands) to the north. This contrast in landscape character is one of the Special Qualities of the National Park and is afforded by its unique geographic position on the Highland Boundary Fault and hence comprising both lowland and highland characteristics.

11.3.13 The Highland Boundary Fault runs north-east to south-west and occupies a zone up to about 1200m wide extending from Arden on the west bank of Loch Lomond to Aberfoyle. The distinctive ridged landform and orientation of the fault zone are defining landscape characteristics. A series of islands associated with the fault form a distinctive 'islandscape', where the interlocking of land and water between islands, the loch and the indented shoreline create a picturesque composition and is one of the most distinctive and well-known images of Loch Lomond. The calm waters, which are sheltered and enclosed by natural shorelines, have a tranquil character and contribute to the sense of peacefulness which is one of the Special Qualities of the National Park.

11.3.14 To the south, the settlement corridor along the River Leven is lowland in character. Unlike in the highlands, where the rugged relief has been the dominant factor in determining landscape character, the area has developed as farm and estate land, which means it is distinctively ordered, well-used and settled, either in pockets or extending more widely. Fields, meadows, parkland, farm and policy woodlands (mixed), shelterbelts and areas of more natural vegetation are functionally and visually integrated within a mosaic.

11.3.15 The lowland landscapes have undergone much change, both in terms of land-use changes, such as field amalgamation and some afforestation, and also because of development pressures, particularly relating to housing, golf courses, recreation facilities, transport infrastructure and visitor accommodation. Characteristic patterns of relic woodland, field systems and designed landscapes nevertheless persist and include policy and formal plantings, estate boundaries, entrance features, gatehouses and estate cottages.

11.3.16 The higher intensity of human settlement and development compared to further north in the National Park, means that the southern end of the loch is less tranquil. This is particularly the case around the southern shore of the loch, where the presence of various visitor attractions and facilities, including the watersports and the Loch Lomond Shores development, attract visitors from nearby Glasgow and the Central Belt. Combined with the influence of Balloch and several arterial roads, the southern end of the loch is active and thereby lacks a sense of tranquillity and remoteness.

Land Cover and Land Use

11.3.17 The five broad types of landcover and land uses within the study area are:

- Loch Lomond;
- The tourist industry uses along the loch shores, comprising holiday accommodation, the Loch Lomond Shores development and golf courses, much of which is enclosed in woodland;
- Urban settlement along the river valley from Balloch to Dumbarton;
- Moorland, which is generally open and only occasionally forested, located on the hill sides and higher ground either side of the loch and urban settlement; and,
- Large areas of agricultural land, both arable and pasture, on the lower ground beyond the moorland and generally located towards the edge of the study area.

Woodland Cover

11.3.18 Woodland and tree cover is a key landscape element within the study area and one of the Special Qualities of the National Park. Birch is the dominant broadleaf species, with oak the second most common. Sitka spruce is the most commonly commercially planted species of tree.

11.3.19 Estate and farm woodlands, shelter belts, hedgerow trees, parkland trees, and avenues of mature trees are components of the farmland mosaic found across much of the study area. They are mostly of plantation origin, are usually mixed or broadleaf, and tend to be traditionally managed for sport, timber and shelter. Areas of relic ancient woodland survive in some areas including Drumkinnon Woods and around Woodbank House. Veteran trees such as those found in Balloch Country Park are an important feature, particularly along field boundaries where they are not only valued cultural and historic features but are particularly important for wildlife and as local links in woodland habitat networks. In areas of enclosed farmland, naturally regenerated native woodlands are limited to areas of land which were less suitable for improvement, or which have other land management benefits, such as shelter belts, riparian woodlands, wet woodlands, and loch shore fringe woodlands. These woodlands are often of limited extent but

are particularly important as strategic and local links in woodland habitat networks and in the natural setting of rivers and lochs.

Settlement

11.3.20 The only settlement of any size within the study area is the small suburban town of Balloch, the northern end of which encloses the southern boundary of the site and is contiguous with the urban area along the Vale of Leven.

11.3.21 Balloch is an easily accessible base for visitors to Loch Lomond, for people passing through on their way north and for users of the loch itself, with the town often being the main point of access to the loch. It contains many tourist-related shops, hotels and restaurants of various architectural styles and merit. The train link to Glasgow terminates here, making Balloch a readily accessible and popular destination. The visitor centre at Balloch is located in the Old Station Building in the centre of the town opposite the train station.

11.3.22 The River Leven is an important feature in Balloch, linking the centre of Balloch to Loch Lomond, with its visitor attractions, marinas and moorings. Balloch Castle Country Park extends along the river along the banks of the loch and up the hillside to Balloch Castle. It is important as an attractive, well-maintained and publicly accessible designed landscape.

Marinas, Hotels, Leisure Complexes, Caravan Parks and Chalet Developments

11.3.23 Marinas, hotels, leisure clubs, chalet development and caravan parks are mainly found close to the south and western loch shore and are shown on **Figure 11-6**.

11.3.24 Demand for tourist accommodation and other facilities has led to some larger-scale developments within the study area including hotels and leisure complexes, notably at Balloch, where the Loch Lomond Shores development offers a variety of facilities and attractions. With the exception of the prominent Drumkinnon Tower, it comprises low height buildings and is located against a backdrop of woodland, which lessens its perceptibility in longer views from the north.

11.3.25 Lomond Woods Holiday Park is situated on rising ground adjacent to the southern boundary of the Woodbank House site and approximately 650m south-west of the proposed location for the apart-hotel and visitor centre development.

11.3.26 The Cameron House complex is a former baronial mansion set in large woodlands. It has recently been restored as a hotel and spa complex with lodges, a marina and the Carrick Golf Club.

11.3.27 Duck Bay Hotel is located north of Cameron House on the shores of the loch and has holiday cottages in the grounds.

11.3.28 Lomond Castle at Luss offers self-catering accommodation in both the castle and purpose-built lodges and a restaurant situated in a woodland setting in the Lomond Castle Estate on the shore of the loch.

Outdoor Access

11.3.29 The area offers a range of formal and informal recreational and leisure opportunities.

11.3.30 The main walks close to the site are shown on **Figure 11-6**. The John Muir Way coast-to-coast trail and Three Lochs Way share the same route as they follow the riverside and loch side before passing around the northern side of the Woodbank House site and turning south on Old Luss Road. National Cycle Route No. 7 (Loch and Glens North) passes to the south and east of the site, and West Loch Lomond Cycle Path, starts at the slipway on the riverside and follows the loch shore before turning north on Old Luss Road. The Loch Lomond Shores Walk is a local route around the south-western edge of the loch.

11.3.31 Within the wider area, the National Park offers opportunities for hiking and mountain climbing. For example, Shantron Hill, lies 7.5km to the north-west of the site and, although outside the study area, has been included within the LVIA (Viewpoint 21) to demonstrate the potential impact of the proposed development from the higher ground to the north.

Water-Based Recreation

11.3.32 The southern end of Loch Lomond is popular for watersports including sailing, windsurfing, water-skiing, pleasure craft and jet skiing. The Maid of the Loch is the last paddle steamer built in the UK. Operated on Loch Lomond for 29 years the ship is currently (Spring 2022) out of the water and undergoing restoration at Balloch pier with a view to her being returned to full steam operation on the loch. Fishing is generally widespread in the area.

Golf Courses

11.3.33 Golf courses within the study area include Cameron House Golf Course, which lies immediately to the north-west of the site and the Carrick Golf Course associated with Cameron House to the north of Arden.

11.3.34 Together with other leisure complexes, the cumulative impact of golf course development in the area has locally eroded the more traditional lowland farm and estate landscape character. The golf courses and associated artificial landforms, manicured grasslands, bunkers, access paths, and buildings, create a golf course landscape. Loch shore woodlands and natural loch shore fringe features are compromised where holes cross the water's edge, and where artificial retention is introduced along natural shorelines.

Other Businesses

11.3.35 Other businesses not identified elsewhere within the baseline include:

- Hotels, Restaurants and Bars on Balloch Road near Balloch Bridge; and,
- Hotels, Restaurants and Bars near Balloch Road/ Old Luss Road roundabout.

Transport Corridors

11.3.36 The A82 is an important tourist route which passes along the west side of the loch some 200m west of Woodbank House and 725m west of the proposed location of the apart-hotel and visitor centre.

11.3.37 The other arterial road within the study area is the A811 (Sterling Road), which leaves the A82 approximately 200m south of the Woodbank House site and runs east through Balloch to the south of the site, before turning north-east.

11.3.38 These main roads are typically associated with the natural regeneration of tree and shrub vegetation along the road corridor. Often associated with embankments, the high coverage of trees and woodland encloses the road corridors and obscures many outward views.

11.3.39 Minor local roads include Old Luss Road and Ben Lomond Way. The North Clyde Rail Line terminates at Balloch station close to the proposed site.

Visibility of the Site

11.3.40 The main factors influencing views to and from the site are the local landform, high coverage of woodland and built development on the north side of Balloch. The clearest views of the site are from the loch and the loch shore to the north and are typically experienced by visitors using the recreational facilities both on and off the water.

11.3.41 From the south and the northern edge of Balloch, the local variations in landform and the high coverage of trees, particularly within Drumkinnon Woods, obscure or filter most views towards the site, even in winter when most of the trees are not in leaf.

11.3.42 Views from the west, including from Old Luss Road and the A82, are mainly obscured by the local landform and by woodland and trees along the road corridors, within Cameron House Golf Course and around the Loch Lomond Shores development.

11.3.43 Views from the east, including from the A811, are similarly filtered or obscured by woodland along the River Leven and within Balloch Country Park, although the higher ground within the park affords some elevated views across the woodland and wood pasture towards Drumkinnon Tower.

11.3.44 Views across the loch and intervisibility of the many designed landscapes around the southern end of the loch are one of the Special Qualities of the National Park, the eye being drawn to the visual foci of the grand houses around the shore and the islands, as well as northwards towards

the upper loch basin. The loch tends to be viewed in relation to tree cover, with woodlands framing views across the water. The woodlands define the lower and mid-glen slopes, the loch shores and islands, and distinguish them from the open uplands. The woods and the trees are important visually, bringing a tapestry of texture and colour that changes throughout the year.

11.3.45 The group value of sites at the south end of Loch Lomond and how they are seen 'as one' from across the water, and from the road or other viewpoints, is a key concern to the National Park Authority. The houses associated with these designed landscapes were often situated on rising ground to take maximum advantage of views over their surroundings.

Designated Landscapes

11.3.46 The importance of the study area is recognised through national and regional designations, which aim to identify and protect the landscape. These are shown in **Figure 11-5** and listed below:

- Loch Lomond and the Trossachs National Park;
- Loch Lomond National Scenic Area (NSA); and,
- Kilpatrick Hills Local Landscape Area (LLA).

11.3.47 Designated cultural heritage and ecological sites are also shown in **Figure 11-5**, but the assessment of effects on them is covered elsewhere in the EIAR (**Chapter 5: Ecology; Chapter 6: Trees and Woodland; and Chapter 13: Archaeology and Cultural Heritage**). The purpose of recording them here is to consider their contribution to the value of the landscape.

11.3.48 There are several relic ancient woodlands located within the study area, including within Drumkinnon Woods and around Woodbank House. The assessment of the effects on ancient woodland from an ecological perspective is provided in **Chapter 5**: **Ecology** and **Chapter 6: Trees and Woodland**. The effects of the proposed development on woodland as a landscape element is presented as part of this LVIA.

11.3.49 The site is not within a Conservation Area and neither does it directly affect a statutorily listed building or building of local interest (excluding Woodbank House). Woodbank House is a dilapidated Category A listed building which lies within the site, the restoration of which forms part of the proposed development. The assessment of the effects on Woodbank House from a heritage perspective is provided in **Chapter 13: Archaeology and Cultural Heritage**. The effects of the proposed development on Woodbank House as a landscape feature forms part of this LVIA.

Loch Lomond and the Trossachs National Park

11.3.50 The site and much of the 5km study area are located within the Loch Lomond and the Trossachs National Park, a nationally important landscape, which was designated in order to conserve and enhance the natural and cultural heritage, promote more sustainable use of the natural resources, promote understanding and enjoyment of the special qualities of the area by the public, and to promote sustainable social and economic development.

11.3.51 The Special Landscape Qualities of the National Park23 are defined as 'the characteristics that, individually or combined give rise to an area's outstanding scenery'. Due to the heterogeneous nature of the landscape, the report subdivides it into four landscape areas, of which Loch Lomond is relevant to the proposed development.

11.3.52 The qualities that make the landscape and scenery of Loch Lomond special are described in the **Landscape Character Assessment in Appendix 11.3**. These are also the qualities that underpin the original reason for designating the Loch Lomond NSA.

Loch Lomond National Scenic Area

11.3.53 The value of the scenery is recognised through the designation of the loch and its surroundings as an NSA. The landscape within the NSA is notable for its high coverage of deciduous woodland, particularly in the transitional, island-studded section, where the semi-natural woods

[23] Scottish Natural Heritage and Loch Lomond and The Trossachs National Park Authority (2010), *The special landscape qualities of the Loch Lomond and The Trossachs National Park*, Scottish Natural Heritage Commissioned Report, No.376 (iBids and Project no 648)

of the islands are complemented by the policy woodlands on the shore. The east side of the loch also has extensive coniferous plantation.

11.3.54 The southern boundary of the NSA is approximately 1km north of the site's northern boundary. There is strong overlap between the Loch Lomond landscape area referred to above, and the boundaries of the NSA. Hence if the special qualities of the Loch Lomond NSA are required, then they equate to the qualities of the landscape area under the heading 'Loch Lomond' in SNH Commissioned Report No. 376.

11.3.55 It is noticeable that this NSA does not cover the southern end of Loch Lomond or the site, which suggests that the quality of the landscape around the site fell short of that required for NSA designation.

Kilpatrick Hills Local Landscape Area

11.3.56 The value of the Kilpatrick Hills landscape is recognised by its designation in the West Dunbartonshire Local Development Plan24 adopted in 2020, and in the East Dunbartonshire Evidence Report 525 as an LLA.

11.3.57 Despite their proximity to settlements, parts of the Kilpatrick Hills have a strong sense of remoteness and wildness, particularly at their core. Open horizons offer panoramas and a unique diversity of views, including across central Scotland and northwards to the Highlands from which 'borrowed' views increase the perceived scale of the landscape. The key landscape and visual characteristics of the Kilpatrick Hills are described in further detail in a Statement of Importance26, and Supplementary Guidance is being prepared by West Dunbartonshire Council to set a framework for the protection and enhancement of the area's special qualities.

Gardens and Designed Landscapes

11.3.58 Although not having statutory protection, Gardens and Designed Landscapes (GDL) make an important contribution to the landscape character of the study area, through their policy tree features, wood pasture, woodlands, tree belts and tree-lined fields, their buildings and the natural topographic features on which they are based. Those within the study area vary in their distribution, size, style, periods of development, features, current uses and condition. Balloch Castle GDL is considered of national importance and included in the Inventory of Gardens and Designed Landscapes managed by Historic Environment Scotland (HES).

11.3.59 As shown in **Figure 12-5**, Balloch Castle GDL is situated within the eastern side of the study area. Balloch Castle is a 19th century gothic style castle, which was erected on the site of a much earlier structure. The building, which is on the Buildings at Risk Register, is Category A listed. The wider estate, which includes pleasure gardens, a walled garden, and an area of wood pasture with mature trees, all of which are framed by ornamental and semi-natural woodlands, is designated a Country Park with nature trails and guided walks. Leased to West Dunbartonshire Council, the park is a popular local visitor attraction. The western boundary of the Country Park is approximately 55m from the eastern boundary of the site on the opposite side of the River Leven at the point where the river flows out of the loch. The main access route from Balloch into the Park and up to Balloch Castle lies closer to the eastern boundary of the Park.

11.3.60 Other designed landscapes, which are not on the Inventory or have statutory protection but contribute to the local historic environment and landscape character include: Botwich Castle; Arden House; Auchendennan; Bennachra; Calrdarven; Cameron House; Westerton; Woodbank; and Lomond Castle.

11.3.61 All the designed landscapes have tree belts and woodlands to a greater or lesser degree and make an important contribution to the wider landscape and local scenery. Parkland is less prevalent. Small groups of special trees impart some of the sites (Balloch Castle, Arden, Lomond Castle) with a distinctive character that is important to retain.

[24] West Dunbartonshire Council (2020), West Dunbartonshire Local Development Plan 2

[25] East Dunbartonshire Council (2015), East Dunbartonshire Evidence Report 5: Kilpatrick Hills Statement of Importance

[26] West Dunbartonshire Council (2015), Kilpatrick Hills Local Landscape Area Statement of Importance

11.3.62 Around the southern end of Loch Lomond, where many of the estates are found, the designed landscapes have group value and their intervisibility gives them additional significance. The assessment of the effects of the proposed development on the estates from a heritage perspective is provided in **Chapter 13: Archaeology and Cultural Heritage**.

Landscape Character Types

11.3.63 In 2019 NatureScot (then SNH) published an on-line interactive landscape character assessment at 1:50 000, which defined 390 Landscape Character Types (LCT) across Scotland. This assessment supersedes previous landscape assessments applicable to the study area.

11.3.64 The 2019 landscape character assessment identifies nine LCTs across the study area. These are shown in **Figure 11-4**. An initial desk-based screening assessment of the potential effect of the proposed development on the key characteristics and overall character of these LCTs showed that only three could potentially experience any significant effects. These were taken forward to the main assessment. The reasoning behind this is set out in **Table 11-3** below and the results were verified during the site survey work.

Table 11-3: Landscape Character Types defined in the 2019 NatureScot On-Line Landscape Character Assessment

LCT	Explanation of Why the LCT Was/ Was Not Taken Forward for Assessment
LCT 38: Open Ridges	This LCT lies to the west of the site, and on the western side of the high ridgeline which extends extending from Ben Bowie south to Bromley Muir. The ZTV shows that the proposed development should not be visible and potential indirect effects are highly unlikely to arise. Not considered further in the assessment
LCT 46: Rolling Farmland with Estates - Argyll	This LCT lies to the west of the site, and on the western side of the high ridgeline which extends extending from Ben Bowie south to Bromley Muir. The ZTV shows that the proposed development should not be visible and potential indirect effects are highly unlikely to arise. Not considered further in the assessment
LCT 200: Rolling Farmland - Glasgow & Clyde Valley	This LCT lies to the south-west of site. The northern part of the LCT lies relatively close to the site and the ZTV shows some intervisibility with the proposed development, but it is physically separated from the site by the wooded corridor of the A82, which should obscure most inward and outward views (the ZTV assumes no woodland present). Also, its wider landscape setting is already characterised by built development as it abuts the urban edge of Balloch so the proposed development should not fundamentally alter the character of the landscape within the LCT. Significant indirect effects arising from the presence of the proposed development are therefore considered highly unlikely. Not considered further in the assessment
LCT 215: Open Ridgeland - Glasgow & Clyde Valley	This LCT lies to the west of the site. The elevation of the landform means there will be some intervisibility with the proposed development as shown in the ZTV, but these views will be very distant and will not fundamentally alter the character of the landscape within the LCT. Significant indirect effects arising from the presence of the proposed development are therefore considered highly unlikely. Not considered further in the assessment
LCT 216: Rugged Moorland Hills	This LCT lies to the south-east of the site from which it is physically separated by the town of Balloch. The elevation of the landform means there will be some intervisibility with the proposed development as shown in the ZTV, but these views will be very distant and will not fundamentally alter the character of the landscape within the LCT. Also, the wider

LCT	Explanation of Why the LCT Was/ Was Not Taken Forward for Assessment
	landscape setting of the LCT is already characterised by built development as it abuts the urban edge of Balloch. Significant indirect effects arising from the presence of the proposed development are therefore considered highly unlikely. Not considered further in the assessment
LCT 255: Parallel Ridges - Loch Lomond & the Trossachs	This LCT lies to the north-west of the site and includes the summit of Ben Bowie. The elevation of the landform means there will be some intervisibility with the proposed development as shown in the ZTV, but these views will be very distant and will not fundamentally alter the character of the landscape within the LCT. Significant indirect effects arising from the presence of the proposed development are therefore considered highly unlikely. Also, land cover within the LCT comprises mainly managed plantation woodland which means that inward and outward views will be partially obscured (the ZTV assumes no woodland present). Significant indirect effects arising from the presence of the proposed development are therefore considered highly unlikely. Not considered further in the assessment
LCT 261: Rolling Farmland - Loch Lomond & the Trossachs	Both parts of this LCT lie relatively close to the site. As illustrated by the ZTV, there is some potential for significant indirect effects. Considered within the **Landscape Character Assessment in Appendix 11.3**.
LCT 263: Lowland Loch Basin - Loch Lomond & the Trossachs	The southern part of this LCT covers the site and there is potential for significant direct and indirect effects. Considered within the **Landscape Character Assessment in Appendix 11.3**.
LCT 264: Lowland Loch Basin Islands	This LCT is located some 4km to the north of the site. As illustrated by the ZTV, due to the openness of the views across the open loch, there is potential for significant indirect effects. Considered within the **Landscape Character Assessment in Appendix 11.3**.

Visual Receptors

11.3.65 In addition to local residents, Balloch and southern end of Loch Lomond is an important visitor hub for many users of the National Park. People either use Balloch as their ultimate destination or use the town as a starting point to explore the wilder, more rugged and more scenic areas of the National Park to the north. The area is also host to recreational visitors, to whom the landscape is not an essential feature e.g., people using the golf courses along the south-western side of the loch. Even though the surrounding scenery is not essential to visitors' enjoyment, it clearly is an additional attraction and a 'selling point' for these golf courses.

11.3.66 The viewpoints used to support the assessment of visual effects are listed in **Table 11-3**, together with an explanation as to why they were selected. The viewpoint locations are shown on the ZTVs in **Figures 11-3a** – **11-3e** in **Appendix 11.1**. The full viewpoint assessment is included in **Appendix 11.4**.

11.3.67 A total of 23 viewpoints were selected through desk study, site work and consultation. These viewpoints are all in locations which can be accessed by the public. The viewpoints include:

- *'Representative viewpoints, selected to represent the experience of different types of visual receptor, where larger numbers of viewpoints cannot all be included individually and where the significant effects are unlikely to differ - for example, certain points may be chosen to represent the views of users of particular public footpaths and bridleways;*

- *Specific viewpoints, chosen because they are key and sometimes promoted viewpoints within the landscape, including for example specific local visitor attractions, viewpoints in areas of particularly noteworthy visual and/or recreational amenity such as landscapes with statutory landscape designations, or viewpoints with particular cultural landscape associations; and,*
- *Illustrative viewpoints, chosen specifically to demonstrate a particular effect or specific issues, which might, for example, be the restricted visibility at certain locations' (*GLVIA3 Paragraph 6.19).

11.3.68 The viewpoints are a selection of locations from where the proposed development is likely to be visible and are not intended to represent all locations from where there may be a view. They were selected in discussions with the National Park's Natural Heritage Planning Officer and through consideration of the ZTVs presented in **Figures 11-3a** – **e**. The ZTVs show the likely visibility of the different components of the proposed development. These are based on a bare earth model and therefore do not include the screening effect of vegetation or buildings.

11.3.69 To avoid confusion, the numbering of viewpoint locations has been kept the same as the original LVIA, which accompanied the previous 2018 planning application. It was agreed with National Park's Natural Heritage Planning Officer that, as the design of the proposed development has altered substantially since the original application, some of the viewpoint locations are not now required. These are noted in **Table 11-4** as 'VP number not used'.

Table 11-4 : Viewpoint Locations Used in the Assessment

No.	Location	Reason for Selection	Grid Ref. (E/N)	Approx. Distance from Site Boundary
VP 01	Ben Lomond Way	Located at the back of the Loch Lomond Shores development to represent the transient views experienced by people using Ben Lomond Way and accessing the Loch Lomond Shores development.	E 238618 N 682200	Within the application boundary
VP 02	Loch Lomond Shores	Located on the timber walkway in front of the shops and restaurants within the Loch Lomond Shores development. The walkway forms part of the John Muir Way/ Three Lochs Way. It represents the views experienced from the southern shores of Loch Lomond, including from the many businesses and visitor attractions at or near this location.	E 238447 N 682218	165m
VP 03	Maid of the Loch Slipway	Located on Balloch Pier to represent the views experienced by visitors and loch users accessing Balloch Pier and the nearby slipways.	E 238507 N 682574	35m
VP 04	Woodbank House	Located on the access road leading from Old Luss Road to the former Woodbank House. It represents the views experienced by people accessing the Woodbank House site.	E 238203 N 681842	Within the application boundary
VP 05	Old Luss Road – looking south east	This viewpoint is located on Old Luss Road. It represents the transient views experienced by users of the John Muir Way/ Three Lochs Way, West Loch Lomond Cycle Path, users of old Luss Road and residents of nearby residential properties (including holiday accommodation).	E 238106 N 682040	On edge of application boundary

No.	Location	Reason for Selection	Grid Ref. (E/N)	Approx. Distance from Site Boundary
VP 06	Old Luss Road - looking west	This viewpoint is located on the edge of properties on the northern side of Old Luss Road. It represents the views experienced by users of the John Muir Way/ Three Lochs Way, users of Old Luss Road and residents in properties around the junction of Old Luss Road with Stoneymollan Road.	E 238329 N 681861	Within the application boundary
VP 07	VP number not used	This viewpoint was removed in agreement with LLTTNP Landscape Officer following the original planning application.	-	-
VP 08	John Muir Way - on the eastern bank of the River Leven	This viewpoint is located on the eastern banks of the River Leven within Balloch Country Park. It represents the views experienced by boat users, visitors to Balloch Castle and Balloch Country Park, as well as people using the John Muir Way/ Three Lochs Way and National Cycle Route 7.	E 239063 N682142	100m
VP 09	Pier Road – looking north-west	This viewpoint is located on Pier Road just to the east of the residential properties, which front onto Clairinsh Avenue. It represents the transient views experienced by people accessing the loch and the Loch Lomond Shores development.	E 238883 N 682022	Within the application boundary
VP 10	Balloch Road – bridge over the River Leven	This viewpoint is located on Balloch Bridge in Balloch. This location is regarded as the gateway to the National Park and affords iconic views north across Loch Lomond towards the Highlands. It represents the views experienced by boat users (including Sweeney's Cruises), people using John Muir Way/ Three Lochs Way, National Cycle Route 7, West Loch Lomond Cycle Path, users of Balloch Road, visitors to nearby hotels, restaurants and bars and residents in nearby properties.	E 239106 N 681959	85m
VP 11	VP number not used	This viewpoint was removed in agreement with LLTTNP Landscape Officer following the original planning application.	-	-
VP 12	Upper Stoneymollan	This viewpoint is located on Upper Stoneymollan Road on the edge of the National Park. It represents the transient views experienced by people using the John Muir Way/ Three Lochs Way, Upper Stoneymollan Road. It also represents the views of people staying in the nearby Upper Stoneymollan holiday accommodation.	E 237797 N 681638	284m
VP 13a	Roundabout at Vaudervale Gardens – looking north west	This viewpoint is located on Balloch Road close to the roundabout at the junction of Ben Lomond Way and	E 238582 N 681714	85m

No.	Location	Reason for Selection	Grid Ref. (E/N)	Approx. Distance from Site Boundary
		just within the edge of the National Park. It represents the views experienced by people using the local road network, visitors to nearby hotels, restaurants and bars, and residents in nearby properties (including people staying in local holiday accommodation).		
VP 13b	Roundabout at Vaudervale Gardens – looking north-east	Due to the presence of intervening buildings and woodland there will be no views of the proposed development and therefore no visual effects. This viewpoint is therefore not considered further.	E 238582 N 681714	85m
VP 14	Boathouse Marina near Cameron Golf Course	This viewpoint is located at the jetty at Cameron House. It represents the views experienced by users of Cameron House Marina, the nearby Cameron House Golf Course, boat users and people staying in holiday accommodation associated with Cameron House.	E 237846 N 682716	700m
VP 15	Proposal Beach in Balloch Country Park	This viewpoint is located on Proposal Beach in Balloch Country Park. It represents the views experienced by boat users, people using the beach and users of the John Muir Way/ Three Lochs Way.	E 238706 N 682994	540m
VP 16	VP number not used	This viewpoint was removed in agreement with LLTTNP Landscape Officer following the original planning application.	-	-
VP 17	Balloch Castle, Balloch Country Park	This viewpoint is located on the east side of Loch Lomond in Balloch Country Park close to Balloch Castle. It represents the views experienced by people using the main footpath leading from Balloch to the Castle.	E 239018 N 683033	644m
VP 19a	The Cruin Restaurant Jetty near Arden House	Due to the promontory on the south side of Duck Bay and high tree cover along the shores of the loch there will be no views of the proposed development and therefore no visual effects. This viewpoint is therefore not considered further.	E 236503 N 684339	2.7km
VP 19b	The Cruin Restaurant Jetty near Arden House	Due to the promontory on the south side of Duck Bay and high tree cover along the shores of the loch there will be no views of the proposed development and therefore no visual effects. This viewpoint is therefore not considered further.	E 236541 N684373	2.7km
VP 20	VP number not used	This viewpoint was removed in agreement with LLTTNP Landscape Officer following the original planning application.	-	-
VP 21	Shantron Hill	Distant views of the southern end of the loch and Loch Lomond Shores	E 233499 N 686834	6.5km

No.	Location	Reason for Selection	Grid Ref. (E/N)	Approx. Distance from Site Boundary
		development are obscured by intervening landform and high tree cover along the shores of the loch. This viewpoint is therefore not considered further.		
VP 22	Footpath to Balloch Castle in Balloch Country Park	This viewpoint is located in Balloch Country Park to the west of housing around Inchconnachan Avenue. It represents the transient views experienced by people using the lower section of the main footpath leading from Balloch to the Castle.	E 239326 N 682429	450m
VP 23	Footpath to Balloch Castle in Balloch Country Park	This viewpoint is located in Balloch Country Park to the west of housing around Inchconnachan Avenue. It represents the transient views experienced by people using the middle section of the main footpath leading from Balloch to the Castle.	E 239291 N 682710	590m
VP 24	Footpath to Balloch Castle in Balloch Country Park	This viewpoint is located in Balloch Country Park where the access road and footpath to the Castle diverge. It represents the transient views experienced by people using the upper section of the main footpath leading from Balloch to the Castle.	E 239222 N 682854	585m
VP 25	Boat on the southern end of Loch Lomond	This viewpoint is located at the southern end of Loch Lomond and represents the views experienced by boat users.	E 238361 N 682928	500m
VP 26	Boat on the southern end of Loch Lomond	This viewpoint is taken at the southern end of Loch Lomond and represents the views experienced by boat users.	E 238316 N 683536	190m

11.3.70 These viewpoints were selected and agreed with the National Park's Landscape Officer and through consideration of the ZTVs presented in **Figures 11-3a – d**. The ZTVs show the likely visibility of the different components of the proposed development. These are based on a bare earth model and therefore do not include the screening effect of vegetation or buildings.

Evolution of the Baseline in the Absence of the Proposed Development

11.3.71 In the absence of the proposed development, it is likely that the woodland areas would continue maturing and evolving as they have done over recent years. It is also likely that the Woodbank House area of site, including the remains of the Grade A listed Woodbank House, would become more overgrown and dilapidated in appearance.

11.3.72 Notwithstanding the above, as detailed in **Chapter 5 – Legislative and Policy Context**, the site is allocated within the adopted LLTNP LDP (2016) under Balloch proposals VE1 and VE4 for visitor experience related uses. It can therefore reasonably be assumed that, in the absence of the proposed development, then another development proposal involving buildings and changes to land use and land cover will be proposed.

11.4 Embedded Mitigation

11.4.1 The most effective mitigation measures are ones which are integral to the scheme. A distinction is therefore made between measures designed as an intrinsic part of the scheme (primary or embedded measures) and those which are intended to specifically counter any adverse effects of the proposed development identified through the assessment process (secondary measures).

11.4.2 As detailed in **Chapter 2 – Site and Proposed Development**, a number of design features and embedded mitigation measures have been incorporated into the design and construction of the proposed development to avoid, prevent or minimise significant adverse environmental effects and to enhance beneficial effects. Embedded mitigation measures of particular relevance to the LVIA are set out below under construction and operation phase.

Construction Phase

11.4.3 In addition to the installation of site hoarding to minimise the landscape and visual effects of the proposed development, a number of other good practice mitigation measures will be secured via the implementation of a Construction and Environmental Management Plan (CEMP) to ensure effective site management. These good practice measures will include the following:

- 12m buffer (i.e., no construction) around the site boundary with residential are of Drumkinnon Gate;
- Any construction activities within 5m corridor of the shoreline will be subject to specific consideration within the CEMP and agreed with the National Park Authority prior to commencement;
- Location of construction compounds and temporary stockpiles in the least visibly prominent locations within the site;
- Use of well-maintained hoardings and fencing;
- Protection of all retained vegetation on the site in accordance with BS 5837: Trees in relation to design, demolition and construction;
- Prevention of damage to landscape features adjacent to the construction plots due to movement of construction vehicles, plant or operatives;
- Working with existing topography to minimise ground level regrading where possible;
- Access to all key nodes and routes through the site are to be maintained during the construction phase. Localised diversions to facilitate construction may occur on land within the applicant's control. Any impacts on walking/ cycle routes during the construction phase will be short term and localised diversions will be put in place;
- Continued provision of access through parts of the site to existing receptors and land uses as identified in **Chapter 2 Site and Proposed Development** and **Chapter 12 Traffic and Transport**.
- Design of lighting to avoid unnecessary intrusion onto adjacent buildings and siting construction compounds and machinery to minimise upward and outward lightspill;
- Use of designated construction traffic routes to and from the site in order to minimise visual amenity effects on neighbouring sensitive receptor areas; and
- Engagement of an Ecological Clerk of Works (ECoW) to work on site with the construction contractor to oversee the management of the risks associated with protecting biodiversity and manage ecological operatives engaged in ecological mitigation activities.

Operational Phase

- 12m buffer (i.e., no operational activities) around the site boundary with residential area of Drumkinnon Gate;
- Screening increased around the boundary between woodland and residential area using evergreen native shrubs of local provenance, to reduce visual effects on nearby residents;
- Unsightly utilities to be screened and incorporated within the woodland setting;
- Proposed car parking to be sensitively incorporated into the woodland. Surface materials to be in keeping with the location and context. Additional mitigation measures such as buffer planting to provide natural screening to new car parking;
- Existing pathways, to be regraded and enhanced with new porous surfacing materials;
- New woodland planting to be created on the Woodbank House site;
- Retention of Woodbank House listed building facade as a landmark feature;

- Continued public access to Drumkinnon Bay waterfront;
- Continued provision of access through the site to existing receptors and land uses as identified in **Chapter 2: Site and Proposed Development**;
- Safeguarding of identified important trees within existing woodland areas, as identified in the Parameters Plan in **Appendix 2.1**;
- Integration of Station Square proposals with Balloch Street Design Project and Sweeney Cruises proposal;
- Elevated sections of monorail to have sufficient clearance above roads and paths to allow for passage underneath; and,
- Access to all key nodes and routes will be maintained during operation with the quality of some routes enhanced. Some permanent localised diversions may be required; however, this will be limited to using other land within the applicant's control in order to avoid lengthy or circuitous alterations.

11.5 Assessment of Likely Significant Effects

11.5.1 The assessment of landscape and visual effects follows the methodology presented in **Appendix 11.2**. Demolition / construction and operational effects are assessed and reported separately.

11.5.2 Effects on landscape are reported by reference to LCTs and visual effects on receptors are reported by reference to representative viewpoints.

11.5.3 The landscape and visual assessments are presented in **Appendix 11.3** and **Appendix 11.4** respectively.

11.5.4 The tables below summarise all landscape and visual effects, including those that are considered not significant.

Construction Phase

11.5.5 As is commonplace with this type of development, the scale of the construction activities means that the works will be visible from locations in and around the site and will have the potential to give rise to significant effects that cannot practicably be mitigated. Such effects are temporary and will vary over the construction period depending on the intensity and scale of works at the time. The assessment of landscape and visual effects has been based on the activities occurring during the peak construction phase, which is defined as the period during which the main construction activities will take place.

11.5.6 The most apparent changes to the landscape and to views experienced by visual receptors during construction will relate to the presence of construction plant, compounds and materials storage. Cranes used to construct the apart-hotel will be new skyline features.

11.5.7 Key construction activities that will give rise to these most apparent changes are the establishment of construction compounds, site preparation and enabling works, demolition of buildings and structures, construction activities and site finalisation and removal of compounds. A detailed description of the activities with the potential to result in construction effects is presented in **Chapter 2: Site and Proposed Development**.

11.5.8 Inherent mitigation measures, which will be implemented during the construction period, include the erection of site hoardings around the relevant phases of the proposed development and the implementation of the good practice measures set out in the CEMP as described in Section 1.5 of this chapter.

11.5.9 **Table 11-4** and **Table 11-5** summarise the assessment of construction effects on the landscape (and wider landscape) and on views (represented by the viewpoints) within the 5km study area. They also provide an indication of whether or not those effects are considered to be significant.

Likely Significant Effects on the Landscape Within the National Park Including its Special Qualities During Construction

11.5.10 During construction there will be direct and indirect adverse effects on the landscape within the site and its immediate setting, which falls within the National Park. Within 1km of the site, there

will also be indirect adverse effects on the quality of the views both within and into/out of the National Park. Taken together, these direct and indirect effects will be medium in scale and moderate in significance. They will, however, be short-term and temporary. They are also in the southernmost part of the National Park, in an area which has been influenced by proximity to Balloch and the presence of visitor attractions and facilities, including the Loch Lomond Shores development.

11.5.11 During construction there is a moderate risk of loss or damage to the following Special Qualities of the National Park:

- A world-renowned landscape famed for its natural beauty;
- The rich variety of woodlands;
- Famous through-routes; and,
- Banks of broadleaved woodland.

11.5.12 It should be noted, however, that this risk applies only to a very localised area around the southern end of the loch.

Likely Significant Effects on the Landscape Within the LCTs During Construction

11.5.13 During construction there will be direct and indirect adverse effects on the landscape within the site and its immediate setting, which falls within LCT 263: Lowland Loch Basin – Loch Lomond and the Trossachs. Within 1km of the site, there will also be indirect adverse effects on the quality of the views both within and into/ out of the LCT.

11.5.14 Taken together, the direct and indirect effects on the southern part of LCT 263, will be medium in scale and moderate in significance. They will, however, be short-term and temporary. They are also in the southernmost part of LCT 263, in an area which has been influenced by proximity to Balloch and the presence of visitor attractions and facilities, including the Loch Lomond Shores development.

Table 11-5 : Summary of the Landscape Assessment - Construction

Impact and Receptor	Likely Significant Effect	Significant?
Loch Lomond and the Trossachs National Park	Temporary and reversible, short to medium-term, direct, adverse effect of moderate significance but only for a very localised area around the southern end of Loch Lomond. Moderate risk to loss or damage to the following Special Qualities – similarly only for a localised area around the southern end of Loch Lomond: ▪ A world-renowned landscape famed for its rural beauty ▪ The rich variety of woodlands; ▪ Famous through-routes; and, ▪ Banks of broadleaved woodland.	**Significant (locally)**
LCT 263: Lowland Loch Basin – Loch Lomond & the Trossachs	Temporary and reversible, short to medium-term, direct, adverse effect of moderate significance.	**Significant (locally)**
LCT 264: Lowland Loch Basin – Islands	Temporary and reversible, short to medium-term, indirect, adverse effect of minor significance.	Not Significant
LCT 261: Rolling Farmland – Loch Lomond & The Trossachs	Temporary and reversible, short to medium-term, indirect, adverse effect of minor significance.	Not Significant
LCT 255: Parallel Ridges - Loch Lomond & The Trossachs	Temporary and reversible, short to medium-term, indirect, adverse effect of minor significance.	Not Significant

Likely Significant Effects on Views During Construction

11.5.15 Significant adverse visual effects are predicted from locations within 1km of the proposed development during the construction phase, with major adverse effects identified for receptors represented by VP 01: View from Ben Lomond Way, VP 02: View from Loch Lomond Shores,

VP 03: View from the Maid of the Loch Slipway, VP 10: View from Balloch Road, VP 25 and VP 26: Views from the southern end of Loch Lomond.

11.5.16 Significant adverse effects are identified for other receptors within 1km of the proposed development, with moderate adverse effects identified for receptors represented by VP 04: View from Woodbank House, VP 05: View from Old Luss Road looking SE, VP 06: View from Old Luss Road looking W, VP 08: View from John Muir Way on the eastern bank of the River Leven, VP 09: View from Pier Road, VP 14: View from Boathouse Marina near Cameron Golf Course, and VP 15: View from the jetty at Proposal Beach in Balloch Country Park.

Table 11-6: Summary of the Viewpoint Assessment – Construction

Impact and Receptor	Likely Significant Effect	Significant?
VP01: View from Ben Lomond Way	Temporary and reversible, short-term, adverse effect of major significance	**Significant**
VP02: View from Loch Lomond Shores	Temporary and reversible, short-term, adverse effect of major significance	**Significant**
VP 03: View from the Maid of the Loch Slipway	Temporary and reversible, short-term, adverse effect of major significance	**Significant**
VP 04: View from Woodbank House	Temporary and reversible, short-term, adverse effect of moderate significance	**Significant**
VP 05: View from Old Luss Road looking South East	Temporary and reversible, short-term, adverse effect of moderate significance	**Significant**
VP 06: View from Old Luss Road looking West	Temporary and reversible, short-term, adverse effect of moderate significance	**Significant**
VP 07	Viewpoint removed following 2018 application	-
VP 08: View from John Muir Way on the eastern bank of the River Leven	Temporary and reversible, short-term, adverse effect of moderate significance	**Significant**
VP 09: View from Pier Road	Temporary and reversible, short-term, adverse effect of moderate significance	**Significant**
VP 10: View from Balloch Road	Temporary and reversible, short-term, adverse effect of major significance	**Significant**
VP 11	Viewpoint removed following 2018 application	-
VP 12: View from Upper Stoneymollan	Temporary and reversible, short-term, adverse effect of minor significance	Not Significant
VP 13a: View from the Roundabout at Vaudervale Gardens – Looking North West	Temporary and reversible, short-term, adverse effect of minor significance	Not Significant
VP 13b: View from the Roundabout at Vaudervale Gardens – Looking North East	No view therefore not assessed	-
VP 14: View from Boathouse Marina near Cameron Golf Course	Temporary and reversible, short-term, adverse effect of moderate significance	**Significant**
VP 15: View from the jetty at Proposal Beach in Balloch Country Park	Temporary and reversible, short-term, adverse effect of moderate significance	**Significant**
VP 16	Viewpoint removed following 2018 application	-
VP 17: View from Balloch Castle in Balloch Country Park	Temporary and reversible, short-term, adverse effect of minor significance	Not Significant
VP 18	Viewpoint removed following 2018 application	-
VP 19a: View from the Cruin Restaurant Jetty near Arden House	No view therefore not assessed	-
VP19b: View from the	No view therefore not assessed	-

Impact and Receptor	Likely Significant Effect	Significant?
Cruin Restaurant Jetty near Arden House		
VP 21: View from Shantron Hill	No view therefore not assessed	-
VP 22: View from Footpath to Balloch Castle in Balloch Country Park	No view therefore not assessed	-
VP 23: View from Footpath to Balloch Castle in Balloch Country Park	Temporary and reversible, short-term, adverse effect of minor significance	Not Significant
VP 24: View from Footpath to Balloch Castle in Balloch Country Park	Temporary and reversible, short-term, adverse effect of minor significance	Not Significant
VP 25: View from Southern end of Loch Lomond	Temporary and reversible, short-term, adverse effect of major significance	**Significant**
VP 26: View from Southern end of Loch Lomond	Temporary and reversible, short-term, adverse effect of major significance	**Significant**

Operational Phase

11.5.17 Following completion of the proposed development, significant effects on the landscape and on views will result from the presence of the new retail and commercial premises, leisure, accommodation facilities, public and private open spaces, new pedestrian and vehicular access, car parking and other associated landscape and infrastructure works including a monorail.

11.5.18 The maximum horizontal limits of the proposed development are presented in the Parameters Plan in **Appendix 2.1**. The height of most of the buildings will be 6 – 13m. The tallest buildings will be the apart-hotel at 10.5m and the Brewery in Station Square, which will be 13m. The monorail will typically be 3.5m above ground rising to 5.5m above access roads.

11.5.19 **Table 11-7** and **Table 11-8** summarise the assessment of the effects of the proposed development when complete and operational on the landscape (and wider landscape) and on views (represented by the viewpoints) within the 5km study area. They also provide an indication of whether or not these effects are considered to be significant.

Likely Significant Effects on the Landscape Within the National Park Including It's Special Qualities During Operation

11.5.20 During operation there will be direct and indirect adverse effects on the landscape within the site and its immediate setting, which falls within the National Park. Within 1km of the site, there will also be indirect adverse effects on the quality of the views both within and into/ out of the National Park. Taken together, these direct and indirect effects will be medium in scale and moderate in significance. They are, however, in the southernmost part of the National Park, in an area which has been influenced by proximity to Balloch and the presence of visitor attractions and facilities, including the Loch Lomond Shores development.

11.5.21 Although there will be permanent vegetation loss along the shoreline and around Woodbank House, the trees within Drumkinnon Woods and most of the trees within the Woodbank House area, which are a key landscape element, will be retained. Also, over time, the compensatory tree planting will further integrate the proposed development into the wider landscape and reduce its visual influence on the landscape character of the National Park.

11.5.22 During operation there is a moderate risk of loss or damage to the following Special Qualities of the National Park:

- A world-renowned landscape famed for its natural beauty;
- The rich variety of woodlands;
- Famous through-routes; and,
- Banks of broadleaved woodland.

11.5.23 It should be noted, however, that this risk applies only to a very localised area around the southern end of the loch, with the remainder of the National Park experiencing only negligible risk.

Likely Significant Effects on the Landscape Within the LCTs During Operation

11.5.24 During operation there will be direct and indirect adverse effects on the landscape within the site and its immediate setting, which falls within LCT 263: Lowland Loch Basin – Loch Lomond and the Trossachs. Within 1km of the site, there will also be indirect adverse effects on the quality of the views both within and into/ out of the LCT. Taken together, the direct and indirect effects on the southern part of LCT 263, will be medium in scale and moderate in significance.

11.5.25 Although there will be permanent vegetation loss along the shoreline and around Woodbank House, the trees within Drumkinnon Woods and most of the trees within the Woodbank House area, which are a key landscape element, will be retained. Also, over time, the compensatory tree planting will further integrate the proposed development into the wider landscape and reduce its visual influence on the landscape character of LCT 263.

Table 11-7: Summary of the Landscape Assessment - Operation

Impact and Receptor	Likely Significant Effect	Significant?
Loch Lomond and the Trossachs National Park	Potentially reversible, long-term, direct, adverse effect of moderate significance but only for a very localised area around the southern end of Loch Lomond. Moderate risk to loss or damage to the following Special Qualities – similarly only for a localised area around the southern end of Loch Lomond: ▪ A world-renowned landscape famed for its rural beauty; ▪ The rich variety of woodlands; ▪ Famous through-routes; and, ▪ Banks of broadleaved woodland.	**Significant (locally)**
LCT 263: Lowland Loch Basin – Loch Lomond & the Trossachs	Potentially reversible, long-term, direct, adverse effect of moderate significance	**Significant (locally)**
LCT 264: Lowland Loch Basin – Islands	Potentially reversible, long-term, indirect, adverse effect of minor significance	Not Significant
LCT 261: Rolling Farmland – Loch Lomond & The Trossachs	Potentially reversible, long-term, indirect, adverse effect of minor significance	Not Significant
LCT 255: Parallel Ridges - Loch Lomond & The Trossachs	Potentially reversible, long-term, indirect, adverse effect of minor significance	Not Significant

Likely Significant Effects on Views During Operation

11.5.26 During operation, significant adverse visual effects are predicted from locations within 1km of the proposed development, with moderate adverse effects identified for receptors represented by VP 01: View from Ben Lomond Way, VP 02: View from Loch Lomond Shores, VP 03: View from the Maid of the Loch Slipway, VP 09: View from Pier Road VP 25 and VP 26: Views from the southern end of Loch Lomond.

11.5.27 The only other significant effect arising from the development during operation will be beneficial and is related to the redevelopment of Station Square as represented by VP 10: View from Balloch Road. This is because the high quality of the proposals will deliver significant improvements to the public realm and local infrastructure in an area which is currently in need of improvement.

Table 11-8: Summary of the Visual Assessment - Operation

Impact and Receptor	Likely Significant Effect	Significant?
VP 01: View from Ben Lomond Way	Potentially reversible long-term, adverse effect of moderate significance	**Significant**
VP 02: View from Loch Lomond Shores	Potentially reversible long-term, adverse effect of moderate significance	**Significant**
VP 03: View from the Maid of the Loch Slipway	Potentially reversible long-term, adverse effect of moderate significance	**Significant**
VP 04: View from Woodbank House	Potentially reversible long-term, beneficial effect of minor significance	Not Significant
VP 05: View from Old Luss Road looking South East	Potentially reversible long-term, adverse effect of minor significance	Not Significant
VP 06: View from Old Luss Road looking West	Potentially reversible long-term, adverse effect of minor significance	Not Significant
VP 07	Viewpoint removed following 2018 application	-
VP 08: View from John Muir Way on the eastern bank of the River Leven	Potentially reversible long-term, neutral effect of negligible significance	Not Significant
VP 09: View from Pier Road	Potentially reversible long-term, adverse effect of moderate significance	**Significant**
VP 10: View from Balloch Road	Potentially reversible long-term, beneficial effect of moderate significance	**Significant**
VP 11	Viewpoint removed following 2018 application	-
VP 12: View from Upper Stoneymollan	Potentially reversible long-term, adverse effect of minor significance	Not Significant
VP 13a: View from the Roundabout at Vaudervale Gardens – Looking North West	Potentially reversible long-term, adverse effect of negligible significance	Not Significant
VP 13b: View from the Roundabout at Vaudervale Gardens – Looking North East	No view therefore not assessed	-
VP 14: View from Boathouse Marina near Cameron Golf Course	Potentially reversible long-term, adverse effect of minor significance	Not Significant
VP 15: View from the jetty at Proposal Beach in Balloch Country Park	Potentially reversible long-term, adverse effect of minor significance	Not Significant
VP 16	Viewpoint removed following 2018 application	-
VP 17: View from Balloch Castle in Balloch Country Park	Potentially reversible long-term, adverse effect of negligible significance	Not Significant
VP 18	Viewpoint removed following 2018 application	-
VP 19a: View from the Cruin Restaurant Jetty near Arden House	No view therefore not assessed	-

Impact and Receptor	Likely Significant Effect	Significant?
VP 19a: View from the Cruin Restaurant Jetty near Arden House	No view therefore not assessed	-
VP 21: View from Shantron Hill	No view therefore not assessed	-
VP 22: View from Footpath to Balloch Castle in Balloch Country Park	No view therefore not assessed	-
VP 23: View from Footpath to Balloch Castle in Balloch Country Park	Potentially reversible long-term, adverse effect of negligible significance	Not Significant
VP 24: View from Footpath to Balloch Castle in Balloch Country Park	Potentially reversible long-term, adverse effect of negligible significance	Not Significant
VP 25: View from Southern end of Loch Lomond	Potentially reversible long-term, adverse effect of moderate significance	**Significant**
VP 26: View from Southern end of Loch Lomond	Potentially reversible long-term, adverse effect of moderate significance	**Significant**

11.6 Further Mitigation and Enhancement

Construction Phase

11.6.1 The assessment has considered the good practice mitigation measures which will be secured via the implementation of a CEMP and monitored by an appointed ECoW. No additional mitigation measures are proposed.

Operational Phase

11.6.2 The assessment has considered the inherent mitigation measures that have been incorporated within the design and presented in the accompanying **Design and Access Statement.** No additional mitigation measures are proposed.

11.7 Residual Effects

Construction Phase

11.7.1 As no further mitigation or enhancement is proposed, the residual construction effects will be the same as the pre-mitigation effects set out in **Table 11-5 and Table 11-6**

Operational Phase

11.7.2 As no further mitigation or enhancement is proposed, the residual operational effects will be the same as the pre-mitigation effects set out in **Table 11-7 and Table 11-8**.

11.8 Monitoring

11.8.1 No post-construction monitoring is considered to be proportionate or required for this topic.

11.9 Cumulative Effects

11.9.1 A cumulative landscape and visual assessment was undertaken, as described in **Section 11.2.28** of this chapter. This assesses the likely cumulative effects of the proposed development in conjunction with the consented or reasonably foreseeable schemes described in **Chapter 2: Site and Proposed Development** and presented in **Figure 2-2**.

11.9.2 **Table 11-8** summarises the likely additional significant cumulative effects, and the likely residual cumulative effects identified within the cumulative assessment. This table focuses only on those effects considered to be significant in EIA terms - for a full list of effects on sensitive **Landscape Character Assessment in Appendix 11.3** and the Viewpoint Assessment in **Appendix 11.4**. As the construction phases will potentially be different for the proposed development and the other consented or reasonably foreseeable schemes included in the cumulative assessment, the cumulative assessment focuses on the assessment of effects of the proposed development once completed and operational. It has been undertaken on the basis of the residual effects associated with the proposed development.

11.9.3 Although the introduction of the cumulative schemes will slightly improve the view when the proposed development is operational, **Table 11-9** shows that in most cases the category of likely significant residual effects on the perception of views will not change. The exception is the redevelopment of Station Square represented by VP 10: View from Balloch Road. The proposed development alone is considered to result in a beneficial change to the current outlook. However, when combined with the Sweeney Cruises proposal, the effect is considered to remain moderate in significance, but the direction of change will be adverse. This is because of the size/ scale of the Sweeney Cruises buildings which will be prominent in the foreground along the riverfront.

Table 11-9: Cumulative Impact

Impact and Receptor	Assessment of the Proposed Development (Likely Significant Residual Effects)	Cumulative Assessment (Likely Significant Residual Cumulative Effects)
Complete and Operational Development		
Direct and indirect cumulative effects on Loch Lomond and the Trossachs National Park (including four of its Special Qualities), which will very slightly alter the character and perception of this character type	Potentially reversible, long-term adverse effect of moderate significance	Potentially reversible, long-term adverse effect of moderate significance
Direct and indirect cumulative effects on LCT 263: Lowland Loch Basin – Loch Lomond and the Trossachs), which will slightly alter the character and perception of this character type	Potentially reversible, long-term adverse effect of moderate significance	Potentially reversible, long-term adverse effect of moderate significance
Indirect cumulative effects on perception of views from Ben Lomond Way (VP01)	Potentially reversible, long-term, adverse effect of moderate significance	Potentially reversible, long-term, adverse effect of moderate significance
Indirect cumulative effects on perception of views from Loch Lomond Shores (VP02)	Potentially reversible, long-term, adverse effect of moderate significance	Potentially reversible, long-term, adverse effect of moderate significance
Indirect cumulative effects on perception of views from the Maid of the Loch Slipway (VP03)	Potentially reversible, long-term, adverse effect of moderate significance	Potentially reversible, long-term, adverse effect of moderate significance
Indirect cumulative effects on perception of views from Balloch Road (VP10)	Potentially reversible, long-term, beneficial effect of moderate significance	Potentially reversible, long-term, adverse effect of moderate significance
Indirect cumulative effects on perception of views from southern end of Loch Lomond (VP25)	Potentially reversible, long-term, adverse effect of moderate significance	Potentially reversible, long-term, adverse effect of moderate significance
Indirect cumulative effects on perception of views from southern end of Loch Lomond (VP26)	Potentially reversible, long-term, adverse effect of moderate significance	Potentially reversible, long-term, adverse effect of moderate significance

11.10 Summary

Construction

Landscape

11.10.1 Significant adverse short-term landscape effects will only be experienced very locally, within the southernmost part of the National Park and the southern part of LCT 263: Lowland Loch Basin – Loch Lomond & the Trossachs. Four of the Special Qualities of the National Park will be affected.

11.10.2 These effects will be both direct and indirect. Direct effects on the landscape will occur within the site and its immediate setting, and result from the presence of the works, including tree removal. Indirect effects will be experienced within 1km of the site and will result from the visual influence of the works being carried out within the site, as well as the presence of construction vehicles using the local road network to access the site.

Visual

11.10.3 **Figure 11-7** indicates that locations where receptors are predicted to experience significant adverse short-term visual effects during construction all lie within 1km of the site.

11.10.4 The areas which will experience the greatest visual effects during construction are Pierhead and Station Square. This is not unexpected given that these are the areas where the larger-scale construction activity will take place and the changes to peoples' views will be most apparent.

11.10.5 Geographically the most extensive views of construction activity will be related to the Pierhead development and will be experienced by receptors mainly to the north, including from the open waters of the loch. Views from much of the shoreline will be obscured by the indented landform around the edge of the loch and by the relatively discrete location of the site within Drumkinnon Bay. Elsewhere, views of the construction activity related to other parts of the proposed development will be contained at close range by buildings within Balloch and the high coverage of woodland across much of the site.

Operation

Landscape

11.10.6 Significant adverse long-term landscape effects will only be experienced very locally within the southernmost part of the National Park and the southern part of LCT 263: Lowland Loch Basin – Loch Lomond & the Trossachs. These adverse effects, which will be direct and indirect, will primarily arise from the development at Pierhead (including Pier Road) which will alter the character of the existing landscape. Four of the Special Qualities of the National Park will be affected.

11.10.7 In addition to the direct effects on the landscape, the Pierhead development will also be visible across the open waters of the loch and its visual influence will give rise to indirect adverse effects on the quality of the views both within and into/ out of the National Park and LCT 263 at a distance of up to 1km. Drumkinnon Tower will, however, remain the most prominent built feature in the landscape.

11.10.8 Although the proposed development at Pierhead will be sympathetically designed to integrate into the surrounding landscape and appear as an extension to the Loch Lomond Shores development, it will replace an area of woodland around the loch shore and along Pier Road, which will have been removed during construction. Given its location within a nationally designated landscape and the fact that broadleaved woodlands are one of the Special Qualities of the National Park, the change resulting from its presence has to be perceived as adverse.

11.10.9 Whilst the effects of the Pierhead development on the landscape within the National Park and LCT 263 are considered to be adverse, the introduction of the proposed development at Station Square will result in a significant beneficial effect. This is because the high quality of the scheme, including a new public realm will be an improvement on the current character and appearance of the site. The introduction of a cluster of new buildings of coherent architectural style and massing, will strengthen the quality of Station Square and improve its legibility as a gateway to

the National Park and the Highlands. The built development will be complemented by an attractive new public realm, in a style appropriate to its location.

11.10.10 The restoration of Woodbank House and management and enhancement of its wooded setting will improve the current run-down appearance of the Site. Bothies/ pods, woodland lodges and countryside lodges are not out of character with the southern end of the loch where there are several developments of this type, typically associated with the former estates.

11.10.11 The introduction of woodland lodges into the existing grassed area between Drumkinnon Woods and the River Leven at Riverfront, will alter the visual character of the site but it will be of equal quality and in keeping with the current landscape. Similarly, the redevelopment of the Boathouse will not have an effect on the character of its location.

Visual

11.10.12 **Figure 11-8** indicates that the locations, predicted to experience significant adverse long-term visual effects during operation, are associated with the Pierhead development and the introduction of car parking and the monorail along Pier Road.

11.10.13 Geographically the most extensive views will be related to the Pierhead development and will be experienced by receptors mainly to the north, including from the open waters of the loch within 1km. Views from much of the shoreline will be obscured by the indented landform around the edge of the loch and by the relatively discrete location of the site within Drumkinnon Bay. Elsewhere views of the other parts of the development will be contained at close range by buildings within Balloch and the high coverage of woodland across much of the site.

11.10.14 In views across Drumkinnon Bay and from the open waters of the loch there will be a very noticeable change in the view. This is because the area of existing woodland between the Maid of the Loch Steamer and Drumkinnon Tower will be replaced the three-storey apart-hotel which will extend around the shoreline. New tree planting around the building will be too immature to provide substantial screening although some retained existing trees will partially obscure views of the development.

11.10.15 The new buildings will be of a similar height and massing to the existing Loch Lomond Shores development and will appear as an extension to the existing buildings. A varied roof line and green-roof construction will also limit both their prominence and their perceived scale relative to existing development. Drumkinnon Tower will continue to be the tallest and most visible building. Nevertheless, the long-term presence of built development across much of the view rather than woodland, represents an adverse change to the current outlook.

11.10.16 The introduction of car parking and the monorail along Pier Road, combined with the loss of woodland removed during construction, will result in significant adverse effects on the views experienced by users of Pier Road and occupants of residential properties along Clairinsh Avenue. Over time, however, as the compensatory tree planting matures these effects will reduce.

11.10.17 Significant beneficial effects are associated with the Station Square development, particularly when seen from Balloch Bridge, which is one of the key locations where visitors stop to appreciate the view north along the River Leven towards the Highlands. The only adverse effects will be experienced by occupants of the residential properties along the southern end of Pier Road who currently have open views across Station Square towards the River Leven. Due to their proximity to the proposed development and the loss of trees, which were removed during construction, these residents will experience long-term, adverse significant effects.

11.10.18 There will be no significant visual effects arising from the proposed development at Woodbank House either on users of the A82 and Old Luss Road, occupants of nearby residential properties, or receptors at Upper Stoneymollan. This is because the restoration of Woodbank House and management and enhancement of its setting will improve the quality of the views experienced, while the bothies and woodland lodges will be in keeping with similar developments in the locality.

11.10.19 At Riverfront, the introduction of woodland lodges into the existing grassed area between the woodland will change the appearance of the site and introduce more activity and movement, but its character will be of equal quality and in keeping with similar developments in the locality. The redevelopment of the Boathouse and the Staff Area will not give rise to a significant adverse effect on views.

11.10.20 In middle and long-distance views, the appreciable screening afforded by the high coverage of woodlands and the built-up edge of Balloch to the south will typically minimise any effects of the proposed development on views with the result that no significant visual effects are predicted to arise. This includes transient views from the footpath leading up to Balloch Castle through the Country Park to the east and from higher land at Upper Stoneymollan to the west.

Cumulative

11.10.21 No significant cumulative effects are identified other than the view of Station Square from Balloch Road. Here, the combined effect of the Sweeney Cruises proposals with the proposed development is considered to result in an adverse change to the current outlook. However, this is primarily because of the prominence of the Sweeney Cruises buildings rather than the proposed development, which alone is considered to be beneficial.

11.10.22 **Table 11-10** summarises the likely significant effects, identified mitigation measures and the likely residual effects identified within this chapter. This table focuses only on those effects considered to be significant in EIA terms - for a full list of effects on sensitive receptors (including those not considered significant in EIA terms) please refer to **Table 11-5** to **Table 11-8**.

Table 11-10: Summary of Likely Significant Effects, Mitigation Measures and Likely Residual Effects

Impact and Receptor	Likely Significant Effect	Identified Mitigation	Likely Residual Effect	Likely Cumulative Effect
Construction				
Direct and indirect effects on Loch Lomond and the Trossachs National Park including on four of its Special Qualities due to construction activity,	Reversible, short-term, indirect, adverse effect of moderate significance	No additional mitigation proposed other than that identified in the CEMP	Reversible, short-term, indirect, adverse effect of **moderate** significance	Not assessed during construction as timescales for other developments unknown
Direct and indirect effects on LCT 263: Lowland Loch Basin – Loch Lomond & the Trossachs due to the construction activity	Reversible, short-term, direct, adverse effect of moderate significance	No additional mitigation proposed other than that identified in the CEMP	Reversible, short-term, direct, adverse effect of **moderate** significance	Not assessed during construction as timescales for other developments unknown
Indirect effects on perception of views from Ben Lomond Way (VP01) due to construction activity	Reversible, short-term, adverse effect of major significance	No additional mitigation proposed other than that identified in the CEMP	Reversible, short-term, adverse effect of **major** significance	Not assessed during construction as timescales for other developments unknown
Indirect effects on perception of views from Loch Lomond Shores (VP02) due to construction activity	Reversible, short-term, adverse effect of major significance	No additional mitigation proposed other than that identified in the CEMP	Reversible, short - term, adverse effect of **major** significance	Not assessed during construction as timescales for other developments unknown
Indirect effects on perception of views from the maid of the Loch Slipway (VP03) due to construction activity	Reversible, short-term, adverse effect of major significance	No additional mitigation proposed other than that identified in the CEMP	Reversible, short - term, adverse effect of **major** significance	Not assessed during construction as timescales for other developments unknown

Impact and Receptor	Likely Significant Effect	Identified Mitigation	Likely Residual Effect	Likely Cumulative Effect
Indirect effects on perception of views from Woodbank House (VP04) due to construction activity	Reversible short-term, adverse effect of moderate significance	No additional mitigation proposed other than that identified in the CEMP	Reversible short-term, adverse effect of **moderate** significance	Not assessed during construction as timescales for other developments unknown
Indirect effects on perception of views from Old Luss Road looking South East (VP05) due to construction activity	Reversible, short-term, adverse effect of moderate significance	No additional mitigation proposed other than that identified in the CEMP	Reversible, short-term, adverse effect of **moderate** significance	Not assessed during demolition and construction as timescales for other developments unknown
Indirect effects on perception of views from Old Luss Road looking West (VP06) due to construction activity	Reversible, short-term, adverse effect of moderate significance	No additional mitigation proposed other than that identified in the CEMP	Reversible, short-term, adverse effect of **moderate** significance	Not assessed during demolition and construction as timescales for other developments unknown
Indirect effects on perception of views from John Muir Way on the eastern bank of the River Leven (VP08) due to construction activity	Reversible, short-term, adverse effect of moderate significance	No additional mitigation proposed other than that identified in the CEMP	Reversible, short-term, adverse effect of **moderate** significance	Not assessed during demolition and construction as timescales for other developments unknown
Indirect effects on perception of views from Pier Road (VP09) due to construction activity	Reversible, short-term, adverse effect of moderate significance	No additional mitigation proposed other than that identified in the CEMP	Reversible, short-term, adverse effect of **moderate** significance	Not assessed during demolition and construction as timescales for other developments unknown
Indirect effects on perception of views from Balloch Road (VP10) due to construction activity	Reversible, short-term, adverse effect of major significance	No additional mitigation proposed other than that identified in the CEMP	Reversible, short-term, adverse effect of **major** significance	Not assessed during demolition and construction as timescales for other developments unknown
Indirect effects on perception of views from Boathouse Marina near Cameron Golf Course (VP14) due to construction activity	Reversible, short-term, adverse effect of moderate significance	No additional mitigation proposed other than that identified in the CEMP	Reversible, short-term, adverse effect of **moderate** significance	Not assessed during demolition and construction as timescales for other developments unknown
Indirect effects on perception of views from the jetty at Proposal Beach in Balloch Country Park (VP15) due to construction activity	Local, reversible, short-term, adverse effect of moderate significance	No additional mitigation proposed other than that identified in the CEMP	Local, reversible, short-term, adverse effect of **moderate** significance	Not assessed during demolition and construction as timescales for other developments unknown

Impact and Receptor	Likely Significant Effect	Identified Mitigation	Likely Residual Effect	Likely Cumulative Effect
Indirect effects on perception of views from the southern end of Loch Lomond (VP25) due to construction activity	Reversible, short-term, adverse effect of major significance	No additional mitigation proposed other than that identified in the CEMP	Reversible, short-term, adverse effect of **moderate** significance	Not assessed during demolition and construction as timescales for other developments unknown
Indirect effects on perception of views from the southern end of Loch Lomond (VP26) due to construction activity	Reversible, short to medium-term, adverse effect of major significance	No additional mitigation proposed other than that identified in the CEMP	Reversible, short-term, adverse effect of **major** significance	Not assessed during demolition and construction as timescales for other developments unknown
Complete and Operational Development				
Direct and indirect effects on Loch Lomond and the Trossachs National Park including on four of its Special Qualities due to the presence of the proposed development	Potentially reversible, long-term, adverse effect of moderate significance	No additional mitigation proposed other than that identified in the CEMP	Potentially reversible, long-term, adverse effect of **moderate** significance	Potentially reversible, long-term, adverse effect of **moderate** significance
Direct and indirect effects on LCT 263: Lowland Loch Basin – Loch Lomond & the Trossachs due to the presence of the proposed development	Potentially reversible, long-term, adverse effect of moderate significance	No mitigation proposed	Potentially reversible, long-term, adverse effect of **moderate** significance	Potentially reversible, long-term, adverse effect of **moderate** significance
Indirect effects on perception of views from Ben Lomond Way (VP01) due to presence of the proposed development	Potentially reversible, long-term, adverse effect of moderate significance	No mitigation proposed	Potentially reversible, long-term, adverse effect of **moderate** significance	Potentially reversible, long-term, adverse effect of **moderate** significance
Indirect effects on perception of views from Loch Lomond Shores (VP02) due to presence of the proposed development	Potentially reversible, long-term, adverse effect of moderate significance	No mitigation proposed	Potentially reversible, long-term, adverse effect of **moderate** significance	Potentially reversible, long-term, adverse effect of **moderate** significance
Indirect effects on perception of views from the maid of the Loch Slipway (VP03) due to presence of the proposed development	Potentially reversible, long-term, adverse effect of moderate significance	No mitigation proposed	Potentially reversible, long-term, adverse effect of **moderate** significance	Potentially reversible, long-term, adverse effect of **moderate** significance
Indirect effects on	Potentially reversible,	No mitigation	Potentially	No proposals likely

Impact and Receptor	Likely Significant Effect	Identified Mitigation	Likely Residual Effect	Likely Cumulative Effect
perception of views from Pier Road (VP09) due to presence of the proposed development	long-term, adverse effect of moderate significance	proposed	reversible, long-term, adverse effect of **moderate** significance	to give rise to cumulative effects
Indirect effects on perception of views from Balloch Road (VP10) due to presence of the proposed development	Potentially reversible, long-term, beneficial effect of moderate significance	No mitigation proposed	Potentially reversible, long-term, beneficial effect of **moderate** significance	Potentially reversible, long-term, adverse effect of **moderate** significance
Indirect effects on perception of views from the southern end of Loch Lomond (VP25) due to presence of the proposed development	Potentially reversible, long-term, adverse effect of moderate significance	No mitigation proposed	Potentially reversible, long-term, adverse effect of **moderate** significance	Potentially reversible, long-term, adverse effect of **moderate** significance
Indirect effects on perception of views from the southern end of Loch Lomond (VP26) due to presence of the proposed development	Potentially reversible, long-term, adverse effect of moderate significance	No mitigation proposed	Potentially reversible, long-term, adverse effect of **moderate** significance	Potentially reversible, long-term, adverse effect of **moderate** significance

11.11 References

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12 Traffic and Transport

12.1 Introduction

12.1.1 This EIAR chapter provides an assessment of the likely significant effects on the traffic, transport and access, arising from the Lomond Banks Planning Permission in Principle (PPiP) development proposal. It incorporates the findings of the Transport Assessment (TA).

12.1.2 The aims of this chapter are to:

- Identify the relevant context in which the TA has been undertaken;
- Describe the methods used to undertake the assessment;
- Outline the relevant baseline conditions currently existing at the site and surroundings;
- Identify the potential direct and indirect traffic and transport effects of the proposed development;
- Identify mitigation and enhancement measures where required to address identified effects;
- Assess residual predicted effects; and,
- Assess cumulative effects on the local and trunk road network from the proposed development in combination with other relevant cumulative developments.

12.2 Legislation, Policy Context and Guidance

Legislation

12.2.1 The overarching legislative framework applicable to this EIA for the proposed development is outlined in **Chapter 4 – Legislative and Planning Policy Context**.

Policy

12.2.2 The planning policy framework applicable to this EIA for the proposed development is outlined in **Chapter 4 – Legislative and Planning Policy Context**. Planning policy considerations of specific relevance to this assessment are:

- Scottish Planning Policy (SPP);
- A Catalyst for Change - The Regional Transport Strategy for the West of Scotland 2008-2021, Strathclyde Partnership for Transport (SPT);
- Loch Lomond & the Trossachs National Park (LLTNP) – Local Development Plan, 2017-2021; and,
- West Dunbartonshire Local Transport Strategy, 2013 – 2018.

12.2.3 Other policy considerations of relevance to this assessment are:

- Designing Streets, Scottish Government, 2010; and,
- Cycling by Design, Transport Scotland, 2021.

Guidance and Relevant Technical Standards

12.2.4 The following guidance and technical standards have informed this assessment:

- Transport Assessment Guidance 2012 – produced by Transport Scotland to guide the preparation of Transport Assessments for development proposals in Scotland, for which the planning and transport policy are contained within Scottish Planning Policy (SPP). The guidance provides an outline of the framework for delivering integration of transport and land use planning, including the requirements for a Transport Assessment, of development involved with significant travel generating uses; and,
- SCOTS National Roads Development Guide (NRDG) 2015 – produced by the Society for Chief Officers of Transport in Scotland, supported by Transport Scotland and Scottish

Government Planning and Architecture Division. This document supports Designing Streets and expands on its principles to clarify the circumstances in which it can be used.

12.3 Study Methodology

Scope of Assessment

12.3.1 This chapter presents an assessment of likely significant effects on the local and trunk road network from the proposed development. The assessment presented has been prepared in accordance with the 2017 EIA Regulations.

12.3.2 The principal aspects considered within this assessment include:

- Changes in vehicle flows and usage patterns within the road network;
- Associated amenity and environmental effects, including:
- Severance;
- Driver delay;
- Pedestrian and Cyclist Delay;
- Pedestrian and Cyclist Amenity;
- Fear and intimidation;
- Driver delay; and,
- Accidents and safety.

Overall Approach

12.3.3 In undertaking the assessment presented, the following activities have been carried out:

- EIA screening and scoping (see below);
- Scoping discussions and correspondence with West Dunbartonshire Council (WDC Roads Officers and Transport Scotland (TS);
- Desk-based review of available information including previous studies;
- A site-visit, walkover and cycle of the site and surrounding pedestrian, cycle and local road network;
- Traffic data collection;
- Evaluation of the baseline and baseline + development scenario traffic conditions;
- Production of a Transport Assessment (TA) for the proposed development; and,
- Identification and assessment of likely significant effects, taking into account proposed mitigation and enhancement measures and including consideration of likely cumulative effects.

12.3.4 The assessment has been informed by the EIA Screening and Scoping Report by Peter Brett Associates (now Stantec) in April 2017) and subsequent EIA Screening and Scoping Opinion issued by LLTNPA (May 2017) in respect of the EIA for the previously proposed development at Lomond Banks (application ref: 2018/0133/PPP).

12.3.5 The EIA Scoping Opinion indicated that WDC had requested that "*Parking for the development should conform to the appropriate standards set out in WDC Parking Standards*". Later scoping discussions in October 2017 requested a revision to this to accord with SCOTS NRDG parking standards. WDC have since updated their Parking Standards in October 2019. The proposed development has therefore been assessed against WDC's updated parking standards, with NRDG standards used where no standard for a certain use (hotels) is not provided in the Council's standards.

12.3.6 Consultation was also undertaken with ScotRail Abellio to agree in principle the mutual benefits of promoting access to the development site by rail. Whilst any interventions are still in early developmental stages, options for shared-ticketing, marketing and the need for future studies is being explored further.

12.3.7 Consultation was undertaken with respect to the Balloch Village Parking Proposals and, more specifically, the streetscape improvements proposed as part of the Station Square Proposals for Balloch Road. WDC has indicated that any future refinement of the streetscape proposals will be informed through collaborative working with the proposed developer, to develop a scheme which will meet the needs of WDC and the design requirements of the Zone A Station Square area of the development proposals. It is expected that this scheme will progress collaboratively between WDC, SUSTRANS and the developer.

Study Area

12.3.8 The study area in the TA is consistent with that set out in 'the EIA Screening and Scoping Report' and 'the EIA Scoping Opinion', with key junctions between the Drymen Road/A811 Stirling Road Priority junction to the east and the A82/A811 Stoneymollan Roundabout to the west, being identified and agreed for assessment with WDC and TS. These junctions, as listed below under "Extent of Assessment", are those junctions expected to experience an uplift in through traffic volumes as a result of the development.

Information Sources

Desk Top Study

12.3.9 The following sources were used within the Transport Assessment:

- Scottish Planning Policy (SPP);
- A Catalyst for Change - The Regional Transport Strategy for the West of Scotland 2008-2021, Strathclyde Partnership for Transport (SPT);
- Loch Lomond & the Trossachs National Park (LLTNP) – Local Development Plan, 2017-2021;
- West Dunbartonshire Local Transport Strategy, 2013 – 2018;
- Designing Streets, Scottish Government, 2010;
- Cycling by Design, Transport Scotland, 2021;
- Transport Assessment Guidance 2012;
- SCOTS National Roads Development Guide 2015 – produced by the Society for Chief Officers of Transport in Scotland, supported by Transport Scotland and Scottish Government Planning and Architecture Division. This document supports Designing Streets and expands on its principles to clarify the circumstances in which it can be used;
- www.crashmap.co.uk;
- TRICS V7.9.1 trip generation database;
- ARCADY Roundabout junction analysis software;
- PICADY Priority junction analysis software; and,
- STEP Scottish Trip End User Programme software application.

12.3.10 A desk top study was undertaken to inform the policy review of the TA, as well as gathering supporting information on existing public transport services and timetables for bus and rail services adjacent to the development site.

Fieldwork

12.3.11 Fieldwork was undertaken in the form of site visits by walking, cycling and private vehicles of the development site and surrounding local area. Traffic data was also collected to inform baseline traffic flows.

12.3.12 To determine the existing traffic conditions on the study network a series of Junction Turning Counts (JTCs) were undertaken over Thursday 7th September 2017 and Saturday 9th September 2017 at all junctions noted above. Traffic surveys were undertaken in accordance with an agreed survey specification.

12.3.13 To inform the TA and the noise and air quality assessment to support the Environmental Assessment, a seven-day Automatic Traffic Count (ATC) survey was also undertaken from

Thursday 7th September 2017 to Wednesday 12th September 2017, inclusive to record existing traffic link flows, vehicle composition and traffic speeds.

12.3.14 Subsequently, traffic surveys of the following junctions within the study area were carried out again on Thursday 18th November and Saturday 20th November 2021 to assess the validity of the 2017 traffic survey results.

- A82 / A811 – Stoneymollan Roundabout; and,
- A811, Ben Lomond Way Roundabout.

12.3.15 The results of the 2021 surveys demonstrated that traffic flows were higher during 2017. It was therefore agreed with WDC to base the traffic, noise and air quality assessments on the 2017 traffic surveys to provide a robust assessment.

Approach to Assessment

Identification of Relevant Receptors

12.3.16 Scoping was undertaken with West Dunbartonshire Council (WDC) Road Officers and Transport Scotland (TS). Preliminary scoping was undertaken with WDC and TS during the preparatory stages of the Planning Application Notice (PAN) for the previous planning application, submitted in October 2017 for the previous proposals. As the development proposals have evolved to reflect land use constraints, more detailed Scoping was undertaken with both TS and WDC to confirm the assessment parameters of the TA.

12.3.17 The TA was prepared in accordance with the Scoping agreed with WDC Road Officers in October 2017 and again in October 2021 for the current development proposals and with TS in March 2018. As such, the following assessment parameters were established:

Extent of Assessment

12.3.18 The extent of the TA is defined by the following junctions:

- Ben Lomond Way/ Loch Lomond Shores Roundabout (internal);
- Ben Lomond Way, Old Luss Road, Balloch Road Roundabout;
- A811, Ben Lomond Way Roundabout;
- A82/ A811 Stoneymollan Roundabout;
- A811/ Carrochan Cres Roundabout;
- Pier Road/ Balloch Road Priority;
- Balloch Road/ Drymen Road/ Carrochan Road Priority; and,
- Drymen Road/ A811 Stirling Road Priority.

Year of Assessment

12.3.19 A year of opening assessment of 2030 was based on all development being operational in accordance with Transport Assessment Guidance 2012. Given the time between the traffic surveys carried out in 2017 and a year of assessment of 2030, a factor was applied to the 2017 surveys to reflect an increase in traffic over a period of 13 years.

Assessment Period

12.3.20 The assessment periods for the proposed development are:

- Weekday AM Network Peak (08:00-09:00);
- Weekday PM Network Peak (16:30-17:30); and,
- Weekend/ Saturday Network Peak (15:15-16:15).

Trip Generation

12.3.21 Trip generation has been based on the use of the TRICS V7.9.1 database for all proposed development land uses for both the weekday and weekend.

Trip Distribution

12.3.22 Development trips have been assigned to the network on the basis of the existing turning proportions of vehicles on the network. This was considered to be the most robust approach given the nature of trips associated with the existing activities at: Old Luss Road; Loch Lomond Shores; Pierhead; and the West Riverside car park (to become Zone A Station Square) and adjacent to WDC/ SUSTRANS planned Station Square Proposals.

Junction Analysis

12.3.23 Junction capacity assessments have been undertaken using industry standard software PICADY, for priority junctions and ARCADY, for roundabouts junctions.

12.3.24 Each junction included in the extent of assessment has been assessed during the Weekday AM and PM peak and Weekend (Saturday) peak under the following conditions: 2030 Baseline Traffic Flows; and 2030 Baseline + Proposed Development Traffic Flows.

12.3.25 The ARCADY and PICADY computer models can split the peak period under consideration into a series of 15-minute time segments in order to simulate the likely arrival pattern of traffic more effectively. Research indicates that the peak Ratio to Flow Capacity (RFC) values returned in any individual peak (i.e. the peak capacity and corresponding queue results) are likely to be observed over the central 15-30 minute period for the hour.

12.3.26 RFC values between 0.00 and 0.85 are generally accepted as representing stable operating conditions, values between 0.85 and unity represent variable operation (i.e. possible queues building up at the junction during the period under consideration and increases in vehicle delay moving through the junction). RFC values in excess of unity represent possible congested conditions.

Assessment Methodology Guidance

12.3.27 The assessment of the likely significant transport effects has been undertaken using established methodologies and has concentrated on examining the capacity of relevant local transport infrastructure to accommodate the proposed development. It has been undertaken in accordance with the guidance set out within the Institute of Environmental Assessment (IEA) document 'Guidelines on the Environmental Assessment of Road Traffic (Guidance Note 1)', 1993.

12.3.28 In line with IEA guidelines, further assessment will be undertaken on:

- Road links where traffic flows will increase by more than 30% (or the number of HGVs will increase by more than 30%); and,
- Any specifically sensitive areas where the traffic flows have increased by 10% or more.

12.3.29 Any non-road based transport infrastructure (e.g. national cycle roads) where likely effects from the proposed development have the potential to be significant.

Effect on Pedestrians

Severance

12.3.30 Severance is defined as the perceived division that can occur within a community when it becomes separated by a major traffic artery and describes a complex series of factors that separate people from places and other people. Such division may result from the difficulty of crossing a heavily trafficked road or a physical barrier created by the road itself.

Pedestrian & Cyclist Delay

12.3.31 The IEMA guideline note that changes in the volume, composition and or speed of traffic may affect the ability of pedestrians and cyclists to cross the roads. Typically, this increase in traffic levels result in increased pedestrian and/ or cyclist delay, although increased pedestrian and cycle activity also contributes. The guidelines do not set any thresholds, recommending instead that assessors use their judgement to determine the significance of effect.

Pedestrian & Cyclist Amenity

12.3.32 Pedestrian and cyclist amenity is defined as the relative pleasantness of a journey which, as with pedestrian and cyclist delay, is affected by traffic volumes and composition along with foot

and cycle way width and pedestrian and cyclist activity. The guidelines suggest tentative thresholds of significance would be where the traffic flows are doubled or halved.

Fear and Intimidation

12.3.33 The IEMA guidelines note that a further effect of traffic may have on pedestrians is fear and intimidation, the impact of which is dependent on volumes of heavy vehicular traffic, its proximity to people or a lack of protection caused by such factors as narrow pavements.

Effect on Road Users

Driver Delay

12.3.34 The IEMA guidelines note that driver delay to non-development traffic can occur at several points on the network, although the effects are only likely to be significant when the traffic on the road network is predicted to be at or close to the capacity of the system: typically during commuter periods. Values for delay are determined through ARCADY, PICADY and LINSIG junction modelling software to obtain detailed output on a range of traffic parameters including flows and average delay.

Accidents and Safety

12.3.35 IEMA guidelines do not include any definition in relation to accidents and safety, suggesting that professional judgement would be needed to assess the implications of local circumstances, or factors which may increase or decrease the risk of accidents.

Assumptions and Limitations

12.3.36 The limitations of the TA methodology are:

- Trip generation rates have been taken for proposed development land uses operating as individual entities, and do not account for shared trips either between the existing and proposed land uses or the newly proposed land uses. Trip-sharing will occur and so the TA is robust in traffic impact terms, but may overestimate the effects on receptors;
- The full extent of development traffic trips has been assessed in a 2030 scenario and, as such, represents a worst-case assessment scenario. A future operational year of assessment could be anticipated to have higher baseline flows, against which the % impact of development traffic trips would be lessened. As above, this adds to the robustness of the TA in traffic impact terms, but may overestimate on receptors; and,
- The TA assumes a routing strategy for all development traffic trips which is based on the principles of making best use of the road hierarchy and seeking to minimise through-traffic trips in the village of Balloch. Whilst the external network routing is likely to be applicable in the future, the internal network and routing strategy may change in the future to account for refinement of the proposed parking locations and an associated internal access strategy. As such, this assessment may over or under-estimate the effects on receptors on internal/ access routes to the site.

Establishment of Effect Significance

12.3.37 Potential and residual effects will be defined in accordance with **Table 12-1**.

Table 12-1:Nature of Effects

Nature	Description
Beneficial	Meaning that they are expected to produce environmental benefits in transportation terms, i.e. where overall traffic flows or percentage HGV movements decrease, or there are improved facilities for pedestrians, cyclists or public transport users.
Negligible	Meaning that expected changes are too small to meaningfully measure, i.e. where changes in flows are typically less than 10%.
Adverse	Meaning that they are expected to produce environmental disbenefits in transportation terms, e.g. where overall traffic flows or percentage HGV movements increase, or there are reductions in facilities for pedestrians, cyclists or public transport users.

12.3.38 Beneficial and adverse effects will be further characterised in accordance with **Table 12-2**.

Table 12-2: Magnitude of Effects

Magnitude	Description
Minor	Slight very short or highly localised changes of no significance and/or where changes in traffic flows/patterns are between 10% and 30%.
Moderate	Limited change by extent, duration or magnitude which may be considered significant and/or where changes in traffic flows/patterns are between 30% and 60%.
Major	Considerable change by extent, duration or magnitude of more than local significance or in breach of recognised acceptability, legislation, policy or standards, and/or where changes in traffic flows/patterns are greater than 60%.

12.3.39 Where predicted increases in traffic flows are lower than the percentage based thresholds, the IEMA guidelines suggest that the significance of effects can be stated to be low or insignificant and further detailed assessments are not required.

Approach to Cumulative Impact Assessment

12.3.40 A separate cumulative assessment is not being provided for traffic, transport and access due to agreement with WDC Road Officers that committed development flows were not required for the TA.

12.4 Baseline Conditions

Pedestrian Facilities

12.4.1 The proposed development site is accessible by foot along the existing main vehicular access routes to the site, as well as the NCN 7 towpath along the western side of the River Leven and west bank of the site, dedicated pedestrian routes through Lomond Shores and the footways and links to the John Muir Way. This section considers the following routes:

- Pier Road;
- Ben Lomond Way;
- Lomond Shores Internal Routes;
- Old Luss Road; and,
- John Muir Way.

Pier Road

12.4.2 Pier Road is an un-adopted private road providing primarily vehicle access to the Pierhead area (northern extents) of the proposed development site, where there is an operational slipway into Loch Lomond. As such, this route provides for functional access to the slipway and associated activities and, whilst a relatively direct route from Balloch into the site, the lack of footways on the route combined with dense brush and tree cover, is such that it has limited function as a walking route due to perceived safety and security issues. There is no lighting provided on this route, with the exception of the southerly extents adjacent to a handful of residential properties and the interface with Balloch Road.

Ben Lomond Way

12.4.3 Ben Lomond Way is the main vehicular access route into the Lomond Shores site from the western extents of the West Riverside component of the site. It provides an “Avenue-esque” connection from Balloch Road into Lomond Shores, as a function of strong landscaping defined by Beech hedges and a tree-lined, remote pedestrian route into Drumkinnon Woods and further north into the immediate Lomond Shores site. This is a well-lit, circa 2m wide pedestrian route and is favoured by many local people accessing the site and/ or the network of informal woodland trails through Drumkinnon Woods. This route links continuously with footways on Balloch Road and, whilst there are no controlled pedestrian crossing points, there is a dedicated, dropped-kerb with tactile paving to the east of Ben Lomond Roundabout. Further, there is a

dedicated crossing location on Ben Lomond Way itself, just north of Ben Lomond Roundabout, providing continuous pedestrian access to Old Luss Road (north and south).

Loch Lomond Shores Internal Routes

12.4.4 Much of the Lomond Shores site is pedestrianised and facilitates movements on foot for all nature of users through large areas of the site. The main pedestrianised areas, remote from vehicular routes, include: around the "bay" and beached area to the west of the Pierhead area; to the rear and frontage of the commercial units; the route which skirts the north-western boundary of the car park and connects to Old Luss Road to the west; and a network of raised board-walk paths through woodland to the north of the Lomond Shores main area.

12.4.5 Notwithstanding the board-walk paths, the main pedestrianised areas are generally wide and well surfaced and capable of accommodating a reasonable volume of two-way pedestrian flow. These are also well lit. At a minimum, for example to the rear of the retail units, the footway is circa 2m wide.

12.4.6 The board-walk paths through the woodlands to the north of the site are raised walk way of circa 2m wide and textured to avoid slipping hazards. Some of the routing is tight and angular but provide reasonable opportunity for passing.

12.4.7 Ben Lomond Way – internal to the Lomond Shores area – provides a continuous 2m footway along the southern side of the road, connecting the Ben Lomond Way/ Lomond Shores access roundabout with the Pierhead area of the site, and Pier Road. The route is lit on the northern side, where there is no continuous footway, albeit sections of the route are paved on the north side to facilitate access into the main pedestrianised area from a coach drop off area and a layby for disabled-users drop-off. CCTV security cameras are located on the route and orientated on the link into the main pedestrianised area of Lomond Shores and the service access area.

12.4.8 A dedicated, pedestrian crossing with barriers on the approach to the carriageway, is located to the south west of the commercial units, to allow onward connection to Drumkinnon Woods and the main entrance footway in to the site, on Ben Lomond Way.

Old Luss Road

12.4.9 Old Luss Road is located to the east of the Woodbank House site and to the south of the Lomond Shores area. Access from Lomond Shores to Old Luss Road is provided by the internal remote pedestrian footway to the north of the Lomond Shores car park: wooden bollards prevent vehicle access from Old Luss Road. Old Luss Road provides for onward pedestrian connections to the west towards the more rural Upper Stoneymollan and John Muir Way and, to the east, the suggested cycling section for the John Muir way.

12.4.10 The low volumes of traffic on the route, as a result of a "no-through-route" to vehicles to the north, gives rise to the route being used as a pedestrian link between Balloch and Cameron House and Duck Bay Marina to the north. A continuous footway is provided on the eastern side of the road, albeit foliage growth and lack of maintenance, is such that this largely overgrown and rough underfoot. This is not noted to be a deterrent to pedestrians who continue to make use of the relatively wide and reasonably surfaced carriageway, for walking (and cycling). There is no street lighting along the section of route between the Lomond Shores site and where the carriageway terminates to the north.

12.4.11 The southern extents of Old Luss Road provide reasonable quality, circa 2m wide and lit footways connecting to Ben Lomond Road Roundabout and Ben Lomond Way on the east. Lighting is more extensive on the east side of Old Luss Road, but with some lighting provision on the west side at the more southerly extents of the road.

John Muir Way

12.4.12 The John Muir Way is a coast to coast predominantly rural route and core path for walkers (and cyclists) which stretches 134 miles between Helensburgh in the west, through to Dunbar on the east coast of Scotland. The route is divided into 10 sections, with the Helensburgh to Balloch and Balloch to Strathblane sections, being of relevance to the proposed development site.

12.4.13 The John Muir Way comes into the proposed development site's area of influence, via Upper Stoneymollan, over the A82 footbridge and linking to a single-track access road which skirts the southern boundary of the Woodbank House site. At the interface of this route with Old Luss

Road, walkers are signed north towards the pedestrian link from Old Luss Road in to the Lomond Shores site. Thereafter, the route follows the internal pedestrian routes of Lomond Shores towards the west bank of the River Leven and follows this route south to Balloch Bridge. From here the route enters Balloch Castle Country Park on the east bank of the River Leven and meanders north and eastwards through Boturich, intercepts the A811 Stirling Road, and on towards Auchencarroch Road (providing connections to Gartocharn, Croftamie and Drymen).

Cycling Facilities

NCN Route 7

12.4.14 National Cycle Network (NCN) Route 7 links Sunderland in England to Inverness in the north. The 601mile route in its entirety forms part of the wider Lochs & Glens (north) cycle route which passes through two national parks - Loch Lomond & The Trossachs and Cairngorms. The route leaves Glasgow by following the River Clyde to Dumbarton and then heads to Inverness via Aberfoyle, Callander, Killin, Pitlochry, Kingussie, Aviemore and Carrbridge.

12.4.15 In relation to the proposed development side, NCN Route 7 follows the west bank of the River Leven and approaches the proposed development site from the south, via Sweeney's Cruises adjacent to Balloch Bridge. There is a main dedicated path – shared with walkers – but an alternative meandering unsurfaced route, which takes cyclists adjacent to the west river bank, through trees and scrub. This links directly to the Pierhead area and onwards to Loch Lomond Shores main.

West Loch Lomond Cycle Way

12.4.16 The West Loch Lomond Cycle Way starts at the Visit Scotland Visitor Centre in Balloch, adjacent to Balloch Bridge and Sweeney's Loch Cruises. It's an "easy" waymarked route suitable for most abilities of cyclist and follows part of the John Muir Way, along the west river bank of the proposed development site area. From the Pierhead area, cyclists are directed through the off-road shared pedestrian routes through Lomond Shores and west wards to Old Luss Road via the wide remote foot and cycleway to the north of the car park. From Old Luss Road, cyclists are directed along a route which skirts Loch Lomond side and, from Arden roundabout can continue adjacent to the A82 (off-road) or through an alternative route through the Carrick Golf Course. A short on-road section through the former Luss access road, takes cyclists through to Luss, thereafter, the route remains off-road as far north as Tarbet.

General Cycle Network

12.4.17 There are no other dedicated off-road cycle routes within the local urban area. Given the nature of the location and relatively low number of pedestrians, most routes highlighted above for the pedestrian environment will be used by both walkers and cyclists, with mutual acceptance of users on both parts. On-road cycle routes are limited, noting that the approach to the pedestrian crossing facility on Ben Lomond Way, appears to dedicate both lanes of the carriageway, to cycle priority. This is not noted elsewhere in the area and is therefore assumed to have been provided on the basis of this section of route being provided primarily for service vehicle access (and, potentially, relatively lower levels of vehicles). There is no continuum of this route noted elsewhere on the local network.

12.4.18 In the wider locality, including John Muir Way to the west and off-road routes through Whinny Hill Woods and Boturich to the east, routes are generally used by both walkers and cyclists – particularly, local mountain bikers and leisure cyclists.

12.4.19 Cyclists are able to use the recommended walking route for the John Muir Way as described above, however, an alternative cycling section is suggested on the Section 1 route maps which follows the NCN Route 7 trail. This remains an off-road section and directs cyclists towards the Cross Keys roundabout on the B832, and then east to Arden Roundabout (A82). Here the route links with a shared foot and cycle way, which skirts the A82, the west bank of Loch Lomond and continues south to link with Old Luss Road. From here, cyclists and walkers, can tie back into the dedicated route at Lomond Shores and continue west and south.

Public Transport

Balloch Railway Station

12.4.20 Balloch railway station is located approximately 100 metres to the south of the proposed development on Tullichewan Road. The station can be accessed via the established footpaths

in the surrounding area. Sheltered cycle storage is available with 22 bicycle parking spaces. On-street parking is available from Tullichewan Road.

12.4.21 Train services run half hourly on Monday to Saturday from Balloch to Airdrie via Singer and Glasgow Queen Street. Sunday services run via Yoker and Glasgow Central and then alternately to Motherwell via Whifflet and to Larkhall on an hourly basis.

12.4.22 **Table** 12-3 provides a summary of existing train services at Balloch Rail Station.

Table 12-3: Train Services Summary

Service	Destination	Journey Time (Minutes)	Frequency (Services Per Hour)
Monday to Saturday	Glasgow Queen Street	47	2
Monday to Saturday	Airdrie via Glasgow Queen Street	79	2
Sunday	Glasgow Central	46	2
Sunday	Larkhall	85	1
Sunday	Motherwell via Glasgow Central	83	1

Bus Services

12.4.23 Bus stops are located on both sides of Balloch Road adjacent to the proposed southern site boundary. Bus stops are serviced by the number 1/1A//1E bus services (First Greater Glasgow), which travels between Balloch and Glasgow, with 1A via Vale of Levien Hospital and 1E via Clydebank. Service 206 (First Greater Bus) runs from Haldane to Westcliff, via Balloch.

12.4.24 The 207, 305, 306 and 309 bus services (Garelochhead Coaches) also run from Balloch. The number 207 provides a circular service between Balloch and Alexandria. The 305, 306 and 309 bus services to Balloch to Alexandria, via Luss, Helensburgh and Balmaha respectively.

Table 12-4: Bus Services Summary

Service	Operator	Route	Nearest Bus Stop	Journey Time	Service
1/1A/1E	First Greater Glasgow	Balloch – Glasgow City Centre	Balloch Bus Terminus	85 to 99	4
206	First Glasgow	Balloch - Westcliff	Balloch Bus Terminus	46	4
207*	Garelochhead Coaches	Alexandria Circular	Loch Lomond Shores	49	1
305*	Garelochhead Coaches	Alexandria - Luss	Loch Lomond Shores	8	<1
		Luss - Alexandria	Loch Lomond Shores	16	<1
306*	Garelochhead Coaches	Alexandria - Helensburgh	Balloch Bus Terminus	9	<1
		Helensburgh - Alexandria	Balloch Bus Terminus	17	<1
309*	Garelochhead Coaches	Alexandria - Balmaha	Balloch Bus Terminus	21	<1
		Balmaha - Alexandria	Balloch Bus Terminus	13	<1

12.4.25 * From Sunday 17 July 2022., McColls Travel Ltd will operate these services on behalf of Strathclyde Passenger Transport.

Vehicular Access

12.4.26 This section outlines the strategic and local vehicular access routes to the site. They include:

A82 Trunk Road

12.4.27 The A82 runs north – south and is one of two trunk roads through the National Park which is managed by Transport Scotland and therefore is one of the main access routes to the site. It provides access from the centre of Glasgow to Inverness via Fort William. For the most part, this route has a 60mph speed limit. In addition, there are proposals in place to upgrade the section between Tarbet and Inverarnan which aims to reduce congestion and improve traffic flows. The National Park states that travel from central Glasgow would take approximately 40 minutes using the A82.

A811 Stirling Road

12.4.28 In addition to the A82, this trunk road provides key access through the National Park. It links Stirling in the east to the A82 in the west at Balloch, via Drymen. As a result, it provides a connection north to Perth, Dundee and Aberdeen. Generally, the speed limit is 60mph. The National Park notes that car journeys from Stirling are approximately 50 minutes using this route.

B857 (Renton Road / Bank Street / North Main Street / Luss Road)

12.4.29 The B857 connects the A82 in the south to the A811 Stirling Road in the north, running through Renton, Alexandria and Balloch parallel to the A82 and A813. As a result of its built-up surroundings, the B857 has a speed limit of 30 mph with 20mph speed limits in place adjacent to main school routes.

Carrochan Road (A813)

12.4.30 The A813 links the A82, north of Dumbarton at Bellsmyre, to Drymen Road in Balloch crossing the A811. It runs north – south on the east side of the River Leven, parallel to the A82 and B857. The speed limit on this route is predominantly 40mph speed limit, with sections of 30mph in built-up areas.

Balloch Road / Drymen Road

12.4.31 This road runs east – west, parallel to the A811 Stirling Road, through Balloch from A811 Stirling Road in the east to the roundabout with Old Luss Road / Ben Lomond Way in the west, crossing River Leven. It has a speed limit of 30mph.

Ben Lomond Way

12.4.32 This route provides access to the Loch Lomond Shores site from the northern arm of the roundabout with Old Luss Road / Ben Lomond Way and has a speed limit of 30mph. It runs north west from the roundabout to an internal roundabout at Loch Lomond Shores which provides access to the main car parks, before running north east towards Balloch Pier.

Pier Road

12.4.33 This is a private adopted road which runs northwards from Balloch Road to Ben Lomond Way. Signage at the Balloch Road junction states that, due to its private status, “Vehicles using this road do so at their own risk”.

Existing Traffic Flows

12.4.34 **Table** 12-5 below provides a summary of the observed 2017 and estimated 2030 Base Flows for the local and strategic road network. A National Road Traffic Forecast (NRTF) factor has been applied to the 2017 Base Flow to estimate the 2030 Base Traffic Flows.

Table 12-5: 2017/ 2030 AADT Base Flows

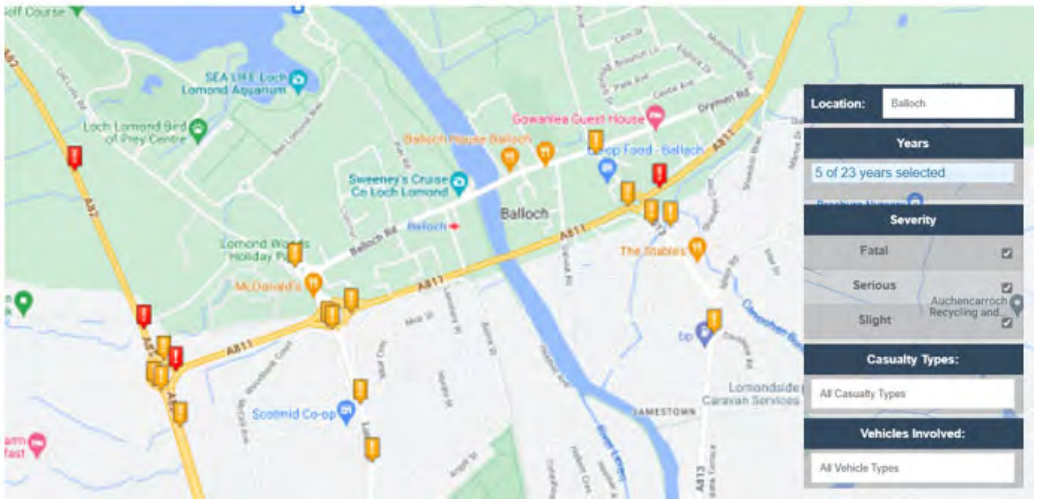
Location	Two-Way Flows (All Vehicles)		HGV's	
	2017	2030	2017	2030
A811 (East of Stoneymollan Roundabout)	16,542	18,808	9%	9%
Old Luss Road (South)	9,375	10,660	7%	7%
Ben Lomond Way	2,661	3,025	10%	10%
Balloch Road (South)	4,958	5,637	8%	8%
Pier Road	292	332	10%	10%
Balloch Road (Balloch Bridge)	4,070	4,628	23%	23%
Stirling Road (A811)	6,009	6,833	19%	19%
A813 Carrochan Road (South)	8,079	9,186	7%	7%
A811 (Lomond Bridge)	12,777	14,527	9%	9%
Luss Road	12,427	14,130	9%	9%
A82 (North of Stoneymollan Roundabout)	20,090	22,842	12%	12%
Old Luss Road (North)	242	275	13%	13%

12.4.35 The development site and its proposed access routes are integral to the existing commercial, retail and leisure development at Loch Lomond Shores, as well as access to the Loch Lomond (Pierhead) slipway and Maid of the Loch.

Existing Accident Data

12.4.36 Crashmap data was interrogated to provide a 5-year summary of the accident history on the local and strategic road network, within the scope of the proposed development site. The 5-year period is from 2017 to 2021, which covers the most recent data available.

Figure 12-1: Crashmap Data



12.4.37 **Figure 12-1** above, indicates that the five year accident data demonstrates a spread of slight and serious accidents on the local road network, which can be disaggregated to the following receptors as:

- Old Luss Road (South) – no reported incidents;
- Ben Lomond Way – no reported incidents;

- Balloch Road (South) – no reported incidents;
- Pier Road – no reported incidents;
- Balloch Road (Balloch Bridge) – no reported incidents;
- Stirling Road (A811) – one serious incident on approach to the Lomond Road Roundabout;
- A813 Carrochan Road (South) – no reported incidents on A813 Carrochan Road, but one slight incident within close proximity to existing residential access points and the A813 Carrochan Road/ A811 Stirling Road;
- A811 (Lomond Bridge) - two slight accidents are dispersed over this link, which suggest driver behaviour/ error as opposed to locational characteristics and constraints are an issue;
- Luss Road - two slight incidents reported along this section;
- A82 (North of Stoneymollan) – two serious incidents reported on the approach from the north to the Stoneymollan Roundabout, albeit more remotely. This section of route is notorious for queuing and delay as a result of exceptionally heavy traffic volumes, which may have contributed to the incidents and propensity for occurrence in this location; and,
- Old Luss Road (North) – one slight injury on approach to Ben Lomond Way roundabout.

12.4.38 Notwithstanding the noted incidents for the links above, the A82 Stoneymollan Roundabout – all approaches and circulatory, and Lomond Road Roundabout (A811/ Old Luss Road (South)) particularly on the A811 and Old Luss Road (South) approaches/ exits, all have a higher incidence of slight accidents. These are likely attributed to higher circulatory speeds, driver error and the higher volume of traffic on these links and junctions generally. The area is also expected to experience a higher prevalence of visitors to the area, who are less familiar with the network and routing/ destination points which may be a contributory factor.

Water-Based Transport

12.4.39 The Waterbus service operates on Loch Lomond and Loch Katrine, offering seven services which are used by cyclists and walkers. The Park offers this as a sustainable alternative to the car which can enhance the visitor experience. There is potential to develop upon the success of the Waterbus with the opportunity to enhance integration as part of a wider tourism and/ or access strategy.

12.4.40 Loch Lomond services offer alternative connections between Balloch, Luss, Balmaha and Tarbet amongst others. Generally, these run between April and October, although seasonality varies between services.

Summary of Receptor Sensitivity

12.4.41 The sensitivity of receptors has been defined as follows:

- Low – receptors which are lightly used (by all users or particularly by vulnerable road users) relative to other receptors within the study area;
- Medium – receptors which are used (by all users or particularly by vulnerable road users) to a roughly average level relative to other receptors within the study area; and,
- High – receptors which are heavily used (by all users or particularly by vulnerable road users) relative to other receptors within the study area.

12.4.42 Significance criteria are determined through referencing magnitude of change with sensitivity of receptors. The significance of traffic change varies depending upon the environmental impact criteria being considered.

12.4.43 The receptors considered in this assessment include those people making journeys within the relevant study area (or links) for each mode, and include those travelling by that mode, or travelling by other modes affected by the mode in question, on the following links:

- Old Luss Road (South) – medium sensitivity for all users;
- Ben Lomond Way – low sensitivity for all users;
- Balloch Road (South) – low sensitivity for all users;
- Pier Road – low sensitivity for all users;

- Balloch Road (Balloch Bridge) – low sensitivity for all users;
- Stirling Road (A811) – low sensitivity for all users;
- A813 Carrochan Road (South) – low sensitivity for all users;
- A811 (Lomond Bridge) – low sensitivity for all users;
- Luss Road – medium sensitivity for all users;
- A82 (North of Stoneymollan) – low sensitivity for all users; and,
- Old Luss Road (North) – low sensitivity for all users.

Baseline Evolution

12.4.44 Baseline traffic, transport and access conditions at the development site are expected to remain as per the existing situation, without the development proposals. The development site is integral to a wider existing commercial, retail and leisure development, which is anticipated to operate as per the status quo, without development intervention.

12.5 Embedded Mitigation

12.5.1 As detailed in **Chapter 2 – Site and Proposed Development**, a number of design features and embedded mitigation measures have been incorporated into the design and construction of the proposed development to avoid, prevent or minimise significant adverse environmental effects and to enhance beneficial effects. Embedded mitigation measures of relevance to this assessment are:

Construction Phase

12.5.2 The embedded mitigation measures incorporated within the proposed development are as follows:

Construction Environmental Management Plan (CEMP):

- Development and implementation of measures relating to: construction traffic routing, site access/deliveries, parking, contractor management, parking, fuels and materials storage, standard dust and noise suppression techniques and standard pollution presentation and control techniques. These measures will be set out within a Construction Environmental Management Plan (CEMP). Any other measures to be included in the CEMP would be identified as 'further mitigation' (not embedded) through the EIA;
- Any construction activities within a 5m strip along waterfronts will be subject to specific consideration within a CEMP to be agreed with the NPA prior to commencement; and,
- Adoption of standard construction industry working hours for noise generating activities.

Operational Phase

12.5.3 The embedded mitigation measures incorporated within the proposed development are as follows:

Design & Form-Based Mitigation

- It is intended that the proposed development will be fully accessible by sustainable modes of transport. The existing pedestrian and cycle network as it exists through the West Riverside site will be retained and enhanced as necessary to provide full connectivity to the wider network as well as all new internal elements of the site. The site will benefit from increased uptake of sustainable modes over the use of the private car, and it is anticipated that walking and cycling will be the go-to-mode of choice for those visitors using the woodland lodges and overnight accommodation: by leaving their cars remote from the lodges, it is hoped this will reduce any unnecessary internal car trips;
- Bike hire is proposed as part of the Station Square and enhanced Tourist Information Office offering, which will further support internal movements by bike;
- Whilst the internal layout requires to be developed further as part of subsequent detailed design stages, it is intended that the existing cycle and walking routes will be widened to

SUSTRANS standards for shared walking and cycling routes, where this is practicable to do so;

- Throughout the Station Square, Riverfront and Drumkinnon areas, the existing path network including the John Muir Way will be retained and enhanced as appropriate, albeit some relocating of certain sections may be required. It is expected that discussions will be held with SUSTRANS when the detail of these routes is considered. The existing north-south foot and cycle paths through the Riverfront Zone, will be enhanced with a series of east-west paths increasing access opportunities between Pier Road and the Riverfront area;
- The existing foot and cycle way from Loch Lomond Shores to Old Luss Road will be extended to provide a shared foot and cycle way, compliant with technical standards, on the north (development) side of the road, providing a direct walking and cycling link between the two sites;
- From the Woodbank House site, which is intended to be configured in accordance with Designing Streets Principles and will provide a continuous internal path network, a direct foot and cycle link will be provided to the Upper Stoneymollan Road/ John Muir Way; and,
- A signage and wayfinding strategy will be developed for the wider site, once clarification on the preferred parking locations for site-based activities and land uses are confirmed. It is expected that a combination of enhanced signage and Variable Message Signing (VMS) will need to be installed at key approaches to the site from both the strategic and local road network, as well as internally within the site, to ensure effective vehicular movement for internal destinations and appropriate directions to the relevant car parking areas.

12.6 Potential Likely Effects

12.6.1 This section describes the potential effects associated with the development proposals in relation to construction and operational traffic.

Construction Phase

12.6.2 The transport, traffic and access impacts arising as a result of the proposed development are considered to be negligible as a result of incorporating the CEMP embedded mitigation. Moreover, the development will be built-out in discrete phases such that individual sections of the site will be subject to the effects of construction traffic at any one time. The scale of the effect of the development is minor negligible.

Operational Phase

12.6.3 **Table 12-6** below includes a summary of the potential number of vehicular trips associated with the completed development proposals during a based on the trip rates described in detail in the Transport Assessment.

12.6.4 The flows represent the number of external trips generated by the site and do not include any reductions for internal trips i.e. trips shared between different land uses and working and living within the site.

Table 12-6: Estimated Number of Two-Way External Development Daily Trips

Development	Two-Way Daily Vehicular Flows	
	Weekday	Weekend
West Riverside & Woodbank House	1,433	1,958

12.6.5 **Table** 12-7 below provides a summary of the potential changes in traffic on the local road network once the proposed development is fully operational.

Table 12-7: 2030 AADT With Development Flows

Location	Two-Way Flows (All Vehicles)	HGVs	% Change Over 2030 Base
A811 (East of Stoneymollan Roundabout)	19,841	9.4%	5%

Location	Two-Way Flows (All Vehicles)	HGVs	% Change Over 2030 Base
Old Luss Road (South)	12,060	5.6%	13%
Ben Lomond Way	4,038	7.7%	33%
Balloch Road (South)	6,239	7.2%	11%
Pier Road	427	8.3%	29%
Balloch Road (Balloch Bridge)	5,268	21.3%	14%
Stirling Road (A811)	7,002	17.4%	2%
A813 Carrochan Road (South)	9,341	7.2%	2%
A811 (Lomond Bridge)	14,640	9.5%	1%
Luss Road	14,353	8.6%	2%
A82 (North of Stoneymollan Roundabout)	23,336	11.6%	2%
Old Luss Road (North)	506	13.5%	84%

12.6.6 Noting the % change in traffic from the baseline 2030 to the baseline with development flows and in accordance with the IEA guidelines, the following links will not be subject to further assessment:

- A811 (East of Stoneymollan Roundabout;
- Stirling Road (A811);
- A813 Carrochan Road (South);
- A811 (Lomond Bridge);
- Luss Road; and,
- A82 (North of Stoneymollan Roundabout).

12.6.7 The impacts on the roads listed above are less than 10% and, as such, traffic flow impacts are considered negligible. The scale of the effect of the development on the above links is minor negligible.

12.6.8 Old Luss Road (South) will experience an uplift in AADT flows by 13% as a result of the development traffic, but this remains less than the IEA guidelines requirement of a 30% increase in traffic warranting further assessment. As such, this route will not be considered further. The scale of the effect of the development is minor adverse.

12.6.9 Noting the % change in traffic from the baseline 2030 to the baseline with development flows and in accordance with the IEA guidelines, the following links will be subject to further assessment:

- Ben Lomond Way; and,
- Old Luss Road (North).

Effect on Pedestrians and Cyclists

12.6.10 Ben Lomond Way and Old Luss Road (North) constitute the two main access routes into the site with an increase of traffic over 30%.

12.6.11 Old Luss Road (North) experiences an 84% uplift in traffic flow as a result of the development, but the existing nature of the road as a quiet, predominantly residential/ rural no-through-route, is such that the increase in flows are noted as a moderate adverse effect. The % impact is considered moderate, despite the modest levels of development that will be accessed from Old Luss Road. At present, whilst the section of Old Luss Road (north beyond the existing Loch Lomond Shores pedestrian access) is used for walking to Cameron House, Duck Bay and beyond, the area fronting the development site is not particularly conducive to walking and cycling as a result of poor lighting and lack of appropriate footways on either side of the carriageway. The development includes for provision of enhanced lighting, a connection will be provided between Loch Lomond Shores to Old Luss Road to provide a shared foot and cycle way, compliant with technical standards, on the north (development) side of the road, providing

a direct walking and cycling link between the two sites and onwards to Balloch. Further, a connection will be provided within the Woodbank House site to the Upper Stoneymollan Road/ John Muir Way, thereby enhancing the environment overall for pedestrians and cyclists. Increased ambient surveillance in the area as a result of additional residential properties, lends itself to improving actual and perceived personal security for walkers and cyclists. The scale of the effect of the development is moderate beneficial.

12.6.12 Ben Lomond Way is the existing main access to the existing Loch Lomond Shores and provides the most appropriate direct access route into the proposed development site, both in terms of its proximity and ready access to the wider local and strategic road network, as well as its current form with a remote pedestrian and cycle path to the east. Ben Lomond Way experiences an 33% uplift in traffic flow as a result of the development proposals which will see the AADT traffic flow rise from 3,025 to 4,038 on the road in 2030. This is considered to pose a major adverse effect in terms of traffic flow, albeit this is a preferential position to potentially higher vehicle flows on Balloch Road (South) which has frontage residential properties and is a gateway route into Balloch main village from the west.

12.6.13 The existing pedestrian environment immediately adjacent to Ben Lomond Way is considered to be of a reasonable standard and, in terms of pedestrian amenity, the existing foot and cycle way is remote from the carriageway with a tree-lined avenue-type environment. As such, other road users are largely removed from the immediate road network and the environment is likely to remain relatively pleasant for walkers and cyclists. In addition, there are a number of pedestrian crossing routes approaching Ben Lomond Way, for which a number of access options or routing variations is possible. Given the limited need to cross Ben Lomond Way, largely as a function of no attractors on the west side of the carriageway, the existing pedestrian environment is expected to prevail with limited effects on severance, fear and intimidation and pedestrian amenity. A crossing point exists on the southern end of Ben Lomond Way and the Queen of the Loch pub/ restaurant, for which it is expected some severance and fear and intimidation impacts could be felt. Vehicle speeds are generally low in this area and will remain the case, if not lessened, by increased traffic volumes. It is suggested that pedestrian movements will require to be monitored incrementally as the development builds out in phases, to ascertain the trigger point for enhanced pedestrian crossing infrastructure. The scale of the effect of the development is minor adverse.

Effect on Road Users

12.6.14 Delay to drivers can be predicted through capacity assessments at key points on the local road network. The TA (**Appendix E**) includes detailed junction capacity assessment results for the access routes and network junctions within the scope of the TA and influence of the proposed development site. The detailed junction capacity assessments suggest that remedial junction measures are not required on the local or strategic road network as a result of the development proposals.

12.6.15 As discrete phases of development come forward for detailed development in conjunction with refinement of the parking management, access and routing strategy, then monitoring should be implemented to gauge the quantum of “actual” development traffic levels (over the assessments ‘theoretical’ basis) on key routes. This will allow any locational and route-specific interventions and mitigation to be more accurately tailored. The scale of the effect of the development is minor negligible.

12.7 Further Mitigation and Enhancement

Construction Phase

12.7.1 The further mitigation and enhancement measures incorporated within the proposed development are as follows:

Construction Environmental Management Plan (CEMP):

- Development and implementation of measures relating to: construction traffic routing, site access/deliveries, parking, contractor management, parking, fuels and materials storage, standard dust and noise suppression techniques and standard pollution presentation and control techniques. These measures will be set out within a Construction Environmental

Management Plan (CEMP). Any other measures to be included in the CEMP would be identified as 'further mitigation' (not embedded) through the EIA;

- Any construction activities within a 5m strip along waterfronts will be subject to specific consideration within a CEMP to be agreed with the NPA prior to commencement; and,
- Adoption of standard construction industry working hours for noise generating activities.

Operational Phase

12.7.2 The mitigation measures incorporated within the proposed development are as follows:

An Outline Travel Plan

- Contained within the Transport Assessment an Outline Travel Plan incorporates actions and incentives and an ongoing programme of delivering sustainable travel options for the proposed development site. This includes several potential measures which could be implemented to support sustainable travel choices for future employees, through both induction processes and provision of a travel information pack for new starts. This would also include the provision of a Residential Travel Information Pack for the residential component of the site, which will be issued at point of occupation.

Monorail

- A monorail is incorporated into the development proposals to provide better connectivity between Zone A (Station Square) and Zone C (Pierhead). This will provide better connectivity between Balloch Village and Loch Lomond Shores, through provision of a safe, direct and convenient means of transport. During the winter months/ dark nights the existing Pier Road and walking routes adjacent to the River Leven (Riverfront area) are not conducive to walking as function of reduced personal security, and the overall distance. As such, the monorail will help support an evening economy at the existing and with-development scenarios.

Public Transport

- The proposed WDC plans for the Station Square enhancements on Balloch Road between the proposed new Station Square development (Zone A) and Balloch Railway Station, will help deliver enhanced access between the station and the proposed development site as well as the wider village of Balloch. It is also understood that revised parking arrangements are being considered for Balloch Rail Station as part of the wider “Balloch Village Parking Proposals” which are hoped to alleviate parking issues in the locality as well as encourage an uptake in rail usage;
- Discussions have been undertaken with ScotRail Abellio to seek to agree in principle the mutual benefits of promoting access to the development site by rail. Whilst any interventions are still in early developmental stages, these are presently anticipated to include:
- Shared-ticketing: whereby rail and attraction-tickets can be purchased simultaneously, incorporating some form of discount for the passenger/ visitor;
- The opportunity to promote the new West Riverside development as a destination, where branding/ wrapping the trains can be used as a marketing/ promotional incentive; and,
- The potential for further studies into the need for enhanced rail services either by frequency and/ or selective station stopping to improve journey times.

Remote Lodge Accommodation Parking

- For accommodation land uses, except for the Woodbank House site, the arrivals and parking for this element can be managed from the point of booking, whereby visitors can be advised of the intended arrival and check-in arrangements. The intention is that accommodation-based-visitors and associated parking will be segregated from other land-uses and that parking will be provided remotely from the accommodation. Small buggies will be used to transport visitors and baggage to their holiday accommodation. This will reduce both unnecessary vehicular circulation at arrival and departure times but is also expected to reduce the use of cars for short-trips by guests throughout their stay: it will be more convenient to walk, cycle or use the mono-rail for shorter local and site-internal trips.

12.8 Residual Effects

12.8.1 The residual effects arising from the development proposals following the implementation of the mitigation measures are described below.

Construction Effects

12.8.2 Appointed contractors would be required to implement strategies and work plans to minimise the potential effects of construction works on pedestrians, cyclists and drivers. Notwithstanding this, there would be **negligible to short-term slight adverse residual effects (not significant)** on pedestrians and drivers in terms of severance, amenity and delay due to construction activity.

Operational Effects

12.8.3 The embedded design and operational mitigation measures proposed would ensure that the potential traffic impact associated with the development proposals can be satisfactorily accommodated. Junction capacity assessments suggest that there would some slight delay and congestion on some junctions within proximity to the site, due to development traffic, albeit not so much as to warrant remedial action to the junctions to increase capacity. The ongoing management of the eventual operational Travel Plan for the site, as well as the careful monitoring of usage of walking, cycling and vehicular access routes, will help ensure that any ongoing interventions for access and parking management are evaluated. Where measures are gauged to be less effective, then ongoing targets for improvement will help ensure appropriate initiatives and interventions are undertaken. The scale of the effect of the development is concluded to be **moderate beneficial (significant).**

12.8.4 The increases in the AADT traffic flow as a result of the development proposals are initially considered to be moderate adverse at Balloch Road (South) and Old Luss Road (North), albeit the operational mitigation, in conjunction with WDC streetscape improvements schemes (Balloch Road) will assist in an enhanced walking and cycling environment generally and are therefore considered beneficial within the wider context of the development proposals. The scale of the effect of the development is concluded to be **moderate beneficial (significant).**

12.8.5 The increases in the AADT traffic flow as a result of the development proposals are initially perceived to be substantial adverse at both Pier Road and Ben Lomond Way, the two main access points into the main West Riverside site. Given the existing status of Pier Road as private, the uplift in traffic flows are initially perceived as being substantial, however, in the wider context of improvements to the existing function of Pier Road and the wider “movement” environment, the development proposals are considered to deliver a moderate benefit to the locality overall. The traffic impacts at Ben Lomond Way in terms of pedestrians and cyclist’s amenity are focused in an area of less sensitivity (limited residential area) as opposed to wider dispersal of more significant impacts on more sensitive residential and village centre areas. Further, monitoring of pedestrian and cycle movements on the key access routes will help identify trigger points for mitigation and/ or intervention as detailed stages of the development are progressed. The scale of effect of the development is concluded to be **moderate beneficial (significant)** at Pier Road, and **minor beneficial (not significant)** at Ben Lomond Way.

12.9 Monitoring of Residual Effects

12.9.1 Ongoing monitoring of traffic flows and walking and cycling on the key access routes into the development should be undertaken during build-out and completion stages to ascertain the appropriate trigger level for additional interventions. These are likely to include provision of designated pedestrian and cycle crossings, albeit their requirement and preferred location, would be based on actual operational data as opposed to the current theoretical data. It is expected that internal parking and routing operations will evolve as the application progresses to the detailed stage, and as such it would currently be abortive to include additional and, potentially surplus, infrastructure at the present time.

12.10 Summary

12.10.1 As a result of the proposed development and design measures, the effects of the development on the surrounding local and strategic road network, are not anticipated to result in substantial adverse effects. The embedded and operational mitigation is anticipated to greatly expand and

enhance the walking, cycling and public transport environment within the immediate site and within the wider Balloch village. This is anticipated to materially change the local "road focussed culture in the area, in conjunction with the WDC Balloch Village, Station Square and Road/ streetscape proposals, which will see an uptake in the use of sustainable modes of travel within the local area more generally.

12.10.2 All construction traffic to and from the site will be controlled by a routing agreement which will ensure the correct road hierarchy is used and will prevent the use of residential roads by such vehicles, therefore resulting in a temporary slight adverse impact on road users, pedestrians and cyclists during this phase.

12.10.3 There would be increases in traffic flows within the Loch Lomond Shores/ development site as a result of the development proposals, more noticeably on roads Old Luss Road (North) and Ben Lomond Way, which constitute the main access roads and links into the site. The % increase in AADT flows as a result of development require to be put in context to the existing status quo, which lessens the overall impact to moderate on Old Luss Road (North). Ben Lomond Way requires to be subject to monitoring during the construction and operational phases, to determine any future requirement for associated intervention or mitigation to reduce pedestrian and cyclist delay and fear and intimidation. Increases elsewhere will be less noticeable and generally confined to peak periods.

12.10.4 Junction capacity impact assessments undertaken in the TA indicate that remediation and mitigation are not required to improve the capacity at local or strategic road junctions. Moreover, increasing capacity is understood to lead to an eventual increase in vehicles, which should be avoided wherever practicable.

12.10.5 The provision of the improved public transport, pedestrian and cycle routes through the site and to the surrounding areas of Balloch will, in conjunction with site-specific initiatives as well as the implementation of a Travel Plan and other ongoing Parking and Access Management strategies, potentially lead to an overall increase in the uptake and propensity of use for sustainable modes to the moderate benefit of all road users.

12.11 References

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13 Archaeology and Cultural Heritage

13.1 Introduction

13.1.1 This chapter provides an assessment of the likely significant effects of the Proposed Development on the historic environment (archaeology and cultural heritage). The assessment is based on the known characteristics of the Site and surrounding area and the key parameters of the Proposed Development detailed in **Chapter 2 – Site and Proposed Development**.

13.1.2 This chapter has been prepared by Headland Archaeology in line with best practice. A statement outlining the relevant expertise and qualifications of competent experts appointed to prepare this chapter is provided in **Appendix 13.1**.

13.1.3 The aims of this chapter are to:

- Describe the location, nature and extent of any known heritage assets or areas of archaeological potential which may be affected by the Proposed Development;
- Provide an assessment of the importance of these assets;
- Assess the likely scale of any impacts on the historic environment posed by the Proposed Development;
- Outline suitable mitigation measures to avoid, reduce or offset significant adverse effects; and,
- Provide an assessment of any residual effects remaining after mitigation.

13.1.4 This chapter is supported by the following figures and technical reports provided in **Appendices 11.1, 11.5, 13.1 and 13.2**:

- **Appendix 11.1 – Figures** includes figures showing the Zones of Theoretical Visibility (ZTV) relevant to this assessment:
  - **Figure 11-3a** – Pierhead Development ZTV;
  - **Figure 11-3b** – Station Square Development ZTV;
  - **Figure 11-3c** – Woodbank Development ZTV;
  - **Figure 11-3d** – Boathouse ZTV; and,
  - **Figure 11-3e** – Riverfront Development ZTV.
- **Appendix 11.5 – Visualisations** includes viewpoints relevant to this assessment:
  - Viewpoint 02 – Loch Lomond Shores;
  - Viewpoint 03 – Maid of the Loch slipway;
  - Viewpoint 04 – Woodbank House;
  - Viewpoint 05 – Cameron House Lodge, Old Luss Road (view south-west);
  - Viewpoint 06 – Old Luss Road (view west);
  - Viewpoint 08 – John Muir Way (east bank of River Leven) (view north-west);
  - Viewpoint 10 – Balloch Road (bridge over river); and,
  - Viewpoint 25 – Boat cruises (inbound route).
- **Appendix 13.1 - Baseline** includes:
  - Cultural Heritage Baseline Desk-based Assessment.
- **Appendix 13.2 - Figures** includes:
  - **Figure 13-1** Heritage Assets Within the Site;
  - **Figure 13-2** Non-designated Heritage Assets Within the Study Area;
  - **Figure 13-3** Designated Heritage Assets Within the Study Area; and,

- **Figure 13-4** 1st Edition Ordnance Survey Map, Six Inch to the Mile,1864.

13.2 Policy Context, Legislation, Guidance and Standards

Legislation

13.2.1 The overarching legislative framework applicable to this EIA-R for the Proposed Development is outlined in **Chapter 4 – Legislative and Planning Policy Context**. Over and above this the following legislation is relevant to this assessment:

Statutory Protection

13.2.2 Scheduled Monuments and Listed Buildings are protected by statute.

13.2.3 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) (Scotland) Act 1997.

13.2.4 The 1979 Act makes no reference to the settings of Scheduled Monuments. The 1997 Act does, however, place a duty on the planning authority with respect to Listed Buildings and Conservation Areas, and their settings. Section 59 of the 1997 Act states (in part):

"In considering whether to grant planning permission for development which affects a listed building or its setting, a planning authority or the Secretary of State, as the case may be, shall have special regard to the desirability of preserving the building or its setting or any features of special architectural or historic interest which it possesses."

13.2.5 The Historic Environment Scotland Act 2014 defines the role of the public body, Historic Environment Scotland (HES), and the processes for the designation of heritage assets, consents and rights of appeal.

Policy

13.2.6 The planning policy framework applicable to this EIA-R for the Proposed Development is outlined in **Chapter 4 – Legislative and Planning Policy Context**. In addition to this, the following planning policies are relevant to this assessment:

13.2.7 The National Planning Framework 3 (NPF3) describes how the future spatial development of Scotland can contribute to the four planning outcomes noted above. It shows where there will be opportunities for growth and regeneration, investment in the low carbon economy, environmental enhancement, and improved connections across the country.

13.2.8 Historic Environment Policy for Scotland (HEPS) defines the Historic Environment and Scottish Government Policy. It sets out the vision and key principles on how to care for and protect Scotland's historic environment including designations of ancient monuments, principles for scheduling and listing, contexts for conservation areas, marine protected areas, gardens and designated landscapes, historic battlefields and consents and advice.

13.2.9 The Scottish Government's planning policies in relation to the historic environment are set out in paragraphs 135-151 of Scottish Planning Policy (SPP) (The Scottish Government, June 2014). The historic environment is defined as "the physical evidence for human activity that connects people with place, linked with the associations we can see, feel and understand" and includes "individual assets, related settings and the wider cultural landscape".

13.2.10 The policy principles are stated in paragraph 137:

"The planning system should:

- promote the care and protection of the designated and non-designated historic environment (including individual assets, related settings and the wider cultural landscape) and its contribution to sense of place, cultural identity, social well-being, economic growth, civic participation and lifelong learning; and,
- enable positive change in the historic environment which is informed by a clear understanding of the importance of the heritage assets affected and ensure their future use. Change should be sensitively managed to avoid or minimise adverse impacts on the fabric and setting of the asset, and ensure that its special characteristics are protected, conserved or enhanced."

13.2.11 The SPP applies these principles to all designated assets (paragraphs 141-149). In particular, it states that:

- Regarding developments affecting Listed Buildings, “special regard must be given to the importance of preserving and enhancing the building, its setting and any features of special architectural or historic interest”;
- Proposals “which will impact on its appearance, character or setting [of a Conservation Area], should preserve or enhance the character and appearance of the conservation area”;
- “Where there is potential for a proposed development to have an adverse impact on a scheduled monument or on the integrity of its setting, permission should only be granted where there are exceptional circumstances”;
- “Where a development proposal has the potential to affect a World Heritage Site, or its setting, the planning authority must protect and preserve its Outstanding Universal Value”;
- “Planning authorities should protect and, where appropriate, seek to enhance gardens and designed landscapes included in the Inventory of Gardens and Designed Landscapes and designed landscapes of regional and local importance”; and,
- “Planning authorities should seek to protect, conserve and, where appropriate, enhance the key landscape characteristics and special qualities of sites in the Inventory of Historic Battlefields”.

13.2.12 The SPP also requires planning authorities to protect archaeological sites and monuments, preserving them in situ where possible, or otherwise ensure “appropriate excavation, recording, analysis, publication and archiving before and/or during development” (paragraph 150). “Non-designated historic assets and areas of historical interest, including historic landscapes, other gardens and designed landscapes, woodlands and routes such as drove roads” should also be preserved in situ wherever feasible (paragraph 151).

13.2.13 ‘Our Place in Time: the Historic Environment Strategy for Scotland’ (2015) presents the Scottish Government’s strategy for the protection and promotion of the historic environment. The Historic Environment Policy for Scotland (HEPS, 2019) and the Historic Environment Scotland Circular (2019) complement the SPP and provide further policy direction. In particular, HEPS provides more detailed policy on historic environment designations and consents.

13.2.14 The statutory Development Plan applicable to the Site and relevant to this chapter presently comprises Section 4.2 of the Loch Lomond and the Trossachs National Park Local Development Plan.

13.2.15 Planning policy considerations of specific relevance to this assessment are:

Historic Environment Policy 1: Listed Buildings

a) Alterations and Extensions

Development which alters or extends a listed building will only be supported where it can be demonstrated that: (i) Proposals will protect, conserve and/or enhance the character, integrity and setting of listed buildings, and (ii) The layout, design, materials, scale, siting and use shall be appropriate to the character and appearance of the listed building and its setting whilst not inhibiting high quality contemporary and/or innovative design.

b) Demolition

Proposals for the total or substantial demolition of a listed building will only be supported where it has been demonstrated that: (i) The building is not of special interest; or (ii) The building is incapable of repair; and reuse through the submission and verification of a thorough structural condition report produced by a qualified structural engineer; or (iii) The demolition of the building is essential to delivering significant benefits to economic growth or the wider community; or (iv) The repair of the building is not economically viable and that it has been marketed at a price reflecting its location and condition to potential restoring purchasers for a reasonable period.

c) *Enabling Development*

Where a listed building is seriously at risk from neglect or from an inability to secure an appropriate new use, enabling development may be supported. In considering such development it must be demonstrated that: (i) Financial assistance is not available from any other source; and (ii) Development will be restricted to the minimum required to secure the long-term future of the listed building; and (iii) Development conserves and/or enhances the special interest, character and setting of the listed building through appropriate layout, scale, massing, design, and use of materials.

Historic Environment Policy 3: Wider Built Environment and Cultural Heritage

Development proposals will be expected to protect, conserve and/or enhance a building or feature of architectural and/or historical merit or of cultural significance. Buildings or features of merit which are important to the cultural heritage of the National Park should be retained and incorporated in new developments where possible and any adverse impacts of the development should be avoided or mitigated.

Historic Environment Policy 4: Gardens and Designed Landscapes

Development affecting Gardens and Designed Landscapes shall protect and/or enhance such places and shall not impact adversely on their character, important views to, from or within them or their wider landscape setting. Significant development proposals in gardens and designed landscapes will require management plans as a condition of any planning permission.

Historic Environment Policy 5: Conversion and Re-Use of Redundant Buildings

Proposals for sympathetic conversion and re-use of buildings of vernacular quality and local historic and/or architectural interest will be supported where:

a) *The building is structurally sound; and,*

b) *Capable of conversion without significant rebuilding or new building elements.*

Historic Environment Policy 6: Scheduled Monuments and Other Nationally Important Archaeological Sites

Scheduled monuments and other identified historic environment assets which satisfy the criteria for national importance set out by Scottish Ministers shall be preserved in-situ within an appropriate setting. Development shall not be permitted which adversely affects scheduled monuments and their setting.

Historic Environment Policy 7: Other Archaeological Resources

Other archaeological resources will be expected to be retained, protected and preserved in-situ and in an appropriate setting wherever feasible. Where it can be demonstrated that preservation in-situ is not feasible, planning approval will be conditional upon the developer making appropriate provision for the archaeological excavation, recording, and analysis of the resources, and for publication of the results where appropriate, all to the satisfaction of the National Park Authority.

Historic Environment Policy 8: Sites with Unknown Archaeological Potential

Where sites are considered to have significant archaeological potential the developer will be required to submit details of the results of an archaeological evaluation of the site with the application, or before its determination. Where significant archaeological remains are found during evaluation, and where they cannot be preserved in-situ, planning permission may be refused or made conditional on compliance with an agreed programme of archaeological mitigation as required by the National Park Authority.

Guidance and Relevant Technical Standards

13.2.16 The following guidance and technical standards have informed this assessment:

- Planning Advice Note 2/2011: Planning and Archaeology provides local government officers with technical advice to planning authorities and developers on dealing with archaeological remains. Among other issues it considers the balance in planning decisions between the preservation in situ of archaeological remains and the benefits of development; setting; the circumstances under which developers can be required to provide further information, in the form of a field evaluation to allow planning authorities to reach a decision; and measures that can be taken to mitigate adverse impacts;
- PAN 71 Conservation Area Management provides local government and stakeholders with planning advice with regard to conservation areas;
- HES published Designation Policy and Selection Guidance (DPSG, 2019) to accompany HEPS. DPSG outlines the policy and selection guidance used by HES when designating sites and places of national importance;
- HES provides guidance on how to apply the policies set out in the SPP in a series of documents entitled 'Managing Change in the Historic Environment'. These provide guidance to planning authorities and stakeholders regarding key issues relating to development, the planning process, and key issues pertaining to the historic environment. Most relevant is the guidance note covering Works on Scheduled Monuments (November 2016) and Setting (June 2016); and,
- HES' New Design in Historic Settings provides a guide to ensuring the quality of new-design buildings matches that of their surroundings (May 2010).

13.2.17 This chapter has been prepared with reference to the above as well as CIfA's Standard and Guidance for Historic Environment Desk-Based Assessment (2014, revised 2017 and 2020) and Code of Conduct (2014, revised 2019).

13.2.18 This chapter has also been prepared with reference to IEMA, IHBC and CIfA's July 2021 publication Principles of Cultural Heritage Impact Assessment in the UK. This document presents the principles of and suggests good practice for assessment of the impact of a development proposal on cultural heritage assets.

13.3 Methodology

Overview

13.3.1 The principal aspects considered within this assessment are:

- The potential for the operational phase of the Proposed Development to result in impacts on the setting of designated heritage assets, on account of likely changes to views from and towards such assets. The key heritage assets considered within this assessment are:
  - Potential setting effects on the Category A Listed Woodbank House with Garden Building (LB1125) and stables (HA4);
  - Potential setting effects on the Category A Listed Drumkinnon Bay Winch House including Slipway (LB46721);
  - Potential setting effects on the Category A Listed Balloch Castle (LB123) and Inventory Garden and Designed Landscape (GDL00042);
  - Potential setting effects on the Scheduled Balloch Castle earthwork (SM3385); and,
  - Direct construction phase impacts on any known and previously unrecorded archaeological remains within the Site.

Consultation

EIA Screening and Scoping

13.3.2 Consultation responses from Historic Environment Scotland (HES) and West of Scotland Archaeology Service (WoSAS) in relation to a previous planning application for the Proposed Development were received in May 2017. HES noted one Category A Listed Building present

within the Site: Woodbank House with Garden Building (LB1125) located within the West Riverside area. The Category A listed Winch House including Slipway (LB46721), Balloch Castle Inventory Garden and Designed Landscape (GDL00042) and the scheduled remains of Balloch Castle earthwork (SM3385) were also noted in the vicinity.

13.3.3 HES welcomed the potential for Woodbank House with Garden Building (LB1125) to be restored as part of the Proposed Development and recommended that the east elevation of the house and its setting be preserved as far as possible, with consideration made in relation to views from the south front of the house towards distant hills. HES requested that any setting assessment should cover the potential impact of the Proposed Development on key views to and from the house to the east and south.

13.3.4 In relation to Balloch Castle (GDL00042) and Balloch Castle earthwork (SM3385), HES recommended that the development should be designed to consider these assets and their setting and explore the potential for incorporation of new views to them from Balloch Pier (WoSAS 21743) pier at the north of the Site. In addition, they recommended that development at the eastern extent of the Site be kept to a minimum and that any setting assessment should assess potential impacts on both the Scheduled Monument and Inventory Designed Landscape.

13.3.5 In relation to Winch House including Slipway (LB46721), HES recommended that the Proposed Development should accommodate the asset and its setting through design and that an assessment of the setting of the building should be carried out to show that important views from it are retained.

13.3.6 WoSAS noted that the Site lies within an area of high archaeological sensitivity based on the presence of recorded sites and finds from various periods in the surrounding landscape, particularly including prehistoric and Medieval sites. They noted the suitability of the Site for past human use and the potential for previously unrecorded buried remains to exist. WoSAS therefore recommended that prior to any development commencing, that the application area be subject to an archaeological evaluation in order to excavate, record and publish any previously unrecorded remains which may exist. In addition, WoSAS advised that an historic building recording exercise would be required for Woodbank House with Garden Building (LB1125) prior to any alterations taking place. WoSAS advised that these works would be carried out through a condition relating to cultural heritage and archaeology; such a condition would be placed on the Proposed Development by Loch Lomond and the Trossachs National Park should they be minded to grant consent. In their original 2017 response, WoSAS advised that any such condition would likely be worded as follows:

'No development shall take place within the development site as outlined in red on the approved plan until the developer has secured the implementation of a programme of archaeological works in accordance with a written scheme of investigation which has been submitted by the applicant, agreed by the West of Scotland Archaeology Service, and approved by the Planning Authority. Thereafter the developer shall ensure that the programme of archaeological works is fully implemented and that all recording and recovery of archaeological resources within the development site is undertaken to the satisfaction of the Planning Authority in agreement with the West of Scotland Archaeology Service.'

13.3.7 It was confirmed through further consultation in 2021 (see below) that any required mitigation could be secured under such a condition as outlined above.

Post Scoping Consultation

13.3.8 Following the withdrawal of the previous planning application in 2019, a revised development (the subject of this chapter) was brought forward, with a revised Scoping Report submitted to HES and WoSAS in June 2021.

13.3.9 In response to the revised Scoping Report, HES reiterated the advice provided in their 2017 response to the Scoping Report for the original development. WoSAS also reiterated their response to the 2017 Scoping Report for the original development but highlighted that data sources should be revisited, and the heritage assets present within the Site be re-visited for assessment.

13.3.10 Recommendations for further archaeological investigations made at the end of this report are in accordance with the advice received from the Senior Archaeologist at WoSAS.

Study Area

13.3.11 The spatial scope of the Study Area adopted in this Archaeology and Cultural Heritage chapter was determined by a review of the scale and nature of the Proposed Development and the nature of the heritage assets in the wider vicinity. A review of the ZTV for the Proposed Development (**Figures 12-3a – 12-3e**, **Appendix 12.1**) was undertaken to inform the scope of the heritage assets retained for detailed setting assessment.

13.3.12 Two areas have been used in assembling and presenting the data for this chapter:

- The Site corresponds to the area within the application boundary in order to include any known or unknown heritage assets at risk of direct and indirect impacts; and,
- The Study Area extends 1km from the Site boundary. Within this area background data has been collated to inform the archaeological potential of the Site, identify any heritage assets which may be affected as they continue into the Site and to identify assets which may be subject to setting effects.

13.3.13 Criteria for the identification of assets of particular sensitivity or importance was based on the approach set out in Managing Change in the Historic Environment: Setting (Historic Environment Scotland, 2016 updated 2020) that sets out a range of factors which might form part of the setting of a heritage asset as follows:

- "Current landscape or townscape context;
- Views to, from and across or beyond the historic asset or place;
- Key vistas: for instance, a 'frame' of trees, buildings or natural features that give the historic asset or place a context, whether intentional or not);
- The prominence of the historic asset or place in views throughout the surrounding area, bearing in mind that sites need not be visually prominent to have a setting;
- Aesthetic qualities;
- Character of the surrounding landscape;
- General and specific views including foregrounds and backdrops;
- Views from within an asset outwards over key elements in the surrounding landscape, such as the view from the principal room of a house, or from a roof terrace;
- Relationships with other features, both built and natural;
- Non-visual factors such as historical, artistic, literary, place name, or scenic associations, intellectual relationships (e.g. to a theory, plan, or design), or sensory factors; and,
- A 'sense of place': the overall experience of an asset which may combine some of the above factors."

Information Sources

Cultural Heritage Baseline Desk-Based Assessment

13.3.14 A review of relevant information, guidance and planning policy relating to the Proposed Development was undertaken to characterise the landscape and visual baseline of the Site and surrounding area including:

- Designation data downloaded from the Historic Environment Scotland website in March 2022 for records of designated heritage assets;
- The National Record of the Historic Environment (NRHE), including the Canmore database and associated photographs, prints/drawings and manuscripts held by HES;
- Historic Environment Record (HER) data, updated digital extract received from West of Scotland Archaeology Service (WoSAS), received June 2021
- Historic Landscape Assessment data, viewed through the HLAMap website;
- Geological data available online from the British Geological Survey;
- Previous site investigation reports;

- Historic maps held by the National Library of Scotland;
- Unpublished maps and plans held by the National Records of Scotland;
- Relevant internet resources, including Google Maps, Google Earth, Bing satellite imagery and PastMap;
- Readily available published sources and unpublished archaeological reports;
- The historic mapping sequence corresponding with the Site was consulted to collect information on former land use and development throughout the later historic periods;
- The National Archives of Scotland was not visited as part of this assessment, since maps available from the National Library give sufficiently detailed information about the Site to allow a reliable assessment of its archaeological potential and inform any archaeological mitigation. An online search of the National Archives of Scotland catalogue took place for the parish of Bonhill but produced no items of further interest;
- The subscription based NCAP website was used to access available aerial photographs. It is considered that the aerial photographs available online are sufficient to inform this assessment; and,
- LiDAR survey data supplied by the Scottish Government, covering both the West Riverside and Woodbank sites was processed in order to enable archaeological interpretation of the results. A Hill-Shade Relief model was used, with two separate simulated light angles applied from azimuths of 315 and 45 degrees.

13.3.15 Designated heritage assets are labelled with the reference number assigned to them by HES (prefixed SM for Scheduled Monuments, and LB for Listed Buildings); non-designated assets are labelled with the reference number in the WoSAS HER (prefixed WoSAS) or the NRHE (prefixed Canmore). Heritage assets within the Site have been assigned a 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. Assets within the Site are shown in **Figure 13-1**, with detailed descriptions compiled in a Cultural Heritage Baseline Desk-based Assessment (**Appendix 13.1**). All heritage assets within the Study Area are shown in **Figure 13-2** and **Figure 13-3** in **Appendix 13.2**.

Site Visit

13.3.16 The original site visit was made on 20th December 2016. An updated site visit for the revised Proposed Development was undertaken on 5th April 2022 in rainy conditions during which notes were made regarding site characteristics, any visible archaeology and geographical/geological features which may have a bearing on previous land use and archaeological survival, as well as those which may constrain subsequent archaeological investigation. Records were made regarding extant archaeological features, such as earthworks or structural remains, any negative features, local topography and aspect, exposed geology, soils, watercourses, health and safety considerations, surface finds, and any other relevant information.

13.3.17 The setting of the Site in relation to nearby heritage assets was also considered. The visibility within Drumkinnon Wood was limited due the heavy tree coverage.

Potential for Unknown Heritage Assets Within the Site

13.3.18 The likelihood that undiscovered heritage assets may be present within the Site is referred to as archaeological potential. Overall levels of potential can be assigned to different landscape zones, following the criteria in **Table 13-1**, while recognising that the archaeological potential of any zone will relate to particular historical periods and types of evidence. The following factors are considered in 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 13-1: 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.

Identification of Potential Effects

13.3.19 Effects on the historic environment can arise through direct physical impacts, impacts on setting or indirect impacts:

- Direct physical impacts describe those development activities that directly cause damage to the fabric of a heritage asset. Typically, these activities are related to construction works and will only occur within the Site;
- An impact on the setting of a heritage asset occurs when the presence of a development changes the surroundings of a heritage asset in such a way that it affects (beneficially or adversely) the cultural significance of that asset. Visual impacts are most commonly encountered but other environmental factors such as noise, light or air quality can be relevant in some cases. Impacts may be encountered at all stages in the life cycle of a development from construction to decommissioning but they are only likely to lead to significant effects during the prolonged operational stage of the development; and,
- Indirect impacts describe secondary processes, triggered by the development, that lead to the degradation or preservation of heritage assets. For example, changes to hydrology may affect archaeological preservation; or changes to the setting of a building may affect the viability of its current use and thus lead to dereliction.

13.3.20 Likely significant direct or indirect effects on known and unknown heritage assets are discussed in terms of the risk that a significant effect could occur. The level of risk depends on the level of archaeological potential combined with the nature and scale of disturbance associated with construction activities and may vary between high and negligible for different elements or activities associated with a development, or for the development as a whole.

13.3.21 Likely significant effects on the settings of heritage assets are identified from an initial desk-based appraisal of data from HES and the HER, and consideration of current maps and aerial images. Photomontage visualisations have been prepared to illustrate changes to key views, and to aid assessment where potential setting effects have been identified (Volume 2). The visualisations have been produced by the Landscape and Visual team, the methodology for preparing the photomontages is described in **Chapter 11: Landscape and Visual Impact**.

13.3.22 For any identified effect the preferred mitigation option is always to avoid or reduce effects through design, or through precautionary measures such as fencing off heritage assets during construction works to avoid accidental direct effects. Effects which cannot be eliminated in these ways will lead to residual effects.

13.3.23 Adverse direct or indirect physical effects may be mitigated by an appropriate level of survey, excavation, recording, analysis and publication of the results, in accordance with a written scheme of investigation (SPP paragraph 150 and PAN2/2011, sections 25-27).

Impact Assessment Criteria

Heritage Importance and Cultural Significance

13.3.24 Cultural heritage impact assessment is concerned with effects on cultural significance, which is a quality that applies to all heritage assets, and as defined by Historic Environment Scotland (Environmental Impact Assessment Handbook, NatureScot & HES 2018, v5 **Appendix 1** page 175), relates to the ways in which a heritage asset is valued both by specialists and the public. The cultural significance of a heritage asset will derive from factors including the asset's fabric, setting, context and associations. This use of the word 'significance', referring to the range of values attached to an asset, should not be confused with the unrelated usage in EIA where the significance of an effect reflects the weight that should be attached to it in a planning decision.

13.3.25 The importance of a heritage asset is the overall value assigned to it based on its cultural significance, reflecting its statutory designation or, in the case of non-designated assets, the professional judgement of the assessor (**Table 13-2**). Heritage assets of national importance and international importance are assigned a high and very high level respectively. Scheduled Monuments, Inventory Gardens and Designed Landscapes, Inventory Historic Battlefields and Historic Marine Protected Areas are, by definition, of national importance.

13.3.26 The criterion for Listing is that a building is of 'special architectural or historic interest'; following DPSG Annex 2.19, Category A refers to 'outstanding examples of a particular period, style or building type', Category B to 'major examples of a particular period, style or building type', and Category C to 'representative examples of a particular period, style or building type'.

13.3.27 Any feature which does not merit consideration in planning decisions due to its cultural significance may be said to have negligible heritage importance; in general, such features are not considered as heritage assets and are excluded from the assessment (see accompanying Cultural Heritage Baseline Desk-based Assessment (**Appendix 13.1**).

Table 13-2: Criteria for Assessing the Importance of Heritage Assets

Importance	Criteria
Very High (International)	World Heritage Sites and other assets of equal international importance, that contribute to international research objectives
High (National)	Inventory Gardens and Designed Landscapes, Scheduled Monuments, Protected Wreck Sites, Inventory Historic Battlefields, Category A and B Listed Buildings, Historic Marine Protected Areas, and non-designated heritage assets of equivalent importance that contribute to national research objectives.
Medium (Regional)	Conservation Areas, Category C Listed Buildings, undesignated assets of regional importance except where their particular characteristics merit a higher level of importance, heritage assets on local lists and non-designated assets that contribute to regional research objectives.
Low (Local)	Locally listed heritage assets, except where their particular characteristics merit a higher level of importance, undesignated heritage assets of Local importance, including assets that may already be partially damaged.
Negligible	Identified historic remains of no importance in planning considerations, or heritage assets and findspots that have already been removed or destroyed (i.e., 'site of').
Unknown/ Uncertain	Heritage assets for which a level of importance cannot be defined based on current information.

13.3.28 Cultural significance is assessed in relation to the criteria in DPSG Annexes 1-6, which are intended primarily to inform decisions regarding heritage designations but may also be applied more generally in identifying the 'special characteristics' of a heritage asset, which contribute to its significance and should be protected, conserved and enhanced according to SPP paragraph 137. Annex 1 is widely applicable in assessing the cultural significance of archaeological sites and monuments, for instance, while the criteria in Annex 2 can be used in defining the architectural or historic interest of buildings, whether listed or not.

13.3.29 The special characteristics which contribute to an asset's cultural significance may include elements of its setting. Setting is defined in 'Managing Change in the Historic Environment: Setting' (HES 2016 updated 2020, Section 1) as 'the way the surroundings of a historic asset or place contribute to how it is understood, appreciated and experienced'. The setting of a heritage asset is defined and analysed according to Stage 2 of the three-stage approach promoted in 'MCHE: Setting', with reference to factors listed on pages 9-10 (see Assessment of the magnitude of impacts on cultural significance, below). The relevance of these factors to

the understanding, appreciation and experience of the asset determines how, and to what extent, an asset's cultural significance derives from its setting. All heritage assets have settings; however, not all assets are equally sensitive to effects on their settings. In some cases, setting may contribute very little to the asset's significance, or only certain elements of the setting may be relevant.

Assessment of the Magnitude of Impacts on Cultural Significance

13.3.30 The magnitude of an impact is a measure of the degree to which the cultural significance of a heritage asset will potentially change as a result of the Proposed Development (NatureScot & HES 2018, Environmental Impact Assessment Handbook, v5 **Appendix 1**, para 42). This definition of magnitude applies to likely effects on the setting as well as likely physical effects on the fabric of an asset.

13.3.31 The methodology adopted for the identification and assessment of potential effects on setting follows the approach set out in Managing Change in the Historic Environment: Setting (Historic Environment Scotland, 2016 updated 2020) and the Environmental Impact Assessment Handbook (NatureScot & HES, 2018, v5 **Appendix 1**). The guidance sets out three stages in assessing the effect of development on the setting of a heritage asset or place as follows:

- Stage 1: Identify the historic assets that might be affected by a development;
- Stage 2: Define and analysis the setting by establishing how the surroundings contribute to the ways in which the historic asset or place is understood, appreciated and experienced; and,
- Stage 3: Evaluate potential effect of the proposed changes on the setting, and the extent to which any negative effects can be mitigated.

13.3.32 It is important to note that the magnitude of an effect resulting from an effect on setting is not a direct measure of the visual prominence, scale, proximity or other attributes of the Proposed Development itself, or of the extent to which the setting itself is changed. Moreover, it is necessary to consider whether, and to what extent, the characteristics of the setting which would be changed contribute to the asset's cultural significance (NatureScot & HES 2018, Environmental Impact Assessment Handbook, v5 **Appendix 1**, paras 42 and 43).

13.3.33 Impact magnitude is assessed as high/medium/low/negligible, and adverse or beneficial, or no effect, using the criteria in **Table 13-3** as a guide. In assessing the likely effects of a development, it is often necessary to take into account various effects which affect an asset's cultural significance in different ways, and balance adverse effects against beneficial effects. For instance, there may be adverse effects on an asset's fabric and beneficial effects on cultural significance resulting from change in setting arising from a development which would not otherwise occur in a 'do-nothing' scenario; a heritage asset that might otherwise degrade over time could be preserved or consolidated as a consequence of a development. The residual effect is an overall measure of how the asset's significance is reduced or enhanced.

Table 13-3: Criteria for Assessing the Magnitude of Impacts on Heritage Assets

Magnitude	Description
High Beneficial	Alterations to an asset and/or its setting resulting in considerable enhancement of cultural significance. Or Preservation of an asset and/or its setting where it would otherwise suffer considerable loss of cultural significance in the do-nothing scenario.
Medium Beneficial	Alterations to an asset and/or its setting resulting in moderate enhancement of cultural significance. Or Preservation of an asset and/or its setting where it would otherwise suffer moderate loss of cultural significance in the do-nothing scenario.
Low Beneficial	Alterations to an asset and/or its setting resulting in a slight enhancement of cultural significance. Or Preservation of an asset and/or its setting where it would otherwise suffer slight loss of cultural significance in the do-nothing scenario.
Negligible Beneficial	Alterations to an asset and/or its setting resulting in a very slight enhancement of cultural significance.

Magnitude	Description
	Or Preservation of an asset and/or its setting where it would otherwise suffer very slight loss of cultural significance in the do-nothing scenario.
No Effect	The asset's cultural significance is not altered.
Negligible Adverse	Alterations to an asset and/or its setting resulting in a very slight loss of cultural significance.
Low Adverse	Alterations to an asset and/or its setting resulting in a slight loss of cultural significance.
Medium Adverse	Alterations to an asset and/or its setting resulting in a moderate loss of cultural significance.
High Adverse	Alterations to an asset and/or its setting resulting in a considerable loss of cultural significance.

Assessment of the Significance of Effects

13.3.34 The significance of an effect ('EIA significance') on the cultural significance of a heritage asset, resulting from a direct or indirect physical effect or an effect on its setting is assessed by combining the magnitude of the impact and the importance of the heritage asset. The matrix in **Table 13-4** provides a guide to decision-making but is not a substitute for professional judgement and interpretation, particularly where the asset importance or effect magnitude levels are not clear or are borderline between categories. EIA significance may be described on a continuous scale from negligible to substantial.

Table 13-4: Criteria for Assessing the Significance of Effects on Heritage Assets

		Magnitude of Impact			
		High	**Medium**	**Low**	**Negligible**
Importance	**Very High**	Substantial	Substantial	Major	Moderate
	High	Substantial	Major	Moderate	Minor
	Medium	Moderate	Moderate	Minor	None
	Low	Minor	Minor	Negligible	None

13.3.35 It is common practice to identify EIA effects as significant or not significant, and in this assessment **substantial, major** and **moderate** effects are regarded as 'significant' in EIA terms, while minor, negligible and no effects are 'not significant'.

13.3.36 Impact assessment conclusions upon Scheduled Monuments are also presented in the terms of SPP paragraph 145 i.e. *"Where there is potential for a proposed development to have an adverse effect on a scheduled monument or on the integrity of its setting".* SPP does not define 'integrity' in the context of paragraph 145, therefore for the purposes of the assessment, the integrity of a setting is considered to be maintained if the principal characteristics of the setting that contribute to the cultural significance of the asset are retained, and it continues to be possible to appreciate and understand the Scheduled Monument in its setting.

Assessment of Cumulative Effects

13.3.37 Cumulative effects can occur when other proposed developments would also be visible in views that are relevant to the setting of a heritage asset. There are no other proposed developments to which these criteria apply and therefore cumulative effects have been scoped out of this assessment.

13.4 Baseline

Geology and Geomorphology

13.4.1 The bedrock, formed approximately 398 to 407 million years ago in the Devonian Period, comprises extensive sandstone deposits making up the Teith Sandstone Formation. These rocks were formed from river depositing mainly sand and gravel detrital material in channels to form river terrace deposits, with fine silt and clay from overbank floods forming floodplain alluvium, and some bogs depositing peat (BGS, accessed 22nd March 2022).

13.4.2 The superficial geology of the area is Glaciofluvial Deposits of Gravel and Raised Marine Deposits of Flandrian Age which are made up of clay, sand and silt. The valley now occupied by Loch Lomond is largely a product of the Pleistocene ice, a number of earlier valleys having

been integrated by some 2,000 feet of glacial down-cutting. There is evidence to show that just before the last ice advanced into the basin the sea flooded in the Lomond hollow, leaving marine shells to be picked up by the succeeding ice and deposited in the terminal moraines (Whittow 1997, 193)

13.4.3 The area as a whole would have consisted of shallow seas and rivers after the last Ice Age. A Hillside Relief Model created using LiDAR data shows the Site to be located in a flood-plain with the edge of a river terrace running north-south on the western edge of the Woodbank part of the Site.

Overview of the Historic Environment

13.4.4 The full list of known heritage assets within the Site and Study Area is presented in the gazetteer of **Appendix 13.1**.

13.4.5 These are discussed chronologically in the Archaeological and Historical Narrative (Part 5.4) of **Appendix 13.1** and the significance of these assets is discussed in the Statement of Significance and Importance (Part 6) **of Appendix 13.1**.

Heritage Assets Within the Site

13.4.6 There is one designated heritage assets within the Site:

- The Category A listed Woodbank House with Garden Building (LB1125).

13.4.7 There are five known non-designated heritage assets within the Site:

- The disused railway line (HA1) connecting to the steamer pier north of the Site;
- The former Balloch Station building (HA2), which survives as a private residence;
- The course of the Dumbarton to Tyndrum Military Road (HA3), preserved today as the Old Luss Road. HA3 continues along the Old Luss Road outside the Site as HER 22377;
- Stables associated with Woodbank House (HA4); and,
- A small outbuilding, possibly a bothy (HA5), at the north of the grounds of Woodbank House with Garden Building (LB1125)

13.4.8 The stables (HA4) associated with Woodbank House and Garden Building are recorded on the NRHE (Canmore ID 316753); HA2 and HA3 are recorded on the WoSAS HER, and HA1 and HA5 were identified from historic mapping as part of this assessment.

Heritage Assets Within the Study Area

13.4.9 There are no World Heritage Sites, Inventory Historic Battlefields, or Conservation Areas within the Study Area.

13.4.10 Within the Study Area there are two Scheduled Monuments, one of which lies within an Inventory Garden and Designed Landscape. There are also four Listed Buildings within the IGDL.

13.4.11 There are 14 Listed Buildings within the Study Area (in addition to those within the Balloch Castle IDGL). They include one Category A; nine Category B, and four Category C-listed Buildings.

13.4.12 There are 42 non-designated heritage assets within the Study Area.

Historic Land-Use Assessment (HLA)

13.4.13 The Historic Land-use Assessment map (hlamap.org.uk, accessed 04/04/22) indicates historic sand and gravel extraction close to the north-eastern edge of the Site, around what is now the Loch Lomond Shores car park and visitor centre; the OS mapping from 1899 onwards depicts ‘sand pits’ in this area. Areas of disturbance are visible on aerial photographs, and it is likely the area was used for quarrying sand in the first half of the twentieth century.

Previous Investigations

13.4.14 Discounting the previous iteration of this assessment for the earlier planning application, no other investigations have taken place previously within the Site.

13.4.15 Over the last two decades, a number of archaeological investigations including evaluations, watching briefs, field surveys, and excavations have taken place in and around the Study Area. Of particular note was a series of trial trenching evaluations and excavations carried out near Vale of Leven Hospital, approximately 1km south of the Site, which revealed prehistoric activity (WoSAS Event ID 4699, 4993 and 4994).

13.4.16 An archaeological evaluation was undertaken ahead of construction works connected with a bridge over the River Leven and revealed 18th-19th century occupation (WoSAS Event ID 562).

13.4.17 One further investigation is recorded on the HER within the Study Area; WoSAS Event ID 565 records a 1998 non-intrusive survey north of Balloch Castle (SM3385).

Archaeological and Historical Narrative

Prehistoric Periods

13.4.18 There is one Scheduled Monument (SM) within the Study Area, 'Cameron Home Farm, chambered cairn 720m S of' (SM6341), a Neolithic chambered cairn, of the Clyde-Solway group, which lies on the perimeter of Cameron Wood. In about 1800 the cairn was partly investigated, leading to the discovery of stone arrowheads and bone in some of the 20-25 'graves' which were subsequently reported. A cutting about 4m wide and 3m deep, presumably an earlier excavation trench, has been made the entire length of the cairn and three, possibly four, burial chambers remain exposed.

13.4.19 Excavations carried out at Vale of Leven Hospital, Alexandria (WoSAS Event ID 4699, 4993 and 4994) revealed a substantial amount of prehistoric activity. Over 100 features were excavated, including fire-pits and pits containing structured deposits of prehistoric pottery, the majority of which appeared to be Grooved Ware from the late Neolithic period. A number of lithics crafted from quartz, flint and pitchstone were also recovered. The remains of a ring-groove structure, of likely later prehistoric date were also excavated, along with a ditch.

Medieval and Post-Medieval Periods

13.4.20 Woodbank House with Garden Building (LB1125), a Category A listed building, is located in the south-western corner of the Site and is largely an eighteenth-century construction with later additions and alterations. The land around it was settled on James Lindsay and his wife Sarah in 1670, and a house known as Stuckrodger stood on the site at this time. In 1774 Stuckrodger was acquired by Charles Scott of Dalquhurn, a Glasgow merchant, who renamed it Woodbank and it appears that the house, as it now appears, dates from this time. In 1885 William Ewing-Gilmour of Croftenga was the occupant of the house and it is likely that the later additions date from his occupancy. The house was converted to a hotel in the 1930s.

13.4.21 The earliest map that depicts the house is Blaeu's Map of 1654 where it is annotated as a house along with nearby Cameron House and is called 'Stochrothart'. Roy's Map of 1747-55 also depicts four or five houses and woodland landscaping within the 'Stuckrodger' estate. Ainslie's map of 1821 labels the estate with the names of 'Stockroger' and 'Woodbank'. By John Thomson's map of 1832, the estate is definitively named Woodbank and is also annotated with 'Miss Scott', presumably indicating the proprietor, likely a relation of Charles Scott. The estate continues to be depicted on all maps, including 20th century Ordnance Survey maps which show it as Woodbank Hotel which continued in use, trading as the Hamilton House Hotel into the 1980s. The stables (HA4) is shown on the 1st Edition Ordnance Survey map of 1864, with the possible bothy (HA5) located at the north of the grounds for Woodbank House with Garden Building shown on the 2nd Edition Ordnance Survey of 1899.

13.4.22 The site of Balloch Castle (SM3385), a medieval castle pre-dating the existing Balloch Castle (LB123, Category A-listed), is located above the east bank of the Riven Leven. It was the property of the Earls of Lennox until 1652 when it was purchased by Sir John Colquhoun of Luss. In the 15th century the Castle became the property of the family of Stewart, Lords Darnley, who were afterwards regranted the title of Earls of Lennox. By 1511 it had been replaced by Inchmurrin as "the chief messuage" of the Earldom of Lennox; and after this period Balloch was gradually deserted. Nothing now remains except a mound surrounded by a ditch (Fraser 1869). The castle is depicted as 'Bellach' on Blaeu's Map of 1654 and 'Ballich' on Charles Ross' 1777 Map, but neither shows any detail of location. It appears as an earthwork from the 1864 1st Edition Ordnance Survey Map with the later castle (LB123) in the location it occupies today.

13.4.23 The existing Balloch Castle (LB123) was built in 1809 by Robert Lugar for John Buchanan of Ardoch, a wealthy shipbuilder and banker. The design for the castle was influential in the development of secular Gothic style. The castle is now largely disused, with the exception of some rooms at the rear of the structure. The estate is open to the public as a country park. It is also designated as an Inventory Garden and Designed Landscape (GDL00042). Robert Lugar also built Tullichewan Castle (WoSAS 7051) to the south-west of the Site. Built in 1792 and demolished in 1954, the castle is mentioned in both the Old and New Statistical Account (NSA) of the parish of Bonhill.

Modern Period

13.4.24 The 1st edition OS Map shows that the shoreline of Loch Lomond is largely unaltered since the 1860s. Drumkinnon Bay Winch House including Slipway is a Category A-listed Building (LB46721), and Balloch Pier (WoSAS 21743) and Balloch Pier Station (HA2) are recorded on the HER. The station was opened in 1850, and later renamed Balloch Pier Station. It closed on 29 September 1986, the line subsequently terminating at Balloch Central Station (Butt 1995). The pier and slipway was built c. 1899 by the Dumbarton & Balloch Joint Line Committee and is noted on Bartholomew's Map of 1902. It consisted of a 2-track 'patent slip', with a wooden cradle and iron outriggers supported on a double central rail, with ratchet in the centre, and single side rails. At the head of the slipway was a single-storey harled winding-engine house, containing a large steam winch (Hume 1976).

13.4.25 Just outside the Site in what is now the Loch Lomond Shore visitors' car park, a building named 'Drumkinnan' is illustrated on the 1st edition OS Map. The Ordnance Survey Name Book (1860) describes Drumkinnan as an old farmstead but no record exists of when it went out of use. The site is not recorded on the HER.

13.4.26 Aerial photography and the 1938 OS Map shows the site of 'Loch Lomond Factory (silk dyeing & finishing)' just beyond the southern edge of the Site. The housing estate around Inchcruin and Clairinish now occupies the site.

Archaeological Potential of the Site

13.4.27 The prehistoric features excavated at Vale of Leven Hospital (WoSAS Event ID 4699, 4993 and 4994) and the Neolithic cairn (SM6341) in Cameron Wood suggests that there is potential for further prehistoric activity in the area. The Site is in an area of low-lying, fertile land beside Loch Lomond. The loch is part of a historic maritime network linking the highlands with central Scotland. There are also links to medieval seats of power with the Earls of Lennox having their base at Balloch Castle for a long period of time. Such links would have been influential on the landscape and assets relating to this period may survive.

13.4.28 It would appear likely that most of the Site was under agricultural use and partially forested from at least the medieval period until the recent past. If heritage assets survive, they are likely to comprise field boundaries, furrows or perhaps structures relating to the agricultural use of the land. Historic mapping suggests some parts of the Site may have been quarried in the post-medieval and modern period which may have implications for the survival of any unknown remains dating prior to this period.

13.4.29 With the above factors taken into account and according to the criteria in **Table 13-1**, the Site is considered to be of medium archaeological potential.

Heritage Assets Considered for Setting Effects

13.4.30 Following a Stage 1 Setting Assessment and consultation with HES the following heritage assets have been retained for detailed assessment in this chapter:

- Category A Listed Woodbank House with Garden Building (LB1125) and stables (HA4);
- Category A Listed Drumkinnon Bay Winch House including Slipway (LB46721);
- Category A Listed Balloch Castle (LB123) and Inventory Garden and Designed Landscape (GDL00042); and,
- Scheduled Balloch Castle earthwork (SM3385).

13.4.31 The views from Balloch Castle GDL (as well as LB123 Balloch Castle and SM3385 Balloch Castle which lie within the designed landscape) were intended to take in the southern end of

Loch Lomond at least partially. As such it is possible visual change caused by the Proposed Development could impact the cultural significance of these heritage assets.

13.4.32 The addition of buildings in the vicinity of Drumkinnon Bay Winch House including Slipway (LB46721) may introduce visual distraction when viewing it from Loch Lomond and from the shores.

13.4.33 The introduction of lodges and bothies within the grounds of LB1125 Woodbank House with Garden Building may change the relationship between the house and its grounds.

13.5 Embedded Mitigation

13.5.1 As detailed in **Chapter 3 – EIA Process**, a number of design features and embedded mitigation measures have been incorporated into the design of the Proposed Development to avoid, prevent or minimise significant adverse environmental effects and to enhance beneficial effects. Embedded mitigation measures of relevance to this assessment are:

- Avoiding construction of lodges or bothies on ground to the east of Woodbank House with Garden Building LB1125 to ensure the visual relationship between the house and its grounds in this area as well as views to and from the house from Old Luss Road (HA3) are retained;
- Adherence to relevant HES regulatory and good practice guidance in construction methods- for assessment purposes it is assumed that the restoration of Woodbank House will be carried out in accordance with a Conservation Management Plan and any other necessary surveys (e.g., structural survey, historic building record (HBR) etc) required and agreed through further consultation to enable good practice to be achieved. A Conservation Management Plan will identify opportunities for enhancement, including but not limited to:
- Retention of the east (principal) façade of Woodbank House LB1125;
- Conservation of the south façade of Woodbank House LB1125; and,
- Conversion of other Listed and non-listed buildings within the grounds of Woodbank House with Garden Building LB1125 where practicable and viable.

13.5.2 The detailed scope and timing of these measures will be developed and designed according to advice and guidance received from HES and submitted as part of a separate Listed Building Consent (LBC) application.

13.6 Assessment of Likely Effects

Construction Phase

Direct Impacts

13.6.1 There are six known heritage assets located within the Site. Of these, direct impacts are possible on one Category A Listed Building LB1125 and three non-designated heritage assets: HA1, disused railway line; HA4, stables; HA5, possible bothy.

13.6.2 Woodbank House with Garden Building LB1125 is of high importance. Woodbank House stables HA4, recorded on the NRHE, are also of high importance through their association with the house. The possible bothy HA5 located within woodland at the north of the grounds of Woodbank House is a later 19th century addition to grounds and, given its separation from the Woodbank House itself, is considered to be of low importance. The course of the Dumbarton to Tyndrum Military Road (HA3), preserved today as the Old Luss Road, continues along the Old Luss Road. This asset is considered to be of low importance.

LB1125 Woodbank House with Garden Building, HA4 and HA5

13.6.3 Under the current design for the Proposed Development, LB1125, the associated stables HA4, and the possible bothy HA5 located at the northern extent of the grounds for Woodbank House and Garden Building would be converted and renovated to provide apartments (LB1125), holiday accommodation (HA4) and facilities (HA5).

13.6.4 The ‘Garden Building’ or gazebo element of LB1125 Woodbank House with Garden Building is located within an overgrown and wooded area south of the southern façade of Woodbank

House. No development is programmed to take place within the area in which this feature is recorded as being present. No direct construction phase impacts are predicted on this element of LB1125 Woodbank House with Garden Building.

13.6.5 It is considered that conserving, restoring and returning these structures to use will halt deterioration and ensure their long-term viable use. Other buildings within the grounds of Woodbank House with Garden Building LB1125 will also be restored where practicable and viable.

13.6.6 It is assumed that appropriate surveys will be carried out in order to inform an appropriate Conservation Management Plan, implemented prior to construction commencing and ensuring appropriate ongoing maintenance, to meet the requirements of the relevant consultees (HES and WoSAS). The construction phase of the Proposed Development will therefore have a **medium beneficial** impact on LB1125 Woodbank House with Garden Building, stables HA4 and the possible bothy HA5. Possible bothy HA5 is an asset of low importance resulting in a **minor beneficial** significance of effect, which is **not significant** in EIA terms. LB1125 Woodbank House with Garden Building and stables HA4 are assets of **high** importance resulting in a **major beneficial** significance of effect, which is **significant** in EIA terms.

HA1, Disused Railway Line

13.6.7 The current design for the Proposed Development within the West Riverside area of the Site is for the installation of a monorail and holiday lodges along the footprint of HA1. Whilst there are no extant remains of the railway line, it is possible elements of it could exist as below ground features. A **high adverse** impact is predicted upon an asset of **low** importance leading to a significance of effect of **minor adverse** which is **not significant** in EIA terms.

Other Known Heritage Assets

13.6.8 The course of the military road (HA3) is preserved in the route of Old Luss Road; no historic fabric survives as upstanding remains. The development proposals also seek to preserve the old Balloch Station building (HA2). **No direct impacts** are anticipated upon HA2 or HA3.

Archaeological Potential

13.6.9 The Site is considered to be of medium archaeological potential. Direct construction impacts on previously unknown heritage assets in the Site are therefore possible.

13.6.10 An assessment of effect and significance cannot be meaningfully evaluated for unknown heritage assets, as neither the cultural significance of the asset nor the magnitude of the impact can be known. Consequently, only the likelihood of construction effects is considered.

13.6.11 Based on the assessment of known heritage assets in the vicinity, which includes Medieval and prehistoric remains, and the suitability of the area for human settlement, any effect resulting from an impact upon archaeological remains discovered during the construction-phase may, in the absence of further mitigation, be of up to **moderate adverse** effect significance which is **significant** in EIA terms.

Construction Phase Setting Effects

13.6.12 The assessment of potential setting effects upon heritage assets within the Site and Study Area as a result of the construction stage of the Proposed Development, through the introduction of increased traffic, construction noise/dust, and the visual intrusion of cranes etc to the landscape, is the same as those assessed under ‘operational effects’ below, although construction effects would be temporary and therefore **not significant** in EIA terms due to their very short duration.

Operational Phase

Woodbank House With Garden Building LB1125 and Stables HA4

13.6.13 Woodbank House with Garden Building is a Category A-listed building consisting of a modest eighteenth-century mansion and an associated gazebo, and stables (HA4). Built on the site of an earlier 1670s house, the present building dates to the 1770s with a nineteenth-century extension added to the south. Occupied until the 1980s, Woodbank was most recently in use as a hotel, and minor alterations relating to this use are apparent in the building’s fabric. Following the hotel’s closure, the building has gradually fallen into disrepair, and is currently in a ruinous and unsafe state as a result of vandalism and exposure to the elements. The roof has fallen in, causing the collapse of the upper floors and staircases, and the ground floors and

cellars are dilapidated, rubble-strewn and overgrown. Included in the listing is a small octagonal wooden gazebo (i.e. 'Garden Building') recorded on the list entry for Woodbank House and Garden Building as being near the house but was not visible at the time of the site visit. It is possible elements of the structure survive within the wooded area immediately south of the southern façade of Woodbank House itself. The stable block and garages to the north are not listed but are included on the HER and are also considered to be assets of high importance (**Appendix 13.1**, Section 6.1.2).

13.6.14 Woodbank House with Garden Building is in the south-western corner of the Site and stands at the top of a low ridge on the western edge of pasture on the Old Luss Road. Mature woodland surrounds the house, and historic mapping indicates that the borders and footprint of this woodland, and the surrounding fields, appear largely unchanged since the mid-19th century (**Figure 13-4**, **Appendix 13.2**). West of the house, the trees form a shelter belt, and define the edge of the modest grounds of the house. East and north of the house, the land slopes away and is currently under rough pasture.

13.6.15 Woodbank House with Garden Building and the stables derive their cultural significance from their architectural and historical interest built by a wealthy Glasgow merchant as a modest country house. Contextually, the house derives its cultural significance from its situation which originally provided views to the east, over the grounds and fields to the hills beyond Balloch – at the time, a small village. However, the nineteenth-century extension appears to have made the southern façade the main entrance to the house, with a new driveway from the Lower Stoneymollan Road.

13.6.16 The house is approached from the Old Luss Road along the original straight driveway, now a rough track, gravelled in places; the avenue of trees depicted on Roy's map does not survive. The original 1775 eastern façade of the house can be glimpsed through the trees from Old Luss Road, but the full extent of the house is not visible (Viewpoint 06, **Appendix 12.5**). As the drive enters the woodland, it begins to curve to the south whilst climbing the low ridge, and winds along the eastern edge of the woodland, giving the impression of a long approach to the house through the trees. From the curving drive, there are views across the lower fields east towards houses on the Old Luss Road, and the low hills south-east of Balloch and Jamestown. The existing developments on the shore of Loch Lomond are not visible in these views. Although now in an overgrown state, it is clear the tree planting has allowed for the house to be partially concealed yet still visible (**Image 13-1**); with the house glimpsed from the road on the south-easterly approach but hidden from view when approached along the driveway from the north-east.

Image 13-1: View South of Woodbank House from Track

13.6.17 Views from the eastern elevation of the house are largely screened by trees, however, gaps within the trees allow for views over the grounds to the east and towards Old Luss Road.

13.6.18 The driveway curves round to the southern façade of the house, a nineteenth-century addition which now constitutes the main entrance. Again, partially hidden by woodland (depicted on the historic OS mapping), the house can only be glimpsed from the Lower Stoneymollan Road approximately 100m to the south, across an area of open pasture. This careful screen planting appears designed to ensure privacy for the house at the centre of what is a very small estate (**Image 13-2**). From the southern elevation of the house, outward views are largely limited by the trees, and the overall impression is of a house designed to be relatively secluded within a small woodland setting. The drive continues southward to a gate onto Lower Stoneymollan Road – historic mapping indicates this drive and entrance were added in the nineteenth century when the extension was built.

13.6.19 The gazebo (or 'Garden Building') element of Woodbank House with Garden Building is not readily appreciable as a landscape feature. Its relationship with the house and grounds is therefore difficult to discern, although it is likely it functioned as a notable landscape feature within the grounds and from which to take in views of the wider garden.

Image 13-2: View NNW of Southern Elevation of Woodbank House from Southern Extent of its Grounds

13.6.20 The elements of the Proposed Development within the vicinity of Woodbank House with Garden Building (see **Appendix B)** would comprise up to 37 lodges within its grounds built in two groups: 22 lodges located at the north and 15 at the south. Sixteen woodland lodges and 17 woodlands bothies located to the west and north-west of the stables (HA4) are also proposed. The 15 lodges at the south of the grounds would be situated along the Lower Stoneymollan Road and would be built on the low-lying pasture to the south-east of the house. The second group of dwellings would be to the north-east, again on low-lying pasture along the Old Luss Road north of the original driveway. The woodland lodges and bothies would be dispersed throughout the shelter belt of trees to the west of Woodbank House. Existing woodland north-east of and alongside the Old Luss Road would be retained. Viewpoints 04-06 (**Appendix 12-5**) provide indicative visualisations of how the woodland lodges would appear within the grounds of Woodbank House with Garden Building.

13.6.21 The north-eastern group of dwellings would not be visible in views from the southern elevation and would only appear on the periphery of views from the eastern elevation. The location of Woodbank House, on a ridge of higher ground, means that eastward views would remain largely unaffected by the presence of the lodges north-east of the house. The Proposed Development around within the West Riverside area would also not constitute a change to these eastward views, as it would be screened by existing woodland. The second group of lodges at the south-east would appear in views to the south and south-east from both the southern and eastern elevations. However, views in these directions are considered to be of only limited relevance, screened as they are by trees which were intended to create a sense of seclusion associated with the house. The woodland bothies to the west and north-west of the house and stables would be screened by the woodland in which they are set. The 'Garden Building' or gazebo, recorded as being present to the south of Woodbank House does not appear to survive as an extant feature.

13.6.22 Despite the presence of elements of the Proposed Development in the vicinity, it would remain possible to appreciate and understand the contribution that setting makes to the cultural significance of Woodbank House with Garden Building, with the sense of seclusion which makes a key contribution to this setting retained. Views to the east across the grounds from the principal eastern elevation of the house and stables, whilst undergoing a level of visual change, would remain open and allow the visitor to experience how the house and stables relate to this area and Old Luss Road. Woodbank House is only partially visible when viewed from the grounds and whilst the presence of the lodges would constitute visual change in these views, it is considered there are no key designed views from the grounds back to the house that would be impacted upon. As such, the presence of the lodges would have only a limited impact on views of the house from the grounds. In outward views from the house, it would remain possible to understand, appreciate and experience the house within its secluded setting, with the proposed woodland lodges to the north, south and east of the house largely screened by trees. The woodland bothies to the west and north-west of the house and stables would be screened by the woodland in which they are set and would not change the relationship between the house and stables and the trees which form their backdrop.

13.6.23 It is considered there would be a **low adverse** operational impact upon LB1125 Woodbank House with Garden Building, and the stables HA4, assets of **high** importance. In the absence of further mitigation, this would result in a significance of effect of **moderate** which is **significant** in EIA terms.

Drumkinnon Bay Winch House Including Slipway LB46721

13.6.24 Drumkinnon Bay Winch House including Slipway is a Category A-listed Building (LB46721). Built in 1900-01 by the Dumbarton & Balloch Joint Line Committee, it is first depicted on Bartholomew's Map of 1902. It consisted of a 2-track 'patent slip', with a wooden cradle and iron outriggers supported on a double central rail, with ratchet in the centre, and single side rails. At the head of the slipway was a single-storey harled winding-engine house, containing a large steam winch (Hume 1976). The slipway was built to assist in servicing and maintaining the steam packets which ferried tourists and travellers along Loch Lomond in the late nineteenth and early twentieth century. Balloch Pier (WoSAS 21743), approximately 80m to the north-east was a terminus for trains from Glasgow via Dumbarton Junction, and passengers could easily alight from the train to embark on the steamers. This traffic gradually declined and by the 1920s the Balloch to Dumbarton was very limited with passenger traffic ceasing entirely in 1934 (http://www.west-dunbarton.gov.uk/leisure-parks-events/museums-and-galleries/collections/transport/rail/). The winch house fell into disuse and disrepair and remained abandoned for the remainder of the twentieth century. In 2006 the winch house was restored with Heritage Lottery funding and opened as a visitor attraction to complement the ongoing restoration of the paddle steamer 'Maid of the Loch'. The winch house machinery has been restored to working order, and the 'Maid' is currently berthed at Balloch Pier where she is undergoing restoration.

13.6.25 The Winch House and Slipway is on the southern shore of Loch Lomond, adjacent to but outside the north-eastern corner of the Site boundary. Historic mapping depicts it as being one of a number boat houses and jetties when it was first built, and a small jetty is still in use immediately adjacent to the slipway. The 1919 OS map depicts a footpath leading to the winch house from the centre of Balloch, which also gave access to the railway line. On shore and inland, the area around the winch house has been developed and now houses a number of car parks serving Loch Lomond Shores visitor centre and the jetty. There are areas of woodland planting which border the car parks and act as a natural screen between the developed shore and the northern suburbs of Balloch. The car parks have largely obscured the historic landward approach to the winch house, although the course of the railway line is still preserved as a footpath along the riverbank.

13.6.26 According to the HES listing entry the Winch House and Slipway are A-listed as 'a good example of a rare building type, particularly notable for the retention of its original machinery for the Dumbarton and Balloch Joint Line Committee.' The buildings' cultural significance derives almost entirely from its rarity and historic interest as a piece of industrial heritage with historical associations with Loch Lomond and Balloch. The buildings' immediate setting, on the shore of the loch, is relevant to cultural significance as is the relationship with Balloch Pier and the loch, as they relate to the buildings' collective function. Views to the south-west and south, inland,

are less relevant to its cultural significance and with the existing carparks and Loch Lomond Shores development, these views are in any case currently of limited sensitivity.

13.6.27 Elements of the Proposed Development in the north-eastern corner of the Site entail the construction of an apart-hotel, indoor water park and associated parking and a monorail station to the south of the winch house.

13.6.28 The hotel and water park would appear in views to the south-west from the winch house and in views south from Balloch Pier (Viewpoint 03, **Appendix 12.5**). These structures would also be visible in views south to the winch house and slipway from the loch (Viewpoint 25). Whilst the Proposed Development in this area would introduce additional modern buildings in the vicinity of the winch house and slipway, it would not fundamentally impact how the buildings are understood, appreciated and experienced as architecturally and historically important buildings. Views from and to the winch house and slip way are informative only in terms of understanding how the buildings function in relation to the loch and are of limited relevance to their cultural significance. The Proposed Development would not in any case obscure any views of the winch house and slipway, which would remain appreciable from within its immediate vicinity and from the loch. It would remain possible to fully understand, appreciate and experience the Winch House and Slipway in terms of their architectural and historical importance as well as how they functioned in relation to the loch.

13.6.29 It is considered there would be a **negligible adverse** operational impact upon Drumkinnon Bay Winch House including Slipway, an asset of **high importance**. In the absence of further mitigation, this would result in a significance of effect of **minor adverse** which is **not significant** in EIA terms.

Balloch Castle LB123, Inventory Garden and Designed Landscape GDL00042

13.6.30 Balloch Castle IGDL includes four Listed Buildings within its boundaries (**Figure 13-3**, **Appendix 13.2**). The South (LB43221) and North (LB43220) Gate Lodges are Category B and C listed respectively, the Walled Garden (LB43222) is Category B listed, and Balloch Castle (LB123) itself is a Category A listed estate house. As the IGDL is considered to define the setting of the buildings that contribute to its cultural significance, operational effects on the IGDL as a whole are assessed and these Listed Buildings will not be assessed separately.

13.6.31 The Inventory entry for Balloch Castle IGDL deems it of 'High' or 'Outstanding' value for its scenic, architectural, artistic, horticultural and nature conservation aspects. Designed in the early 1800s, the park was commissioned by John Buchanan to complement the Gothic-style castle he was building on a low-rise overlooking Loch Lomond. Planted with a variety of specimen trees, rhododendrons and areas of ornamental planting, the park is typical of early nineteenth century landscape parks and has remained largely unaltered since its establishment. The estate was in various private hands until 1915 when Glasgow City Corporation bought it, and the estate is currently a Country Park open to the public and maintained by West Dunbartonshire Council.

13.6.32 Although the original Balloch estate covered approximately 330 hectares, the IGDL only encompasses the 88Ha around the castle. As the Inventory entry describes:

13.6.33 *'[the IGDL] is situated on the south-east shore of Loch Lomond on the edge of the designated National Scenic Area, half a mile north of the town of Balloch and within easy walking distance of it. The Park is bounded to the west by Loch Lomond and the River Leven, to the north by the Burn of Balloch, and to the east by its woodland belts. The Park slopes gently westwards down to Loch Lomond, and the Castle is set on a high point taking full advantage of the spectacular views over the south end of Loch Lomond*.'

13.6.34 The IGDL derives its cultural significance from its intrinsic artistic design intended to provide a pleasant ornamental park landscape associated with Balloch Castle (LB123) and which was intended to improve the experience for visitors to the castle. Contextually, it derives its cultural significance from its designed views from Balloch Castle which take in near views of the parkland, and longer views across Loch Lomond to the Cameron estate on the far shore with views of mountains rising behind it.

13.6.35 From Loch Lomond Shores, the IGDL and Balloch Castle are only partially visible on the approach to the shores along the paved area which runs north-east from the car park at the south-west. From here, the castle is largely obscured by tree cover (**Image 13-3**) and is

completely screened by tree cover when looking in this direction from the vicinity of Drumkinnon Tower (Viewpoint 02, **Appendix 12.5**).

Image 13-2: View North-East from West of Loch Lomond Shore Showing Balloch Castle Amongst Trees

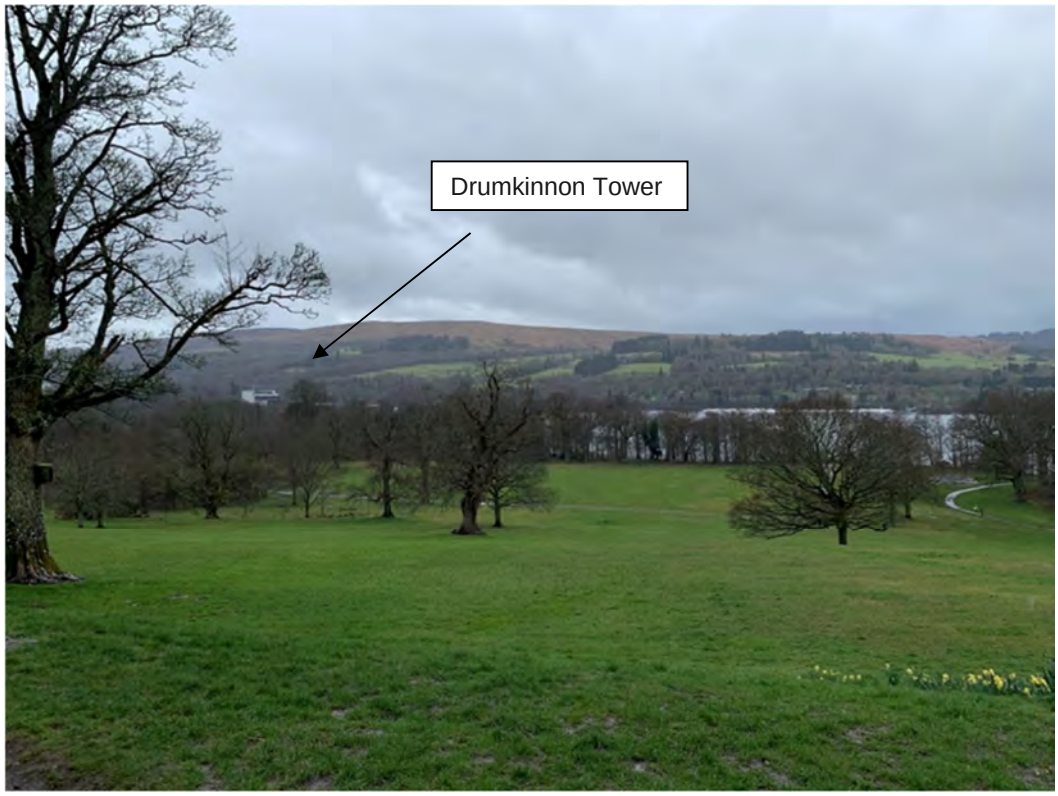
13.6.36 Currently the IGDL is most commonly approached from the southern car parks in Moss O'Balloch alongside the River Leven. A second, smaller car park beside the castle can be accessed from the eastern side of the IGDL. From the south, paths wind through woodland planted across the southern third of the IGDL. One path follows the bank of the river and allows glimpses of the far bank (which constitutes the eastern Site boundary) through the trees. These glimpsed views gradually open up as one approaches the mouth of the river, and the southern end of Loch Lomond becomes more visible. The riverside path continues along the loch side, following the perimeter of the IGDL. The 1864 OS mapping clearly depicts these woodland paths and the managed views across the loch. Other paths from the south take a more direct route towards the castle, passing the walled garden before leaving the ornamental woodland to cross an area of undulating landscaped parkland, planted with ornamental trees. From these paths the castle is a feature on the slopes to the east, but views west and north across the loch are still restricted by the loch side woodland. The mountains behind Luss and Auchentullich on the western shore of the loch are the principal topographic features in views from the parkland.

13.6.37 Viewpoint 08 (**Appendix 12.5**) indicates that the woodland lodges which would be present at the east of the Proposed Development would be visible through the trees when walking along the footpath the western extent of the IGDL along the River Leven. However, the level of tree coverage along this footpath in addition to the tree coverage along the western bank of the river means they will only be faintly visible and would not constitute a visual distraction when experiencing this area of the IGDL. To the south of this area, in the vicinity of the former Balloch Station (HA2) a brewery, budget accommodation, a restaurant, an amphitheatre and a monorail station are proposed (Viewpoint 10, **Appendix 12.5**). As with the woodland lodges, this part of the development would be screened by trees when walking along the path at the west of the IGDL and would not constitute a visual distraction.

13.6.38 Upon reaching the castle, in its position overlooking the parkland, views across the loch open up to the west and north. The ornamental trees and parkland form the foreground of these views,

which sweep away west and north, across the loch side woodland. In views to the south-west, the 36m high Drumkinnon Tower of the Loch Lomond Aquarium is just visible above the trees beyond the estate boundaries, with low hills rising to the south-west behind it (**Image 13-4**). To the west and north, across the sloping parkland, Loch Lomond can be seen curving away to the north, with mountains rising behind it. Views are drawn to these more open viewpoints, forming a key visual relationship between the castle, IGDL and the loch.

Image 13-3: View South-West From Balloch Castle



13.6.39 The tallest structure in the Proposed Development would be the apart hotel located within the West Riverside area of the Site which would stand at 11m tall. The existing Drumkinnon Tower stands at 36m in height. At the time of the setting visit in April 2022, the upper three floors of the Drumkinnon Tower were visible above the trees 900m south-west of Balloch Castle. It is therefore unlikely that the hotel would be easily visible from the castle, with the trees within the IGDL largely screening the structure from view. The remainder of the Proposed Development would not be visible from the IGDL as it would be either screened by existing woodland or located in areas of the Site which are not visible from the IGDL.

13.6.40 Views to the south-west from Balloch Castle are not considered to be key contributors to the cultural significance of the IGDL. As detailed in paragraph 13.6.37, the key outward views are considered to be those to the west and north across the loch. The Proposed Development would not appear in these views and would in any case be screened from view by tree cover in south-west facing views and almost completely screened by trees in views from the western extent of the IGDL. It would therefore remain possible to understand, appreciate and experience Balloch Castle and the IGDL and their key relationship to the loch and in terms of the reciprocal relationship between the castle and the IGDL grounds.

13.6.41 It is considered there would be a **negligible adverse** operational impact upon each of Balloch Castle (LB123) and Balloch Castle IGDL (GDL00042), assets of **high importance**. In the absence of further mitigation, this would result in a significance of effect of **minor** which is **not significant** in EIA terms.

Balloch Castle, Earthwork, Loch Lomond Park, SM3385

13.6.42 Balloch Castle, earthwork is a Scheduled Monument. It comprises a natural mound, surrounded by a ditch and traces of a bank, and represents the remnants of the original Balloch Castle. This was the first seat of the Lennox family and was abandoned in 1390 when they built a new castle on Inchmurrin Island, the southernmost of Loch Lomond's islands.

13.6.43 Exploiting a natural mound on the eastern bank of the River Leven, Balloch Castle is ideally located to monitor the river mouth, and the southern end of Loch Lomond, as well as overland routes along the eastern shore of the loch.

13.6.44 The monument derives its cultural significance from its intrinsic archaeological value with the potential through excavation to elucidate the nature of the earthwork and the nature of Medieval defensive structures. Contextually, the monument derives its cultural significance from its position at the mouth of the River Leven where it would have been possible to monitor movement on the loch.

13.6.45 The Scheduled Monument is currently partially overgrown, and the western half of the mound is within an area of trees know as 'Moat Wood'. The 1864 OS map (**Figure 13-4**, **Appendix 13.2**) depicts the earthworks, with woodland paths on two sides indicating that the castle was incorporated as a landscape feature on the Balloch Castle estate. Views out across the river mouth and loch are mostly restricted by the loch-side woodland of the Balloch estate, but it remains possible to appreciate and understand the reasons behind the Lennox's choice of location, albeit within a much reduced setting. Views westward are restricted by the trees, and the existing buildings around Loch Lomond Shores are not visible (**Image 13-5**).

Image 13-4: View South-East from Balloch Castle Earthwork

13.6.46 The Scheduled Monument is on the eastern bank of the River Leven approximately 75m from the Proposed Development. Currently, the western bank is forested and crossed by footpaths and woodland walks. It is the strategic views of the river mouth, the southern end of the loch and the northern approaches that are of most relevance to understanding the contribution made by setting to the earthwork's location and function.

13.6.47 Elements of the Proposed Development in this area would comprise the retention of the existing woodland at the mouth of the River Leven, directly opposite the Scheduled Monument. Further upstream to the south and south-east of the Scheduled Monument, it is proposed to build up to 43 single-storey lodges within the existing woodland. The proposed lodges are intended to be screened by the existing woodland, which will be largely retained. To the south of this area, in the vicinity of the former Balloch Station (HA2) a brewery, budget accommodation, a restaurant, an amphitheatre and a monorail station are proposed (Viewpoint 10, **Appendix 12.5**). This area of the Proposed Development would be screened by the extensive tree cover which surrounds the monument.

13.6.48 The Proposed Development would not be an obvious or obtrusive presence in the key strategic views from the Scheduled Monument. It is the strategic views of the river mouth, the southern end of the loch and the northern approaches that are of most relevance to understanding the contribution made by setting to the earthwork's location and function albeit these views are restricted by tree cover. It is considered that it would remain possible to understand, appreciate and experience the location of the monument in relation to the loch and river despite the presence of the Proposed Development to the west.

13.6.49 It is considered there would be a **negligible adverse** operational impact upon Balloch Castle earthwork SM3385, an asset of **high importance**. In the absence of further mitigation, this would result in a significance of effect of **minor** which is **not significant** in EIA terms and is not considered an adverse effect upon the integrity of the Scheduled Monument's setting.

Historic Landscape Effects

13.6.50 The north-east of the Site is broadly characterised by 20th century development, with mid to late 19th century features such as Balloch Pier (WoSAS 21743) and Balloch Pier Station (WoSAS 21640) also present. The Lomond Shore shopping area (Canmore 269762) comprising retail units and cafes along with an aquarium (Drumkinnon Tower) dominate this area and along with the early 20th century Drumkinnon Bay Winch House including Slipway LB46721, makes the receiving landscape of this area of the Site modern in character. As such it is receptive to sympathetic change, and it is considered that the Proposed Development would not appear out of character with the historic environment in the Site.

13.6.51 The grounds of Woodbank House with Garden Building (LB1125) have remained largely unchanged since the mid-19th century and as such remain identifiable as a late post-medieval landscape used for rough pasture. Whilst the Proposed Development would introduce modern elements into this landscape through the introduction of lodges and bothies, it is considered that this would not fundamentally change the ability of visitor to understand and appreciate the how this area would have functioned historically. The proposed design is sympathetic and the layout is heritage-led such that the grounds at the east of Woodbank House with Garden Building (LB1125) would remain free from any development and would retain their appearance as an area historically used for rough pasture which contributes to the cultural significance of the house. In addition, the Proposed Development would halt degradation, restore and return Woodbank House, the stables to the north (HA4) and the possible bothy (HA5) to use, allowing for their long-term appreciation as garden features.

13.6.52 Across the Site as a whole, historic woodlands are, for the most part, to be retained other than where their thinning enhances sightlines through the Site, and no significant field boundaries (such as hedges or walls) that contribute to landscape character are proposed for removal.

13.6.53 It is considered the historic landscape within the Site as a whole is receptive to sympathetic change and the Proposed Development would have no more than a **negligible adverse** operational impact on the historic landscape. It is considered that this would result in a significance of effect of no more than **minor**, which is **not significant** in EIA terms.

13.7 Further Mitigation and Enhancement

13.7.1 The preferred mitigation option in relation to archaeology and cultural heritage is always to avoid or reduce impacts through design, or through precautionary measures such as fencing off heritage assets during construction works. Impacts which cannot be eliminated in these ways will lead to residual effects.

13.7.2 Direct effects may be mitigated by an appropriate level of survey, excavation, recording, analysis and publication of the results, in accordance with a written scheme of investigation (PPS6 Policy BH4). Archaeological investigation can have a beneficial effect of increasing knowledge and understanding of the asset, thereby enhancing its archaeological and historical interest and offsetting adverse effects.

Construction Phase

Direct Impacts

13.7.3 Direct impacts during the construction phase are predicted on Woodbank House with Garden Building (LB1125) and stables (HA4), a possible bothy (HA5), and disused railway line (HA1).

13.7.4 A Conservation Management Plan will be produced by a suitably experienced historic buildings professional in consultation with HES.

13.7.5 All advance field assessments and construction phase mitigation would be detailed in a Written Scheme of Investigation (WSI) which would be agreed with WoSAS.

13.7.6 The following mitigation is proposed:

Woodbank House With Garden Building LB1125, Stables HA4 and Possible Bothy HA5

13.7.7 A programme of historic building recording (HBR) is recommended to be undertaken to an appropriate level prior to restoration works commencing in order to ensure an accurate record of all structures which may be altered during restoration.

13.7.8 The results of the HBR work will be used to inform a Conservation Management Plan which in turn will identify opportunities for enhancement in the design of a flexible approach to the preservation of remaining facades of Woodbank House with Garden Building and the restoration where viable of associated structures.

HA1 Disused Railway Line

13.7.9 A programme of trial trenching is recommended within the unforested areas along the footprint of HA1 to ensure any below ground elements of the rail line, and any other potential below ground remains, are recorded prior to construction commencing.

Potential Below Ground Remains

13.7.10 The Site is considered to be of medium potential for previously unrecorded archaeological remains. A programme of trial trenching is recommended prior to construction commencing in order to ensure any previously unrecorded below ground remains are identified. Should significant remains be uncovered, a programme of mitigation excavation is recommended in order to ensure any such remains are fully recorded prior to construction commencing.

Construction Phase Setting Effects

13.7.11 No significant construction phase setting effects have been identified. No mitigation is recommended.

Operational Phase

LB1125 Woodbank House with Garden Building and Stables HA4

13.7.12 Adverse operational effects of **moderate significance** have been identified on LB1125 Woodbank House with Garden Building and stables HA4. Embedded mitigation and enhancement measures have been applied in order to minimise the magnitude of potential impacts as a result of the Proposed Development.

13.7.13 Embedded mitigation measures would conserve the fabric of Woodbank House with Garden Building preserving its key intrinsic characteristics, whilst also presenting Woodbank House as a landmark feature within the Proposed Development.

13.7.14 The public dissemination of information gathered during HBR and conservation work will also serve to enhance the historical and associative characteristics of the buildings. The results of the EIA, HBR and conservation work will also be used to inform the production of interpretive materials for public dissemination. Such materials could take the form of information panels and/or a heritage trail around the grounds of Woodbank House with Garden Building describing

and illustrating the history of the house and estate, whilst also providing information on the preservation and renovation process.

13.7.15 The beneficial effects of restoration to be identified through a Conservation Management Plan, and public dissemination balances the adverse effects of the Proposed Development upon the setting of Woodbank House with Garden Building and no further mitigation is recommended.

Other Heritage Assets

13.7.16 Adverse operational effects of **minor significance** are predicted on Drumkinnon Bay Winch House including Slipway LB46721, Balloch Castle LB123, Balloch Castle Inventory Garden and Designed Landscape GDL00042, and Balloch Castle earthwork, Loch Lomond Park, SM3385, as well as to historic landscape character in general. No further mitigation is recommended for these heritage assets.

13.8 Residual Effects

13.8.1 Potential effects of the Proposed Development upon the historic environment resulting from its construction and operation are considered below.

Construction Phase

13.8.2 Taking account of proposed mitigation and enhancement measures, the residual potential effects from the construction phase of the Proposed Development are identified in **Table 13-5**.

13.8.3 Residual major beneficial effects are predicted on Woodbank House with Garden Building LB1125, and on its associated stables HA4 with are significant in EIA terms, and a minor beneficial effect is predicted upon possible bothy HA5 which is **not significant**.

Table 13-5: Residual Construction Effects

Heritage Asset	Effect Before Mitigation	Additional Mitigation	Residual Effect	Effect Significance
Woodbank House with Garden Building (LB1125)	**Major Beneficial** assuming preservation/ restoration of building fabric through Conservation Management Plan	Programme of historic building recording	**Major Beneficial**	**Significant**
HA4, stables	**Major Beneficial** assuming preservation /restoration of building fabric through Conservation Management Plan	Programme of historic building recording	**Major Beneficial**	**Significant**
HA5, possible bothy	**Minor Beneficial** assuming preservation/ restoration of building fabric through Conservation Management Plan	Programme of historic building recording	**Minor Beneficial**	**Not significant**
HA1, disused railway line	**Minor Adverse**	Programme of trial trenching to ensure any surviving elements of the asset are recorded prior to construction commencing	**None**	**Not significant**

Heritage Asset	Effect Before Mitigation	Additional Mitigation	Residual Effect	Effect Significance
Previously unrecorded below ground archaeological remains	**Moderate Adverse**	Investigation through trial trenching and additional excavation if required to ensure any surviving elements are recorded	**None**	**Not significant**

Operational Phase

13.8.4 Taking account of proposed mitigation and enhancement measures, the residual potential effects from the operational phase of the Proposed Development are identified in **Table 13-6**.

13.8.5 Residual **minor adverse** effects are predicted on Woodbank House with Garden Building LB1125, and on its associated stables HA4, Loch Lomond, Drumkinnon Bay, Winch House including Slipway, LB46721, Balloch Castle LB123, Balloch Castle Inventory Garden & Designed Landscape, GDL00042, and the historic landscape character of the Site. These effects are **not significant** in EIA terms.

Table 13-6: Residual Operational Effects

Heritage Asset	Effect Before Mitigation	Additional Mitigation	Residual Effect	Effect Significance
Woodbank House with Garden Building (LB1125)	**Moderate Adverse**	Public dissemination of information gathered during HBR and conservation work. Production of interpretive materials (information panels and/or a heritage trail)	**Minor Adverse**	**Not significant**
HA4, stables	**Moderate Adverse**	Public dissemination of information gathered during HBR and conservation work. Production of interpretive materials (information panels and/or a heritage trail)	**Minor Adverse**	**Not significant**
Loch Lomond, Drumkinnon Bay, Winch House including Slipway, LB46721	**Minor Adverse**	None	**Minor Adverse**	**Not significant**
Balloch Castle LB123	**Minor Adverse**	None	**Minor Adverse**	**Not significant**
Balloch Castle Inventory Garden & Designed Landscape, GDL00042	**Minor Adverse**	None	**Minor Adverse**	**Not significant**
Balloch Castle, earthwork, Loch Lomond Park, SM3385	**Minor Adverse**	None	**Minor Adverse**	**Not significant**
Historic Landscape	**Minor Adverse**	None	**Minor Adverse**	**Not significant**

13.9 Monitoring

13.9.1 A Conservation Management Plan will be produced by a suitably experienced historic buildings professional in consultation with HES.

13.9.2 All advance field assessments and construction phase mitigation would be detailed in a Written Scheme of Investigation (WSI) which would be agreed with WoSAS.

13.9.3 It is considered that the restoration of Woodbank House with Garden Building (LB1125), stables (HA4) and possible bothy (HA5) would require ongoing monitoring by HES/WoSAS as appropriate in advance of and during both the construction, and as necessary throughout its operation in terms of an ongoing monitoring and maintenance regime. The extent and nature of monitoring and maintenance would be outlined in the Conservation Management Plan.

13.9.4 Any programme of archaeological works, including historic building recordings, trial trenching and any other archaeological fieldwork, would be monitored as required by WoSAS.

13.10 Cumulative Effects

13.10.1 Cumulative effects can occur when other proposed developments would also be visible in views that are relevant to the setting of a heritage asset. There are no other proposed developments to which these criteria apply, and therefore cumulative effects have been scoped out of this assessment.

13.11 Summary

13.11.1 The Archaeology and Cultural Heritage assessment has considered likely effects of the Proposed Development upon the setting and physical fabric of cultural heritage assets within the Site and likely effects on the settings of certain assets within the wider landscape.

13.11.2 There are four known heritage assets within the Site boundary on which a potential direct impact has been identified as a result of the Proposed Development: LB1125 Category A listed Woodbank House with Garden Building, and non-designated heritage assets HA4 Woodbank House stables, HA5 a possible bothy at the north of the grounds of Woodbank House, and HA1 the disused railway line to the steamer pier north of the Site.

13.11.3 In addition, the Site is considered to be of medium archaeological potential for hitherto unknown archaeological remains. Potential impacts upon unknown archaeological deposits will be addressed through a staged programme of archaeological works, recommended by WoSAS, likely to be undertaken as a post-determination planning condition.

13.11.4 Within the Site, the Category A listed building LB1125 Woodbank House with Garden Building and stables HA4 have been assessed for potential direct and setting effects. Beyond the Site boundary, four further designated heritage assets are assessed for setting effects: LB46721 Drumkinnon Pier, Winch House including Slipway (Category A-listed building), LB123 Balloch Castle, GDL00042 Balloch Castle (Inventory Garden and Designed Landscape), and SM3385 Balloch Castle, earthwork (Scheduled Monument).

13.11.5 Potential changes to views from and towards these assets have been considered and illustrated with visualisations and setting effects were assessed following site visits to each heritage asset.

13.11.6 Embedded mitigation and enhancement measures have been considered, and additional mitigation measures proposed as necessary to minimise the potential impacts of the Proposed Development.

13.11.7 The only identified residual effects that are **significant in EIA terms** are **major beneficial**: for direct impacts upon LB1125 Woodbank House with Garden Building and HA4 Woodbank House stables. **Minor beneficial** residual construction phase direct effects are predicted upon possible bothy HA5, which is **not significant** in EIA terms.

13.11.8 **Minor adverse** residual setting effects are predicted upon six designated heritage assets, and upon the historic landscape character of the Site, which is **not significant** in EIA terms.

13.11.9 Taking into account the implementation of mitigation and enhancement measures, there are no likely adverse direct or setting effects upon the historic environment arising from the Proposed Development which would be considered significant in the context of the EIA Regulations.

13.12 References

Bibliographic References

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13.12.2 Cook, M. 1998, 'Drumkinnon Bay (Bonhill parish), archaeological evaluation' in Discovery and Excavation Scotland 1998.

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13.12.8 New Statistical Accounts 1845, Bonhill, county of Dumbarton, vol.8, 220-228.

13.12.9 Old Statistical Accounts 1792, Bonhill, county of Dumbarton, vol.3, 442-453.

13.12.10 Ordnance Survey Name Book 1860, Dunbartonshire, vol.4.

13.12.11 Suddaby, I. 2013, 'Bonhill, Alexandria Health and Care Centre, Vale of Leven Hospital, Excavation' in Discovery and Excavation Scotland 2013.

13.12.12 Whittow, J.B. 1977, Geology and Scenery in Scotland Penguin.

Historic Maps

- The following pre-Ordnance Survey maps held by the National Library of Scotland were examined.
- Blaeu, J 1654, Levinia Vicecomitatus, [or] The Province of Lennox called the Shyre of Dun-Britton.
- Roy, W 1747-55, Military Survey of Scotland – Highlands.
- Ross, C 1777, A map of the Shire of Dumbarton.
- Ainslie, J 1821, Map of the Southern Part of Scotland.
- Thomson, J 1832, Dumbartonshire.
- Bartholomew, JG 1902, Trossachs, Loch Lomond.

13.12.13 The following Ordnance Survey maps held by the National Library of Scotland were examined:

- 1864 (surveyed 1860) Dumbartonshire, Sheet XVIII, 1: 2,500.
- 1898 (surveyed 1897) Dumbartonshire, Sheet 18.01, 1: 25,000.
- 1898 (surveyed 1897) Dumbartonshire, Sheet 18.05, 1: 25,000.
- 1918 (surveyed 1914) Dumbartonshire, Sheet 14.14, 1: 25,000.
- 1918 (surveyed 1914) Dumbartonshire, Sheet 18.02, 1: 25,000.
- 1938 (surveyed 1936) Dumbartonshire, Sheet 18.02, 1: 25,000.

Aerial Photographs

Sortie	Date	Frame Nos.
AFL2132	10.09.49	SAW026582
ASS/51388	10.06.88	0195
AFL2014	07.10.27	SPW019589
n/a	01.01.39	SPW062643

14 Socio-economics, Tourism, Recreation & Public Access

14.1 Introduction

14.1.1 This Chapter of the ES provides an assessment of the likely significant effects from the Proposed Development on identified socio-economic, tourism, recreation and public access receptors. The assessment is based on the characteristics of the site and surrounding area and the key parameters of the Proposed Development detailed in **Chapter 2 – Site and Surrounding Area** and **Chapter 3 – The Proposed Development** respectively.

14.1.2 This chapter has been prepared by Stantec. In line with best practice, a statement outlining the relevant expertise and qualifications of competent experts appointed to prepare this ES is provided in **Appendix 1.1**

14.1.3 The aims of this chapter are to:

- Identify the relevant context in which the socio-economic, tourism, recreation & public access and assessment has been undertaken;
- Describe the methodology used to undertake the assessment;
- Outline the relevant baseline conditions currently existing at the Site and surrounding area;
- Identify the potential direct and indirect socio-economic effects of the Proposed Development;
- Identify the potential tourism, recreation & public access effects of the Proposed Development;
- Identify mitigation and enhancement measures where required to address identified effects;
- Assess residual predicted effects; and,
- Assess cumulative effects on socio-economics from the Proposed Development.

14.1.4 This chapter is supported by the following figures and technical reports provided in **Appendices 14.1 to 14.3**:

- **Appendix 14.1** – Figures includes:
  - Socio-economic and Labour Market Study Area;
  - Tourism and Recreation Study Area; and,
  - Public Access Study Area.
- **Appendix 14.2** – Detailed Baseline Conditions; and,
- **Appendix 14.3** – Policy Context.

14.1.5 The assessment draws upon relevant conclusions from other technical assessment chapters of this ES, in particular regarding likely 'primary' environmental or physical effects arising from changes in landscape character, visual amenity or the setting of heritage assets which may lead to secondary socio-economic effects on the tourism and recreation sector. This assessment should therefore be read in conjunction with **Chapter 2 – Location and Nature of Development**; **Chapter 11 – Landscape and Visual Impact**; **Chapter 12 – Traffic and Transport**; and **Chapter 13 – Archaeology and Cultural Heritage**.

14.2 Policy Context, Legislation, Guidance and Standards

Legislation

14.2.1 The overarching legislative framework applicable to this EIA for the proposed development is outlined in **Chapter 5 – Legislative and Policy Context**. Over and above this there are no statutory provisions of specific relevance to this assessment.

Policy

14.2.2 The planning policy framework applicable to this EIA for the proposed development is outlined in **Chapter 5 – Legislative and Policy Context**. The statutory Development Plan applicable to the site presently comprises:

14.2.3 Planning policy considerations of specific relevance to this assessment are:

- National Planning Framework 3 (2014);
- Draft National Planning Framework 4 (2021);
- Scottish Planning Policy (2014);
- Loch Lomond and the Trossachs National Park Local Development Plan (2017-2021)27;
- Loch Lomond and the Trossachs National Park Visitor Experience Planning Guidance;
- Loch Lomond and the Trossachs National Park Indicative Regional Spatial Strategy (2020); and,
- Other relevant supplementary guidance.

14.2.4 Other policy considerations of specific relevance to this assessment include:

- Scotland's National Strategy for Economic Transformation (2022);
- Loch Lomond and the Trossachs National Park Tourism Strategy (2012-2017);
- Loch Lomond and the Trossachs National Park Outdoor Recreation Plan (2013-17);
- Loch Lomond and the Trossachs Core Paths Plan 2010-2017; and,
- HM Treasury (2020). Green Book Guide.

Guidance and Relevant Technical Standards

Socio-economics

14.2.5 The assessment presented in this Chapter has adopted a methodology consistent with HM Treasury's Green Book appraisal guidance. The latest update to the Green Book (2022)[28] has been taken account of in the assessment of labour market effects.

14.3 Consultation

EIA Screening and Scoping

14.3.1 An EIA Screening and Scoping Request was lodged with the LLTNPA in June 2021. It outlined the proposed scope of a Socio-economic, Tourism, Recreation and Public Access ES Chapter.

14.3.2 The July 2021 Scoping Response from LLTNPA provided a number of comments from various consultees. Consultation responses pertinent to this ES Chapter were received from:

- Historic Environment Scotland (HES);
- LLTNPA;
- NatureScot (NS); and,
- West Dunbartonshire Council Roads Services.

14.3.3 These responses were collated and reviewed to identify key sensitivities of relevance to this assessment and were accounted for accordingly, including relevant socio-economic, tourism, recreation and public access assets. For full details of scoping comments and responses of relevance to this ES Chapter please see **Appendix 14.2 – Detailed Baseline Conditions**.

[27] The National Park Authority have revised the timeframes for the reparation of the next LDP. The current one will remain in force until 2024. https://www.lochlomond-trossachs.org/wp-content/uploads/2021/09/Development-Plan-Scheme-2021.pdf

[28] HM Treasury (2022). Green Book Guide. Available at: https://www.gov.uk/government/publications/the-green-book-appraisal-and-evaluation-in-central-governent/the-green-book-2020

Post Scoping Consultation

14.3.4 Formal pre-application planning advice was sought from LLTNP in September and December 2021 and February 2022 regarding public rights of way, public access in general, job numbers and the nature of employment opportunities.

14.3.5 As requested in the July 2021 Scoping Response, a meeting was held with the LLTNPA Access Officer on the 20th April 2022 to discuss public access and rights of way with regards to the Proposed Development. Proposals were broadly welcomed, particularly proposals to enhance the existing public access network and ensuring continuity of access/rights of way. The Access Officer committed to engaging with the Project Team to develop an Access Management Plan, as well as related signage (e.g. temporary diversions), for the construction phase of the Proposed Development in due course.

14.3.6 Additional consultation and stakeholder engagement was undertaken with business groups and organisations to support the statutory engagement requirement as part of the planning process as summarised below:

- Dunbartonshire Chamber of Commerce;
- Dunbartonshire Flourishing Delivery and Improvement Group;
- Loch Lomond Shore Proprietors Association;
- Strathleven Regeneration;
- Scottish Enterprise;
- Luss Estates;
- Love Loch Lomond;
- Cruise Loch Lomond;
- Maid of the Loch; and,
- Businesses in Balloch.

14.4 Methodology

Overview

Assessment Scope

14.4.1 The principal aspects considered within this assessment are:

- Direct, indirect and induced employment/labour market effects during the construction and operational phases of the Proposed Development;
- Direct and indirect effects on relevant key business sectors (e.g. construction and tourism and recreation);
- Direct and indirect effects on tourism and catalysed by changes attributable to the construction or operation of the Proposed Development;
- Direct and indirect effects on public access (including any impacts and potential/perceived barriers to key public access routes such as core paths and rights of way as well as any areas that presently provide unhindered movement and informal routes). Effects on public access are further assessed in **Chapter 11 – Landscape and Visual Impact** including:
  - Restrictions during the construction phase;
  - Enhancement during the operational phase; and,
  - Indirect effects resulting from ‘secondary’ changes in social or economic activity catalysed by ‘primary’ changes in environmental or physical conditions attributable to the construction or operation of the Proposed Development (e.g. changes in visual amenity).

14.4.2 The above methodology was informed by a baseline and policy review to identify key receptors for assessment. This is provided in **Appendix 14.2 – Detailed Baseline Conditions** and **Appendix 14.3 – Policy Context**

Study Areas

14.4.3 The following Study Areas (as presented in **Appendix 14.1**) have been adopted, each focused upon the geographical area where socio-economic, tourism, recreation and public access effects are likely to occur, and which have the potential to be significant in the context of the EIA Regulations:

- **Socio-economic and Labour Market Study Area**: Socio-Economic receptors that affect the local and wider labour market will be assessed for three areas surrounding the development, the local area with a 15-minute drive time catchment, the wider area with a 30-minute catchment and the wider region with a 45-minute catchment;
- **Tourism and Recreation Study Area**: Tourism and recreation effects will be assessed within a 5km radius of the site, capturing key tourism and recreational assets and ensuring consistency with the Study Area used in **Chapter 11 – Landscape and Visual Impact**. This Study Area will consider the 'primary' visual and setting effects from the Proposed Development, as reported within **Chapter 11 – Landscape and Visual Impact**, with the potential to generate 'secondary' tourism and recreation effects. This assessment will also capture likely significant effects as reported within **Chapter 11 – Landscape and Visual Impact**; **Chapter 12 – Traffic and Transport**; and **Chapter 13 – Archaeology and Cultural Heritage**; and,
- **Public Access Study Area**: Direct public access effects will be assessed within the boundary of the site and secondary effects resulting from a change to the visual environment will be assessed within a 5km radius of the site, capturing key public access routes and tourist recreational routes. This is consistent with the LVIA chapter and the ZTV analysis (**Chapter 11 – Landscape and Visual Impact**).

Baseline Data Collection

14.4.4 To inform the assessment, a desk-based review of publicly available data was undertaken to establish relevant baseline socio-economic, tourism, recreation and public access conditions at the Site and within each of the identified aforementioned Study Areas.

Socio-economic Indicators

- Current demographic characteristics, including population size and structure;
- Current labour market characteristics, including working age population profile (level of economic activity, occupation and skills profiles) as well as the workplace economy profile (employment by industry and earnings); and,
- Nationally, regionally and locally important tourism and recreation assets.

14.4.5 A detailed overview of the baseline and policy assessment is provided in **Appendix 14.2 – Detailed Baseline Conditions** and **Appendix 14.3 – Policy Context**.

14.4.6 The following statistical sources have also been used to inform the assessment of likely effects:

- Office for National Statistics (ONS);
- Scottish Annual Business Statistics (2019);
- ONS Job Density (2019);
- ONS Population Estimates – local authority based by 5-year age brand (2019);
- ONS Annual Population Survey (2019);
- ONS Business Register and Employment Survey (2019);
- ONS Annual Survey of Hours and Earnings (2020);
- Supply, Use and Analytical Input-Output Tables produced by the Scottish Government (1998 to 2018); and,
- GDP Deflators at Market Prices and Money GDP (2022).

Tourism, Recreation & Access

14.4.7 A desk–based analysis has been carried out to determine key factors which impact upon tourism trends and the key drivers influencing the market. Factors such as visitor patterns and trends, occupancy rates and popular visitor attractions are analysed.

14.4.8 A desk-based audit has also been prepared to determine the scale of tourism and recreational activity and related facilities in the study area. The assessment covers key aspects including: tourism and recreation facilities; and those facilities and features which act as a focus or attraction for visitors, and lead to expenditure by visitors.

14.4.9 The following facilities and attractions have been identified in the study area:

- Indoor and outdoor tourist attractions – including cultural facilities, recreational amenities and leisure facilities;
- Visitor accommodation – including hotels, self-catering, Guest Houses and B&Bs;
- Hospitality establishments – including restaurants and cafes;
- Recreational assets – including Loch Lomond, the River Leven, Balloch Castle and country parks and woodland;
- Visitor activities – including walking, fishing, country pursuits, wildlife interests and sports; and,
- Visitor and tourist routes – including cycling, walking and rights of way.

Modelling

14.4.10 Relevant quantitative data was analysed to predict gross and net socio-economic effects, including demographic changes and employment generation from both the construction and operation of the Proposed Development. This model applied economic multipliers and additionality assumptions as detailed below in the Impact Assessment Methodology.

Approach to Socio-economic Assessment

Consideration of Relevant Receptors

14.4.11 The assessment of receptor sensitivity has been informed by publicly available information sources. At the time of writing, COVID-19 has resulted in changes to socio-economic conditions, however there is no evidence to suggest the long-term implications of such changes. The assessment of receptor sensitivity is therefore informed by a suite of baseline conditions prior to the onset of the COVID-19 pandemic.

14.4.12 From the information sources outlined below, the current baseline conditions of the Site and surrounding area were characterised. This led to the identification of relevant sensitive receptors to consider within the assessment, as detailed within **Appendix 14.2 – Detailed Baseline Conditions**. It is important to note that any potential receptor with no or negligible sensitivity to possible socio-economic change(s) arising from the Proposed Development, has no potential to experience likely significant effects (within the context of the EIA Regulations) and have therefore been excluded from this assessment. This ensures the assessment remains proportionate and focused on reporting likely significant effects.

14.4.13 Best practice principles have been applied to assess the employment and labour market impact of the Proposed Development. An economic impact model, consistent with appraisal guidance, has been used to measure net additional employment and GVA[29][30]. Appropriate economic appraisal guidance and professional judgement has been used to estimate values for:

- **Deadweight**: what would happen in the absence of the Proposed Development;
- **Leakage**: the proportion of employment opportunities accessed by people living outside the Study Area;

[29] GVA has been calculated using ONS Annual Business Survey data for the West Dunbartonshire Council Area.

[30] The economic impact model allows the guidance to be applied to the quantitative elements of the employment impact assessment

- **Displacement**: the proportion of Proposed Development benefit accounted for by a reduction in benefit elsewhere;
- **Substitution**: when a firm substitutes one activity for another to take advantage of public sector assistances; and,
- **Multipliers**: to estimate further economic activity associated with additional income and supplier purchases.

14.4.14 In particular, the above assumptions were used to assess the scale of net additional jobs likely to be generated or supported by the Proposed Development.

Sensitivity

14.4.15 For employment and labour market effects, adequate labour and/or skills capacity results in a low sensitivity, while limited labour and/or skills capacity results in a high sensitivity.

Table 14-1: Sensitivity Criteria

Sensitivity	Example
High	There is a shortfall of appropriate labour and skills. The Proposed Development would therefore lead to labour market pressure and distortions (i.e. skills and capacity shortages, import of labour, wage inflation).
Medium	There is low/limited supply of appropriate labour and skills. The Proposed Development may therefore lead to labour market pressure and distortions.
Low	There is a readily available supply of appropriate labour and skills. The Proposed Development is therefore unlikely to lead to labour market pressure of distortions.

Source: Stantec (2022)

Magnitude of Change

14.4.16 The magnitude of change from the construction and operation of the Proposed Development on identified socio-economic receptors is determined using the criteria outlined in **Table 14-1** below. This assessment has been informed by all publicly available information sources at the time of this assessment. Note the change may be beneficial or adverse in all instances.

Table 14-1: Magnitude of Change Criteria

Magnitude of Change[31]	Criteria
High	Employment changes: the change in the number of jobs in the Study Area would be 250 or greater (based upon the EU definition of small and medium enterprises (European Commission, 2003)). Other socio-economic changes: changes to identified receptors would be observed on an international, national or regional scale. Changes are likely to be experienced over the long term (i.e. 5+ years).
Medium	Employment changes: the change in the number of jobs in the Study Area would be 50 or greater, but fewer than 250. Other socio-economic changes: changes judged to be important at a local scale, to identified receptors. Changes are likely to be experienced over the medium term (i.e. 3-5 years).
Low	Employment changes: the change in the number of jobs in the Study Area would be greater than 10, but fewer than 50. Other socio-economic changes: changes to identified receptors at the local level only. Changes are likely to be experienced over the short term (i.e. 1-2 years).
Negligible	Employment changes: the change in the number of jobs in the Study Area would be less than 10. Other socio-economic changes: changes to identified receptors at the local level only. Changes are likely to be experienced over the short term (i.e. less than 6 months).
No change would be perceptible, either beneficial or adverse.	

[31] It is important to note that the Magnitude of Change can be both beneficial or adverse.

Source: Stantec (2022)

14.4.17 As detailed in **Table 14-1** above, other likely socio-economic (including effects on relevant key business sectors) require to be examined qualitatively on a case-by-case basis:

- In relation to the construction and tourism and recreation (encompassing accommodation and food services) sectors of the economy, the key question which underpinned the assessment was: *"Taking account of any proposed embedded mitigation, what effect would the socio-economic activity or outcome generated by the Proposed Development be likely to have on the performance of the sector within the assessed Study Area?"*;

Approach to Tourism, Recreation and Public Access Assessment

Consideration of Relevant Receptors

14.4.18 The assessment of likely tourism, recreation and public access effects was underpinned by the identification of key components of the tourism and recreation business sector and public access routes with the potential to be affected by the Proposed Development.

14.4.19 Public access receptors of relevance to this assessment will be assessed on an individual basis with varying sensitivity, magnitude of change and significance assigned to each based on their subjective susceptibility to changes resulting from the Proposed Development. This assessment has identified all Core Paths and a range of other promoted recreational routes, including the John Muir Way, within the Public Access Study Area, and with visibility of the Proposed Development. The availability of informal areas of open space has also been recognised in accordance with the scoping opinion.

14.4.20 Notwithstanding the unique characteristics and offering of all individual tourism and recreational assets across the Study Area, receptors of relevance to the tourism and recreation elements of this assessment can be categorised under six broad groupings, each with different sensitivity to changes in visitor attractiveness (as detailed in **Appendix 14.2 – Detailed Baseline Conditions**):

- Outdoor tourist destinations;
- Indoor tourist destinations;
- Hospitality;
- Visitor accommodation;
- Recreational activities in the open countryside; and,
- Tourists travelling (by road) through the open countryside.

Sensitivity

14.4.21 For tourism, recreation and public access effects, receptor sensitivity was determined with reference to the importance of the receptors likely to be affected and the extent to which any change upon these by the Proposed Development could affect their economic performance. The sensitivity of relevant receptors was therefore defined on a case-by-case basis, as detailed in **Appendix 14.2 – Detailed Baseline Conditions**.

Magnitude of Change

14.4.22 The visitor attractiveness and tourism potential of each of the six receptor groupings could be affected by environmental or socio-economic changes (i.e. 'primary effects'), including likely effects from the construction or operation of the Proposed Development as assessed in other technical assessment chapters of this ES. These six receptor groupings have there been considered in the assessment of the Proposed Development. The relevant individual tourism and recreational assets within the Tourism and Recreation Study Area are listed as part of the description of **Detailed Baseline Conditions (Appendix 14.2)**.

14.4.23 In relation to the assessment of 'primary' effects on recreational and public access during both the construction and operation phase of the Proposed Development, the sensitivity of impacted designated walking routes was assigned based on their recognition at the national level (e.g. NPF3) and the level of statutory protection afforded to them (e.g. under the Land Reform (Scotland) Act 2003). Further, the assessment of 'secondary' effects on the identified key components of the tourism and recreation sector was conducted by assigning a sensitivity to

each receptor grouping based on both the importance identified tourism assets within the Tourism and Recreation Study Area and their susceptibility to changes in the visitor attractiveness of such assets and catalysing changes in visitor numbers and tourist expenditure.

14.4.24 In relation to the Tourism and Recreation Study Area, the sensitivity of the key components of the tourism and visitor economy sector is reflected in the extent to which change in the visitor attractiveness of the tourism sector and each of its components is likely to influence change in visitor numbers and expenditure. For individual receptors, sensitivity in socio-economic terms therefore differs from the criteria applied in landscape, visual, cultural heritage and other assessments. Rather, it reflects tourists choosing to visit an area (or not) and how the local/regional sectors may react to a change in visitor numbers/expenditure. The type and level of 'primary' environmental or socio-economic changes generated by the Proposed Development which could catalyse 'secondary' changes in visitor attractiveness and tourism potential (and thus visitor numbers and expenditure) was then examined. In doing so, the key question which underpinned this assessment was: *"Taking account of any proposed embedded mitigation to what extent would the proposed change in tourism, recreation, leisure and accommodation provision be likely to result in a change in the visitor attractiveness and tourism potential of existing tourism and recreation receptors, in terms of visitor numbers and expenditure?"*

14.4.25 In relation to 'primary' effects on the Public Access Study Area, the key question which underpinned this assessment was*: "Taking account of any proposed embedded mitigation, to what extent would the Proposed Development necessitate changes in public access (including informal routes) and/or infringe upon statutory or policy protections afforded to designated routes?"*

Significance of Effects

14.4.26 In line with standard EIA practice, the sensitivity of receptors is considered against the Magnitude of Change to determine the significance of effect (see **Table 14-2** below). Effects which are 'moderate' or 'major' are considered to be significant in EIA terms (highlighted in light grey shading below).

Table 14-2: Significance Matrix of Effects

Sensitivity of Receptor	Magnitude of Change		
	Low	**Medium**	**High**
High	Moderate	Moderate / Major	Major
Medium	Low / Moderate	Moderate	Moderate / Major
Low	Low	Low / Moderate	Moderate
Negligible	Negligible / Low	Low	Low / Moderate

- Source: Stantec (2022)

Approach to Cumulative Impact Assessment

14.4.27 The EIA Regulations require an assessment of the likely significant cumulative effects of the Proposed Development and other approved developments, at construction and operational stages. However, as noted in the Scoping Opinion (Ref PSC/2021/0005) received from the LLTNPA, there are no known significant terrestrial development proposals within the immediate area of the National Park to be considered in this ES Chapter.

Limitations and Assumptions

14.4.28 The following limitations and assumptions have been adopted in this assessment:

COVID-19

14.4.29 The baseline conditions presented within this assessment utilise data collected prior to the global disruption as a result of the ongoing COVID-19 pandemic. At the time of writing this ES Chapter, COVID-19 has resulted in changes to socio-economic conditions, however, there is no evidence to indicate the long-term implications of these changes. The baseline data presented therefore remains representative and appropriate to inform a robust and proportionate assessment of the Proposed Development.

Visitor Economy COVID-19 Implications

14.4.30 Key components of the tourism and recreation sector have different sensitivities to potential impacts from development proposals (i.e. linked to relevant primary environmental effects on individual receptors). It is important to note that sensitivity ratings assigned to the tourism and recreation sector have not been adjusted in response to the ongoing COVID-19 pandemic, as whilst sectoral performance is presently reduced compared with pre-pandemic levels, this does not detract from the continued importance of the sector to local, regional and national economies.

Capital Expenditure

14.4.31 Construction costs for the Proposed Development including associated infrastructure as the access tracks was provided by the client in March 2022 to an estimated value of £40 million.

Gross Employment

14.4.32 In absence of the turnover per worker for the 15, 30 and 45 minute catchment area being available, the West Dunbartonshire figure has been used as a proxy, resulting in the same gross jobs across the 3 aforementioned areas. The net employment calculations have however been adjusted to take account of the additional factors applicable to each of the Study Areas characteristics.

Additionality Assumptions

14.4.33 Further detail relating to the additionality factors adopted within this assessment are outlined under **Section 14.4 - Methodology**.

14.5 Baseline Conditions

14.5.1 This section sets out a series of summaries of the relevant baseline conditions used to inform this socio-economic, tourism, recreation and public access assessment. **Appendix 14.2** presents the detailed baseline conditions which are summarised below.

The Site

14.5.2 The Site lies within Loch Lomond and the Trossachs National Park and comprises two distinct areas; West Riverside, adjacent to the Loch Lomond Shores Development, and the curtilage of Woodbank House, a derelict former hotel with adjacent grounds, situated between Balloch and the A82.

The Surrounding Area

14.5.3 Relevant baseline conditions are presented for the Socio-economic and Labour Market; Tourism and Recreation; and Public Access Study Areas where information is available. Scotland has been used as a comparator where appropriate.

Settlement Profile

14.5.4 LLTNP borders West Dunbartonshire to the south; Argyll and Bute to the north and east; and Stirling to the west. The National Park encompasses around 1,865 sq.km of land and roughly 50% of Scotland's population live within an hour's drive of the park[32]. Despite being situated within the LLTNP local planning authority boundary, the Site also sits within the administrative boundary of West Dunbartonshire Council. The site is located in Balloch.

14.5.5 The Site benefits from strong connectivity with West Dunbartonshire and Glasgow to the south via the A82 and railway line, benefitting the local economy, tourism, recreation and visitor sector.

Socio-economic and Labour Market Baseline

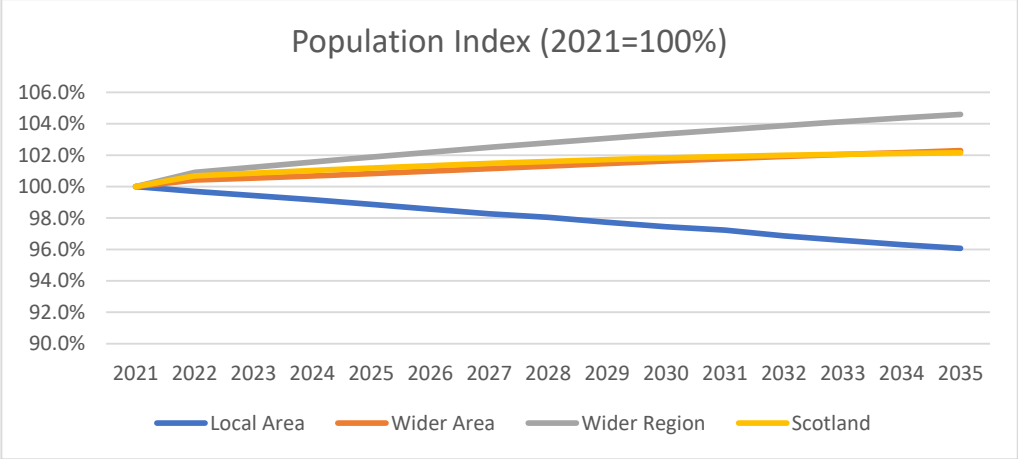
Population

14.5.6 The local area has experienced a population increase between 2001 and 2019 (5%). The populations of the wider area and wider region have also risen (9% and 11% respectively). This increase is similar to that experienced across Scotland (11%). To 2035, the population of the

[32] Loch Lomond and the Trossachs National Park (No Date). Key Facts. Available online at: https://www.lochlomond-trossachs.org/discover-the-park/key-facts/

local area is anticipated to continue to grow, albeit at a slower rate (2%) and the population of the wider area and wider region will increase (7% and 10% respectively).[33]

Figure 14-1: Population Index Anticipated Growth (2021 = 100%)

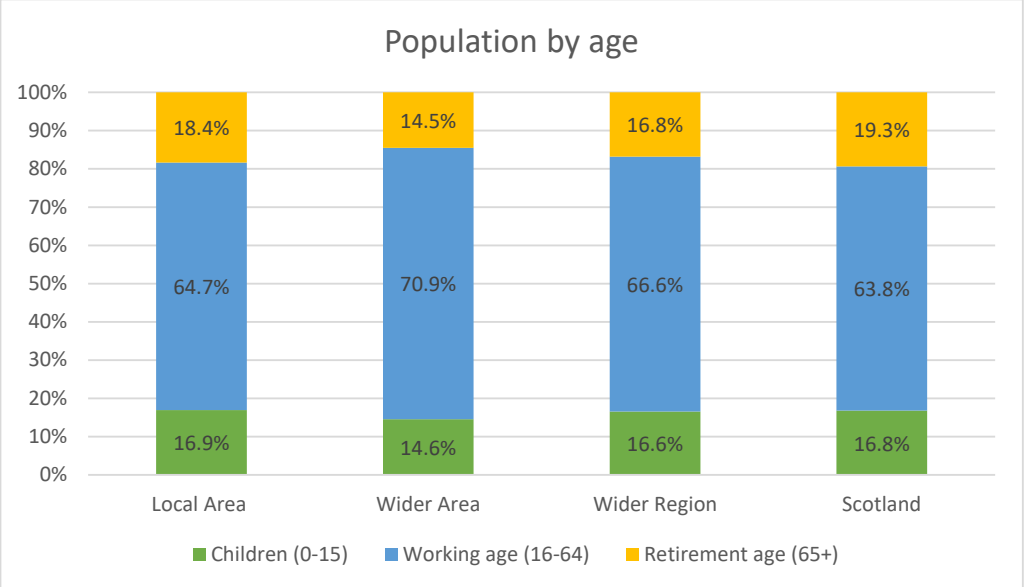


Source: Stantec Calculations Using 2021 Data from ONS 2011 Census.

Age Structure

14.5.7 The age structure in the local area reflects an aging population relative to the wider area, wider region and Scotland. There is a higher proportion of people aged over 65 in the local area when compared with the wider area and region. The proportion of children (aged 0 to 15) is similar to that of the wider region and Scotland.

Figure 14-2: Age Structure



Source: Stantec Calculations using 2021 Data from ONS Census 2011.

14.5.8 The proportion of working age people is declining across the study area and in Scotland. In the local area, the working age population decreased by 3% from 2001 to 2021 and is predicted to decrease a further 8% to 2035. Contraction in the working age population is also expected in the wider area (falling by 9%) while in the wider area there is expected to be a 12.7% increase. A further 12% and 1.2% respectively are predicted for the 2021-2035 period. The local area has

[33] ONS (2022) 2011 Census. Available at: Population and migration - Office for National Statistics (ons.gov.uk)

a declining proportion of working age people and an increasing dependency ratio which is likely to put additional pressure on services in the area. Indeed, to 2035, the retirement age population in the local area is predicted to increase by 35% from 2021. This is above the wider area and wider region (31% and 32% respectively) and slightly above expected growth in Scotland (29%). [34]

Economic Activity

14.5.9 The economic activity rate is a measure of the labour market opportunities available in the area[35]. The local area's level of economic activity (67.7%) is comparable with the wider area, wider region and Scotland (64.3%, 67.1% and 68.1% respectively).

14.5.10 Economic inactivity in the local area (32.3%) is lower than the wider area (35.7%), and comparable with both the wider region (32.9%) and Scotland (31.9%). Of economically active people, the employment profile is similar across the Study Area, with 8% of people self-employed within the local area, 8% in the wider area and 7% in the wider region.

14.5.11 Of economically inactive people, a higher proportion of people in the local area are retired (46%) compared to the wider area (30%), wider region (40%). The proportion of retired people within the local area is comparable with Scotland (also 46%).

Employment Structure

14.5.12 Human health and social work, public administration, defence & compulsory social security and wholesale & retail are the main sources of employment in the local area (comprising 40% of resident employment). This is slightly higher than the wider area and region (36% and 35% respectively) and in Scotland (36%). However, a smaller proportion of residents in the Study Area are employed in wholesale and retail compared to Scotland.

Skills and Qualifications

14.5.13 National Readership Survey (NRS) social grades area system of demographic classification widely used in market research[36]. Compared to the wider area, wider region and Scotland, the local area has a lower proportion of people in the highest social grades (AB). The Study Area generally has a slightly higher proportion of people (32%) in lowest social (DE) compared to the national average (27%).

14.5.14 The local area's educational attainment rate is generally comparable with the wider Study Area (i.e. the wider area and wider region) and Scotland levels, though a higher proportion of people have no qualifications compared to Scotland. Furthermore, a lesser proportion of residents in the local area have Level 4 qualifications or above (22%) compared to the wider area, wider region and Scotland (34%, 32% and 30% respectively).

Key Business Sector: Construction

14.5.15 Across West Dunbartonshire, some 1,200 people were employed in the construction sector in 2019. In 2019, it was estimated that the gross value added (GVA) per construction worker was £47,358 and the gross wage/salary per construction worker was £12,573 within the local authority. There were approximately 304 construction businesses (units) operating throughout West Dunbartonshire in 2019.

Key Business Sector: Tourism Accommodation

14.5.16 Within West Dunbartonshire, some 2,400 people were jointly employed in the Accommodation and Food and Beverage sector[37] in 2019. In the same year, it was estimated that the gross value added (GVA) per tourism and recreation worker was £20,034 and the gross wage/salary per worker was £30,306 within the local authority.

[34] ONS (2022) 2011 Census. Available at: Population and migration - Office for National Statistics (ons.gov.uk)

[35] The economic activity rate measures the percentage of the population, both in employment and unemployed that represents the labour supply regardless of their labour status. The figure represents the degree of success of the area in engaging people in productive activity.

[36] Originally developed by the National Readership Survey (NRS). Now used by many other organisations for wider applications and a standard for market research.

[37] For the purpose of this chapter, the 'tourism and recreation' sector encompasses the accommodation and food services sectors.

Summary

14.5.17 The Socio-economic and Labour Market Study Area[38] surrounding the Site is characterised by:

- An increasing population between 2001 and 2019 and to 2035;
- A comparable proportion of working age residents within the wider area, the wider region and Scotland;
- A comparable economic activity and inactivity rate with Scotland;
- A lower proportion of people in highly skilled jobs locally compared to the wider area, wider region and Scotland and a higher proportion of people in semi-skilled/unskilled jobs compared to the wider area, wider region and Scotland;
- A lower proportion of people with Level 4 qualifications or above compared to the wider area, wider region and Scotland; and,
- A higher proportion of residents have no qualifications compared to Scotland.

Tourism, Recreation and Public Access Baseline

14.5.18 This section sets out a series of summaries of the baseline conditions that have informed the assessment. Please refer to **Appendix 14.2 – Detailed Baseline Conditions** for full details.

Economic Importance of Tourism

14.5.19 At the national level, the tourism sector is recognised by the Scottish Government as an important part of the Scottish economy, supporting a range of business activity and employment opportunities[39]. The importance of tourism is demonstrated in its status as one of the Scottish Government's six Growth Sectors[40].

14.5.20 The latest available figures show that sustainable tourism generated some £4.1 billion GVA in 2018. Of all overnight visits to Scotland in 2019, some 80% were made by UK residents (comprising 14.1 million trips), while the remaining 20% of overnight visits were from international visitors (comprising 3.5 million trips)[41].

14.5.21 Whilst only 20% of trips in 2019 were made by international visitors, expenditure from this market totalled £2.5 billion, or 43% of total overnight spend in Scotland, making 2019 the best year in over a decade in terms of international tourist expenditure for both Scotland and the UK. Of all tourism based businesses in Scotland, hotels and similar accommodation is the largest sector – supporting over 47,000 jobs and generating almost £1.4 billion GVA in 2018.

14.5.22 In 2017, approximately 4.6 million people visited to the national park area (of which 2.1 million were day visitors – generating some £142 million for the economy of the park). Staying visitors account for just over half (53%) of all 'visitor days', which takes into account those visitors who stay at any destination for more than a day. Visitors to the park are vital to local businesses, supporting more than 6,799 Full Time Equivalent (FTE) jobs in 2017.

Characteristics and Assets

Visitor Attractions

14.5.23 The most recent Scotland Visitor Survey[42] carried out by Jump Research in 2015 and 2016 revealed that the main motivation among respondents to visit LLTNP was 'the scenery and landscape' (78%), followed by 'to get away from it all' (48%) and 'holidayed here before and wanted to return' (39%).

[38] Defined as the area with a 15-minute drive time.

[39] Scottish Government (2015). Scotland's Economic Strategy. Available at: https://www.gov.scot/publications/scotlands-economic-strategy/

[40] Scotland's Economic Strategy (2015). Page 42

[41] Visit Scotland (2019). Key Facts on Tourism in Scotland. Available online at: https://www.visitscotland.org/binaries/content/assets/dot-org/pdf/research-papers-2/key-facts-on-tourism-in-scotland-2019.pdf

[42] Visit Scotland (2017). Scotland Visitor Survey 2015 & 2016. Regional Results: Loch Lomond and the Trossachs National Park. Available online at: https://www.visitscotland.org/binaries/content/assets/dot-org/pdf/research-papers/scotland-visitor-survey-loch-lomond-trossachs-national-park-2016.pdf

14.5.24 In terms of activities undertaken by visitors to LLTNP, the majority spent their time sightseeing by car, coach or on foot (69%). Further, 40% of visitors spent their time shopping and around 35% visited a visitor centre.

14.5.25 There are several heritage assets which attract visitors within the Tourism and Recreation Study Area, in particular Balloch Castle. Research indicates that around 43% of visitors to LLTNP visited a historic house, stately home or castle and an estimated 39% visited a country park or garden.

14.5.26 The LLTNP Tourism Strategy (2012-2017) sets out the aspirations for the tourism sector to 2017, aiming to inform the future direction of the tourism sector and the targets/goals it seeks to achieve. The strategy aims to:

> *"To deliver a high quality, authentic experience for visitors with many opportunities to appreciate and enjoy the natural and cultural heritage within an internationally renowned landscape that compares to the best on offer around the world".*

14.5.27 The Tourism Strategy provides the tourism context for the National Park Partnership Plan (2018-2023) and is intrinsically linked to the LLTNP Outdoor Recreation Plan (2013-2017). Both the Tourism Strategy and Outdoor Recreation Plan are yet to be updated.

Designated Walking and Other Recreational Routes

The Tourism and Recreation and Public Access Study Area consisted of a wide range of designated and non-designated/informal routes used by both residents and visitors. The core paths and other promoted recreational routes (including the John Muir Way and Three Lochs Way) within both Study Areas and with visibility of the Proposed Development of relevance to this assessment are listed below:

- John Muir Way;
- Three Lochs Way (Balloch to Helensburgh);
- Loch Lomond Shores Walk (Balloch);
- Core Paths (within the Site boundary and Public Access Study Area);
- Rights of Way: SD28, SD53, SD95 and SD102;
- National Cycle Route 7;
- West Loch Lomond Cycle Route (Regional Route 40); and,
- Other informal routes including but not limited to the River Leven Shoreline, Drumkinnon Bay Beach, Drumkinnon Wood and the Woodland East of Pier Road.

14.5.28 The Tourism and Recreation review takes account of the protections of The Land Reform (Scotland) Act 2003 and Countryside (Scotland) Act 1967.

Indoor Tourist Attractions

14.5.29 Indoor tourist attractions are fewer across the National Park as a result of the focus on the stunning natural scenery and abundance of outdoor pursuits on offer. Identified Indoor tourist destinations within the Tourism and Recreation Study Area are:

- Loch Lomond Shores, and,
- the Sea Life Loch Lomond.

Outdoor Tourist Attractions

14.5.30 Tourist attractions often utilise the scenic and landscape value of the region. The Site benefits from proximity to a number of natural assets which afford a variety of opportunities for outdoor recreational activities including walking, running, cycling and horse riding. Outdoor tourist attractions relevant to this assessment include:

- Loch Lomond Bird of Prey Centre;
- Sweeney's Cruises;
- Maid of the Loch;

- Steam Slipway;
- TreeZone Aerial Adventure Course; and,
- Loch Lomond Seaplanes.

14.5.31 In recent months, the overall attractiveness of outdoor tourist attractions has risen in light of the COVID-19 pandemic. Outdoor attractions have typically been less affected by pandemic related restrictions owing to natural ventilation, resulting in higher visitor numbers.

Hospitality

14.5.32 Hospitality businesses, including those within hotels, are widespread across the Tourism and Recreation Study Area – with many located within Balloch village centre or along the route of the A82. In Balloch, these are mainly located around Lomond Shores and along Balloch Road. Other hospitality businesses are located in small towns and villages throughout the Study Area.

Visitor Accommodation

14.5.33 The economic contribution of the tourism sector is underpinned by visitor accommodation. In 2017, 27% of all visitors to the National Park stayed in the area for one or more nights and those staying in serviced accommodation (including hotels, guest houses, B&Bs and inns) represent the majority of visitors (19%).

14.5.34 On average in 2017 staying visitors spent an estimated £99.76 per day or £309.26 per visit to the National Park. Visitors staying in serviced accommodation typically spent £126.26 per day and £213.81 per visit and visitors staying in non-serviced accommodation (including self-catering properties as well as camping and caravanning accommodation) on average spent £84.22 per day and £555.82 per visit.

Recreational Activities in the Open Countryside

14.5.35 There are many popular recreational activities within the woodlands, forests, countryside and Lochside coastline of the National Park including walking, running, cycling, mountain biking, fishing, canoeing, kayaking and swimming. Of particular importance, Loch Lomond spans an area of 27.5 sq. miles from Balloch in the south to Ardlui in the north and affords opportunities to enjoy the outdoors. Further, local heritage assets such as Balloch Castle and Country Park opportunities to enjoy the cultural heritage of the area, representing locally popular recreational and access routes.

14.5.36 In addition to walking and heritage-based tourism, golf tourism is also important to LLTNP. There are a number of golf clubs in the Tourism and Recreation Study Area including Vale of Leven Gold Club, Carrick Golf Course and “The Wee Demon” Golf course. These golf clubs also play a key role for visitors, providing bars and restaurants before, during and after golf.

Tourists Travelling (By Road) Through the Open Countryside

14.5.37 Travelling to, from or between tourist destinations, recreational activities, hospitality or visitor accommodation itself forms part of the overall tourism experience. Tourists may select accommodation or destinations depending on their accessibility, among many other factors, and any potential disruption to journeys may detract from their enjoyment of the visitor experience. Key routes of note include:

- A82;
- A811;
- Old Luss Road;
- Balloch Road;
- National Cycle Route 7;
- West Loch Lomond Cycle Route (Regional Route 40); and,
- Other minor roads.

14.5.38 Please note a detailed list of all baseline conditions considered for this assessment, including a full list of individual tourism, recreation and public access receptors identified for assessment is provided in **Appendix 14.2 – Detailed Baseline Conditions**.

Summary of Receptor Sensitivity

14.5.39 As discussed in Section 14.4 – Methodology, the visitor attractiveness and tourism potential of each of the tourism and recreation receptor groupings could be affected by environmental or socio-economic changes (i.e. 'primary' effects) including likely effects from both the construction or operation of the Proposed Development (as assessed in other technical assessment chapters of this ES).

14.5.40 For public access effects, the national, regional and local importance of each identified receptor was considered to determine the sensitivity of each to change resulting from the Proposed Development.

14.5.41 For employment effects, the availability of labour and skills is critical in accommodating the demands, need and requirements of the Proposed Development and therefore the sensitivity reflects the available supply of these elements.

14.5.42 **Table 14-3** in **Appendix 14.2 – Detailed Baseline Conditions** identifies the receptors likely to experience socio-economic effects from the Proposed Development and thus requiring to be considered in the impact assessment. A detailed breakdown of the receptors identified for assessment is provided in **Appendix 14.2 – Detailed Baseline Conditions**.

14.5.43 **Table 14-3** below summarises the sensitivity of socio-economic, tourism, recreation and public access receptors likely to experience effects from the Proposed Development and therefore require to be considered within the impact assessment presented within this ES Chapter.

Table 14-3: Summary of Receptor Sensitivity

Receptor	Type of Effect	Sensitivity	Phase of Likely Effect(s)
Labour Market			
Labour Market	Changes in employment	Low	Construction and Operation
Key Business Sectors			
Construction	Changes in sectoral activity and performance	Low	Construction
Tourism and Recreation		Medium	Operation
Public Access			
Principal Walking Routes			
John Muir Way	Availability of access during construction and operation phases	High	Construction and operation
Three Lochs Way		High	Construction and operation
Loch Lomond Shores Walk		Low	Construction and operation
Balloch Castle Country Park		Low	Construction and operation
Rights of Way			
SD28	Availability of access during construction and operation phases	Low	Construction and operation
SD29		Low	Construction and operation
SD30		Low	Construction and operation
SD31		Low	Construction and operation
SD44		Low	Construction and operation
SD45		Low	Construction and operation
SD46		Low	Construction and operation
SD47		Low	Construction and operation
SD53		Low	Construction and operation
SD55		Low	Construction and operation
SD56		Low	Construction and operation
SD57		Low	Construction and operation

Receptor	Type of Effect	Sensitivity	Phase of Likely Effect(s)
SD60		Low	Construction and operation
SD81		Low	Construction and operation
SD82		Low	Construction and operation
SD83		Low	Construction and operation
SD84		Low	Construction and operation
SD97		Low	Construction and operation
SD99		Low	Construction and operation
SD103		Low	Construction and operation
SD58		Low	Construction and operation
SD61		Low	Construction and operation
SD62		Low	Construction and operation
SD102		Low	Construction and operation
SD95 (vindicated vehicular right of way)		Low	Construction and operation
SD109		Low	Construction and operation
SD59 (Other route)		Low	Construction and operation
Heritage Path			
Stoneymollan Road	Availability of access during construction and operation phases	Low	Construction and operation
Core Paths			
Within site boundary	Availability of access during construction and operation phases	Medium	Construction and operation
Outwith site boundary		Medium	Construction and operation
Cycle Paths			
National Cycle Route 7	Availability of access during construction and operation phases	High	Construction and operation
West Loch Lomond Cycle Route (Regional Cycle Route 40)		Medium	Construction and operation
Arden to Helensburgh		Low	Construction and operation
Informal Open Access Site Areas			
Woodbank House Parkland	Availability of access during construction and operation phases	Low	Construction and operation
Drumkinnon Bay Beach		High	Construction and operation
Drumkinnon Bay Beach (North)		Medium	Construction and operation
Drumkinnon Wood		Medium	Construction and operation
Duncan Mills Slipway		Medium	Construction and operation
Woodland East of Pier Road (including Leven Riverside)		Medium	Construction and operation
Tourism, Recreation			
Indoor tourist destinations		Medium	Construction and Operation
Outdoor tourist attractions		Medium	Construction and operation
Hospitality		Medium	Construction and operation

Receptor	Type of Effect	Sensitivity	Phase of Likely Effect(s)
Visitor accommodation		Medium	Construction and operation
Recreational activities in the open countryside		Medium	Construction and operation
Tourists travelling (by road) in the open countryside		Medium	Construction and operation

14.6 Baseline Evolution

14.6.1 It is reasonable to assume that in the absence of the Proposed Development, another tourism and leisure development would come forward on this Site with a similar scale of development. This is because much of the Site is allocated for "Visitor Experience" within the LDP and much of the Site has been marketed for these purposes through Scottish Enterprise for a number of years.

14.7 Embedded Mitigation

14.7.1 As detailed in **Chapter 2 – Location and Nature of the Development**, a number of design features and embedded mitigation measures have been incorporated into the design and construction of the Proposed Development to avoid, prevent or minimise significant adverse environmental effects and to enhance beneficial effects. Embedded mitigation measures of relevance to this assessment are:

Construction Phase

- Access to all key nodes and routes through the Site are to be maintained during the construction phase with localised diversions in place to facilitate construction which may occur on land within the applicant's control. Any impacts on walking and cycling routes during the construction phase will be short term and localised diversions will be put in place;
- Continued provision of access through the Site to existing receptors and land uses;
- Development and implementation of an Access Management Plan (AMP);
- Access to tourist information facility will be maintained whilst building refurbishment takes place; and,
- Employment of locally resident workers and delivery of training (e.g. apprenticeships where possible).

Operational Phase

- Access to all key nodes and routes through the Site will be maintained during operation with the quality of some routes enhanced. Some permanent localised diversions may be required however this will be limited to using to other land within the applicant's control in order to avoid lengthy or circuitous alterations;
- Continued public access to Drumkinnon Bay Beach/Waterfront and other informal routes identified in **Appendix 14.2 – Detailed Baseline Conditions** and continued provision of access through the Site to existing receptors and land uses;
- Development and implementation of an Access Management Plan (AMP) to encourage sustainable travel to/from the Site by visitors and workers;
- Elevated section of monorail to have sufficient clearance above roads and paths to allow for passage underneath;
- Employment of locally resident workers and delivery of training (e.g. apprenticeships where possible); and,
- Employment will pay at least the Scottish Living Wage and membership of the Scottish Business Pledge.

14.8 Assessment of Likely Effects

Socio-economic Effects

14.8.1 This section sets out the potential socio-economic and labour market effects of the Proposed Development during the construction and operation phases. The assessment of the potential effects is based upon the following indictors:

- Construction:
  - Gross Employment Impacts; and,
  - Net Additional Employment Impacts.
- Operation:
  - Gross Employment and GVA Impacts; and,
  - Net Additional Employment Impacts.

14.8.2 The figures quoted below are based on the information available at the time of this assessment.

Construction Phase

Capital Expenditure

14.8.3 The construction of the Proposed Development is expected to require a total capital expenditure of £40 million. This will give rise to employment and associated expenditure in the economy (direct, indirect and induced) as detailed below.

14.8.4 Construction of the Proposed Development is expected to extend across a 6-year programme of works commencing in 2023. Construction will be delivered in phases, with the first phase expected to be complete and operational by the end of 2024.

Gross Construction Employment

14.8.5 Gross construction employment can be estimated by dividing the capital expenditure figure (£40 million) by the average annual turnover required to support an employee in the construction sector.

14.8.6 Analysis of the Annual Business Survey (ONS, 2019) and the Business Register and Employment Survey (ONS, 2019) suggests that a turnover of £100,833.33 per annum is required on average to support a single construction employee in the West Dunbartonshire in 2019 (SABS, 2019).

14.8.7 Applying the GDP price deflator to uprate this to 2021/22 prices suggests that a turnover of £109,162.86 per annum is required on average to support a single construction employee in West Dunbartonshire in 2022.

14.8.8 The construction of the Proposed Development is therefore estimated to support a total 366 gross temporary construction jobs over the 6-year construction programme across the Study Area.

Net Additional Impact

14.8.9 Only a proportion of total construction employment would occur within the Labour Market Study Area due to mobility of labour, competition from externally located construction firms and supply chains. To take account of these factors, the additionality assumptions detailed in **Table 14-4** below have been used to calculate the net construction employment, estimated using the gross construction employment from the Proposed Development.

Table 14-4: Construction Additionality Assumptions

Data	Wider Region	Nationally	Comments
Deadweight	33%	90%	This project is one of the largest proposed construction projects in the study area, though there are a number of regeneration and housing projects in the Clydeplan area with short to medium term development potential, which will create additional jobs in the absence of this development. It is

Data	Wider Region	Nationally	Comments
			therefore assumed that 1 in 3 (33%) jobs would be created in absence of the proposed development.
Leakage	25%	5%	97% of construction workers in Scotland live and work in the same region, meaning that leakage out with Scotland will be negligible. Construction labour in the 60-min study area makes up 54% of Scotland's construction labour. Given that committed projects will take up only a small proportion of available labour in the study area, leakage outside the study area is expected to be low (25%).
Displacement	25%	10%	Displacement is assumed to be relatively low (25%) within the study area. There is sufficient supply of labour within the study area to complete planned and committed development.
Substitution	0%	0%	Assumed no incentives to influence substitution behaviour.
Multiplier	1.32	1.75	Sectoral Type II multipliers from Scottish Government Input-Output Tables have been applied and adjustment in line with the above leakage assumptions.

14.8.10 Using the additionality assumptions from **Table 14-4** shown above, the 366 gross temporary construction jobs created by the Proposed Development are expected to support approximately 182 net temporary construction jobs within the Wider Area and 55 net additional construction-related jobs in Scotland over the 6-year construction period within the assessed Labour Market Study Area.

14.8.11 The net construction employment associated with the Proposed Development would result in a Low magnitude of change on the Labour Market receptor (a Low sensitivity receptor as per **Table 14-3** in **Appendix 14.2** – Detailed Baseline Conditions), resulting in a Short-Term Low Beneficial effect.

Gross Value Added - Construction

14.8.12 GVA represents regional gross value added, which is the value generated by any unit engaged in the production of goods and services, in this case, construction. Gross construction GVA is £3,131,107 (2022 prices), while GVA per employee is calculated at £47,358.00 (2019), fixed at £51,270 (2022 uprate). It is estimated that the proposed development will generate £1,552,495 net construction Gross Value Added impact in the Wider Region and £2,069,993 net construction Gross Value Added impact in Scotland.[43]

Key Business Sector - Construction

14.8.13 The key sector likely to experience socio-economic effects from the Proposed Development during the construction phase is the construction sector.

14.8.14 GVA generated through the construction phase of the Proposed Development will act as a stimulus to the wider construction sector and induce multiplier effects. The creation of 182 net temporary construction jobs within the Wider Study Area is expected to generate some £712,497.02 net Construction GVA over the 6-year construction period.

Local Economic Development

14.8.15 In addition to generating employment, both direct and indirect, and impacting on key business sectors, the location, scale and nature of the Proposed Development means there is also the potential for wider economic development effects across the local area.

14.8.16 The Applicant shall encourage local Contractors to tender for construction work associated with the proposed development where possible, to ensure that the local business community gain the maximum benefits. The Applicant is committed to holding 'Meet the Developer' sessions to brief local businesses on the types of contracts being let during the construction phase and assist local business to take advantage of potential contracting opportunities. Opportunities for local businesses for construction of the development will include a variety of construction requirements from concrete production to safety, environmental legal and professional

[43] Scottish Annual Business Statistics 2019 (2022). Available at: https://www.gov.scot/publications/scottish-annual-business-statistics-2019/

consultancy services. 35 This is likely to have a positive effect on the number of construction personnel coming from within the Wider Region, though high levels of connectivity to the Central Belt will likely lead to contracts being awarded to firms out with the Wider Region

Operational Phase

Labour Market Effects

Gross Employment

14.8.17 The Proposed Development will lead to significant employment in the Accommodation and food & beverage services industries. The Applicant notes that a total of 80 full time staff and 120 part-time or seasonal staff would be required annually to support the operation of the Proposed Development. Based on assumed ratio of part-time/seasonal staff to FTEs of 0.66, a total of 159 gross FTEs would be required annually to support the operation of the Proposed Development.

Net Additional Employment

14.8.18 The operational phase of the proposed development is predicted to support 31 net additional operational jobs in the Wider Region and 24 net additional operational jobs Nationally.

Table 14-5: Operation Additionality Assumptions

Data	Wider Region	Nationally	Comments
Deadweight	75%	90%	Continued development of the Accommodation and Food sector in Glasgow and the expansion of hospitality industry suggests that a significant proportion of the jobs (75%) would be created in any case if the development were not to happen.
Leakage	10%	0%	Travel to work data from the 2011 Census shows that the majority of workers in West Dunbartonshire live in Glasgow City, East Dunbartonshire, Argyll and Bute and West Dunbartonshire. These are within the Wider Region, though a small proportion of workers also travel from South Lanarkshire and elsewhere, making up about 10% of the workforce. Given that most operational jobs will earn lower wages, investment in longer distance travel (i.e., out with the Wider Region) is expected to be limited.
Displacement	25%	5%	Displacement is assumed to be low (25%) within the study area. The Proposed Development is not expected to take considerable market share, labour, land or capital from other existing local firms or organisations.
Substitution	0%	0%	Assumed no incentives to influence substitution behaviour.
Multiplier	0.93	1.24	Type II operational employment multipliers published by the Scottish Government. Around 75% of the goods and services and household expenditure are assumed to occur in the study area.

14.8.19 Gross Value Added (GVA) is a measure of the value of goods and services produced in an area. The GVA per head in the 'Leisure' industry in West Dunbartonshire is £17,053.22, compared to £22,381 in Scotland. It is estimated that the proposed development will create £534,373 net additional Gross Value Added impact in the Wider Region and £401,109 net additional Gross Value Added impact in Scotland.

14.8.20 The operation of the Proposed Development would result in a medium magnitude of change on the Key Business Sectors of Accommodation, Food & Beverage services and Retail Trade (a Medium sensitivity receptors as per **Table 14-3** in **Appendix 14.2** – Detailed Baseline Conditions), resulting in a Permanent Moderate Beneficial effect.

Key Business Sector: Tourism Accommodation Recreation

14.8.21 Long term the proposed development will affect the tourism and recreation sector mostly, creating 31 additional jobs in the Wider Area and 24 additional jobs in Scotland.

14.8.22 The local economy will receive an additional £534,372 of net operational GVA, while an additional £401,109 operational GVA will be contributed across Scotland.

Local Economic Development

14.8.23 By working with the local community (e.g., Community Council and/or Area Partnership), there is significant potential for the Proposed Development to further benefit the local economy. A number of discussions have been held with relevant local and community stakeholders with regards to the Proposed Development, although any final outcomes remain subject to further discussion.

Assessment of Tourism, Recreation and Public Access Effects

Construction Phase

14.8.24 In accordance with the methodology detailed above, **Table 14-6 and**

14.8.25

14.8.26

14.8.27 Table 14-7 below provide a proportionate assessment of likely construction phase effects on each of the assessed public access receptors and receptor groupings pertaining to tourism and recreation from the Proposed Development. This assessment considers the likely 'secondary' effects on the topic as a whole, rather than assessing 'primary' effects on individual tourism assets. The assessment makes reference to individual identified receptors and associated likely primary environmental effects where relevant, but it applies equally to other receptors of the same grouping. The assessment takes account of likely effects associated with the construction phase.

Table 14-6: Assessment of Construction Phase Effects Public Access

Receptor	Sensitivity	Magnitude of Change	Assessment Rationale	Significance of Effect
Principal Walking Routes / Long Distance Paths				
John Muir Way	High	Medium	Direct impact along the very small proportion of the overall route which enters the Site boundary. Route will be enhanced and access through the Site will be maintained via temporary localised diversions during the construction period. As detailed within the **Section 14.7 – Embedded Mitigation**, an AMP will ensure continuity of access is maintained in the form of temporary localised diversions during the construction phase. Whilst temporary and intermittent, this change will not inhibit access or greatly alter the recreational or experiential value of these routes. Secondary Effects: ▪ The Proposed Development and related construction activity will be visible for a very small proportion of the overall route.	Moderate (Localised Significant)
Three Lochs Way	High	Medium	Direct impact along the small proportion of the overall route which enters the Site boundary. Route will be enhanced and access through the Site will be maintained via temporary localised diversions during the construction period. As detailed within **Section 14.7 – Embedded Mitigation**, an AMP will ensure continuity of access is maintained in the form of temporary localised diversions during the construction phase. Whilst temporary and intermittent, this change will	Moderate (Localised Significant)

Receptor	Sensitivity	Magnitude of Change	Assessment Rationale	Significance of Effect
			not inhibit access or greatly alter the recreational or experiential value of these routes. Secondary Effects: ▪ The Proposed Development and related construction activity will be visible for a small proportion of the overall route (in particular Landscape Character Type 255: View North East from Three Lochs Way near Ben Bowie as identified in **Chapter 11 – Landscape and Visual Impact**). ▪ The Proposed Development and related construction activity will be visible for a large proportion of the route.	
Loch Lomond Shores Walk	Low	Medium	No Direct Impact (Route unchanged). Secondary Effects: ▪ The Proposed Development and related construction activity will be visible for a large proportion of the route.	Low / Moderate
Balloch Castle Country Park	Low	Medium	No Direct impacts (Route unchanged). The Proposed Development and related construction activity will be visible for a large proportion of the identified receptor.	Low / Moderate
Rights of Way				
SD28 SD29 SD30 SD31 SD 44 SD45 SD46 SD47 SD 53 SD55 SD56 SD57 SD60 SD81 SD82 SD83 SD84 SD 97 SD 99 SD103	Low	Low	No Direct Impact (Route unchanged). Secondary Effects: ▪ No identified visibility of the Proposed Development or related construction activity (outside ZTV).	Low
SD58 SD61 SD62 SD 102	Low	Medium	No Direct Impact (Route unchanged). Secondary Effects: ▪ The Proposed Development and related construction activity will be visible from a large proportion of the route.	Low / Moderate
SD 95 (vindicated vehicular right of way)	Low	Low	No Direct Impact (Route unchanged). Route potentially enters the Site however there will be no physical disturbance or severance as a result of construction activity. Secondary Effects: ▪ No identified visibility of the Proposed Development and related construction activity.	Low
SD109	Low	Low	No Direct Impact (Route unchanged). Secondary Effects: ▪ The Proposed Development and related construction activity will be visible from a large proportion of the route.	Low

Receptor	Sensitivity	Magnitude of Change	Assessment Rationale	Significance of Effect
SD59 (Other route)	Low	Medium	No Direct Impact (Route unchanged). Secondary Effects: ▪ The Proposed Development and related construction activity will be visible from a large proportion of the route however this will likely be screened by existing woodland.	Low / Moderate
Heritage Path				
Stoneymollan Road	Low	Medium	No Direct Impact (Route Unchanged). Secondary Effects: ▪ Construction will be highly visible from a large proportion of Stoneymollan Road (in particular Landscape Character Type 261: View North East from Three Lochs Way Near Upper Stoneymollan as identified in **Chapter 11 – Landscape and Visual Impact**).	Low / Moderate
Core Paths				
Within site boundary	Medium	Medium	Direct impact managed and maintained through the site via temporary localised diversions during the construction period. Managed via Access Management Plan As detailed within the **Section 14.7 – Embedded Mitigation**, an AMP will ensure continuity of access is maintained in the form of temporary localised diversions during the construction phase. Whilst temporary and intermittent, this change will not inhibit access or greatly alter the recreational or experiential value of these routes. Secondary Effects: ▪ The Proposed Development and related construction activity will be visible from core paths within the Site boundary.	Moderate (Localised Significant)
Outwith site boundary	Medium	Low	No Direct Impact (Routes unchanged). Secondary Effects: ▪ The Proposed Development and related construction activity may be visible from some core paths outwith the Site boundary.	Low / Moderate
Cycle Paths				
National Cycle Route 7	High	Low	No Direct Impact (Routes unchanged). Secondary Effects: ▪ Limited visibility of parts of the Proposed Development and related construction activity from a very small proportion of the overall route linking Sunderland and Inverness (601 miles).	Moderate (Localised Significant)
West Loch Lomond Cycle Route (Regional Cycle Route 40)	Medium	Medium	No Direct Impact (Routes unchanged). Secondary Effects:	Moderate (Localised Significant)

Receptor	Sensitivity	Magnitude of Change	Assessment Rationale	Significance of Effect
			▪ Visibility of the Proposed Development and related construction activity from a small proportion of the overall route linking Balloch and Tarbet (17 miles).	
Arden to Helensburgh	Low	Low	No Direct Impact (Route unchanged). Secondary Effects: ▪ The Proposed Development and related construction activity will be visible from a large proportion of the route.	Low
Informal Open Access Site Areas				
Woodbank House Parkland	Low	High	Direct impact as a result of buildings being constructed in an area currently free from buildings. High magnitude of direct change likely to be beneficial in discouraging antisocial behaviour whilst areas of the land remain available for dog walkers. As detailed within the **Section 14.7 – Embedded Mitigation**, an AMP will ensure continuity of access is maintained in the form of temporary localised diversions during the construction phase. Whilst temporary and intermittent, this change will not inhibit access or greatly alter the recreational or experiential value of these routes. Secondary Effects: ▪ The Proposed Development and related construction activity will be visible from the parkland around Woodbank House and the visual setting will be changed as a result of buildings being constructed in this area.	Moderate Beneficial (Localised Significant)
Drumkinnon Bay Beach	High	Low	Beach remains open and accessible during the construction phase. As detailed within the **Section 14.7 – Embedded Mitigation**, an AMP will ensure continuity of access is maintained, whilst temporary and intermittent, construction activities will not inhibit access or greatly alter the recreational or experiential value of this area. Secondary Effects: ▪ The Proposed Development and related construction activity will be visible from the beach, however beach is urbanised, human-made and set within context of existing buildings. The visual setting and context will not be materially altered.	Moderate (Localised Significant)
Drumkinnon Bay Beach (North)	Medium	Medium	Beach remains open and accessible during construction and operation phases. As detailed within the **Section 14.7 – Embedded Mitigation**, an AMP will ensure continuity of access is maintained, whilst temporary and intermittent, construction activities will not inhibit access or greatly alter the recreational or experiential value of this area. Secondary Effects: ▪ The Proposed Development and related construction activity will be visible from the beach, however beach is urbanised, human-made and set within	Moderate (Localised Significant)

Receptor	Sensitivity	Magnitude of Change	Assessment Rationale	Significance of Effect
			context of existing buildings. The visual setting and context will not be materially altered.	
Drumkinnon Wood	Medium	Low / Negligible	Drumkinnon Wood remains open and accessible during the construction phase. No construction activities will take place within the wood. As detailed within the **Section 14.7 – Embedded Mitigation**, an AMP will ensure continuity of access is maintained, whilst temporary and intermittent, construction activities on adjoining land will not inhibit access or greatly alter the recreational or experiential value of this area. Secondary Effects: ▪ The Proposed Development and related construction activity will be visible from within the woodland, however it will be relatively screened by surrounding trees. Therefore, the visual setting and context will not be materially altered.	Low
Duncan Mills Memorial Slipway	Medium	Medium	Slipway remains open and accessible during the construction phase. As detailed within the **Section 14.7 – Embedded Mitigation**, an AMP will ensure continuity of access is maintained, whilst temporary and intermittent, construction activities will not inhibit access or greatly alter the recreational or experiential value of this area. Secondary Effects: ▪ The Proposed Development and related construction activity will be visible from the slipway, however the slipway and surrounding Drumkinnon Bay is urbanised, human-made and set within context of existing buildings. The visual setting and context will not be materially altered.	Moderate (Localised Significant)
Woodland East of Pier Road (including Leven Riverside)	Medium	High	Direct impacts will be experiences as a result of buildings being constructed in this area and open access being changed to structured access via pathways. Access however will be maintained and designed into the development as set out in the Design & Access Statement. Temporary localised diversions will occur during the construction period. As detailed within the **Section 14.7 – Embedded Mitigation**, an AMP will ensure continuity of access is maintained in the form of temporary localised diversions during the construction phase. Whilst temporary and intermittent, this change will not inhibit access or greatly alter the recreational or experiential value of these routes. Secondary Effects: ▪ The Proposed Development and related construction activity will be visible from the woodland and Leven Riverside and the visual setting will be changed as a result of buildings being constructed in an area which currently has limited visibility of buildings due to tree cover.	Moderate (Locally Significant)

Table 14-7: Assessment of Construction Phase Effects on Tourism and Recreation

Receptor Grouping	Sensitivity	Magnitude of Change – Visitor Attractiveness and Tourism Potential	Assessment Rationale	Significance of Effect
Indoor Tourist Attractions	Low	Low	**Primary Environmental Effects on Tourism Assets:** ▪ No likely significant adverse effects predicted. **Secondary Environmental Effects on Visitor Attractiveness and Tourism Experience:** ▪ **Table 14-3** presented in **Appendix 14.2** provides a list of tourism assets within this receptor grouping. Two indoor tourist destinations (namely Lomond Shores and Sea Life Loch Lomond) have been identified within the Study Area however irrespective of temporary changes in visual amenity, the destinations will continue to provide the same tourism offering; ▪ As detailed in **Chapter 11 – Landscape and Visual**, the construction works will be perceived from a number of locations, including those noted above. The changes would result in a change in terms of the perceptual experience within the Proposed Development area, however, this is temporary in nature; ▪ As detailed within **Section 1.7 – Embedded Mitigation**, an AMP will ensure continuity of access is maintained to and from Indoor Tourist Attractions, thereby not altering the experiential value or tourism potential of these destinations; and, ▪ On this basis, the construction phase is considered likely to result in a temporary **Temporary Medium Magnitude of Change** to visitor attractiveness and tourism potential of Indoor Tourist Attractions. Having regard to the low sensitivity of this receptor grouping, the construction of the Proposed Development is likely to result in a **Low / Moderate Effect (Not Significant)**.	Low / Moderate Effect (Not Significant)
Outdoor Tourist Attractions	Medium	Medium	**Primary Environmental Effects on Tourism Assets:** ▪ No likely significant adverse effects predicted.	Moderate Effect (Localised significant)

Receptor Grouping	Sensitivity	Magnitude of Change – Visitor Attractiveness and Tourism Potential	Assessment Rationale	Significance of Effect
			Secondary Environmental Effects on Visitor Attractiveness and Tourism Experience: ■ **Table 14-3** presented in **Appendix 14.2** provides a detailed list of tourism assets within this receptor grouping. Ten outdoor tourist destinations have been identified within the Study Area, however irrespective of temporary changes in visual amenity, the destinations will continue to provide the same tourism offering, potentially enhanced by the wider visitor offer afforded by the Proposed Development; ■ As detailed in **Chapter 11 – Landscape and Visual**, the construction works will be perceived from a number of locations. The changes would result in a change in terms of the perceptual experience within the Proposed Development area, however, this is temporary in nature; ■ As detailed within **Section 1.7 – Embedded Mitigation**, an AMP will ensure continuity of access is maintained to and from Outdoor Tourist Attractions, thereby not altering the experiential value or tourism potential of these destinations. Where it is not possible to maintain existing access during the temporary construction phase, localised diversions will be implemented where appropriate; and, ■ On this basis, the construction phase is considered likely to result in a temporary **Medium Magnitude of Change** to visitor attractiveness and tourism potential of Outdoor Tourist Attractions. Having regard to the medium sensitivity of this receptor grouping, the construction of the Proposed Development is likely to result in a **Moderate Effect (Localised Significant)**.	
Hospitality	Medium	Low	**Primary Environmental Effects on Tourism Assets:** ■ No likely significant adverse effects predicted. **Secondary Environmental Effects on Visitor Attractiveness and Tourism Experience:** ■ **Table 14-3** presented in **Appendix 14.2** provides a detailed list of receptors/assets within this receptor grouping. Indirect local benefits will arise from the construction phase, including the potential use of hospitality services by the construction workforce; ■ No change is anticipated to effect hospitality businesses during the construction phase, as the primary draw and general functionality of such establishments will not be impeded by the Proposed Development. Any temporary decline in tourist trade during the construction phase is likely to be offset by increased passing trade from construction workers; and, ■ On this basis, the construction phase is considered likely to result in a **temporary Low Magnitude of** Change, resulting in a **Low / Moderate Effect (Not Significant)**.	Low / Negligible Effect (Not Significant)

Receptor Grouping	Sensitivity	Magnitude of Change – Visitor Attractiveness and Tourism Potential	Assessment Rationale	Significance of Effect
Visitor Accommodation	Medium	Low	**Primary Environmental Effects on Tourism Assets:** ▪ No likely significant adverse effects predicted. **Secondary Environmental Effects on Visitor Attractiveness and Tourism Experience:** ▪ **Table 14-3** presented in **Appendix 14.2** provides a detailed list of receptors/assets within this receptor grouping. Construction of the Proposed Development will not directly impact on any of the visitor accommodation receptors identified. Temporary changes in visual amenity are unlikely alone to have a significant impact on the functioning of relevant visitor accommodation businesses; ▪ Indirect local benefits may arise from the construction phase, including the use of hotels, B&Bs and other accommodation by the construction workforce; and, ▪ On this basis, the construction phase is considered likely to have a temporary **Medium Magnitude of Change** on this receptor grouping therefore resulting in **a Low / Moderate Effect (Not Significant)**.	Low / Negligible Effect (Not Significant)
Recreational Activities in the Open Countryside	Medium	Medium	**Primary Environmental Effects on Tourism Assets:** ▪ View within Loch Lomond and the Trossachs National Park including the Loch, Inchmurrin Island and Ben Lomond; ▪ CT 263: View from Loch Lomond Shores; ▪ LCT 264: Looking towards Inchmurrin Island from Loch Lomond Near Cameron House; ▪ LCT 261: View North East from Three Lochs Way Near Upper Stoneymollan; ▪ LCT 255: View North East from Three Lochs Way near Ben Bowie; ▪ River Leven Corridor Local Nature Conservation Site (LNCS); and, ▪ Drumkinnon Wood Ancient Woodland. **Secondary Environmental Effects on Visitor Attractiveness and Tourism Experience:** ▪ **Table 14-3** presented in **Appendix 14.2** provides a detailed list of receptors/assets within this receptor grouping. Irrespective of likely temporary changes in visual amenity (see **Chapter 11 – Landscape and Visual Impact**), land out with the Site will continue to remain available for recreational use; ▪ **Chapter 5 – Ecology** notes that there is likely to be temporary local adverse impacts on two ecological designated sites with some degree of recreational value within the Tourism and Recreation Study Area, namely the River Leven LNCS and Drumkinnon Wood Ancient Woodland. Potential impacts identified which may also have an effect on the visitor	Moderate Effect (Localised significant)

Receptor Grouping	Sensitivity	Magnitude of Change – Visitor Attractiveness and Tourism Potential	Assessment Rationale	Significance of Effect
			attractiveness of these receptors include pollution and noise disturbance from the construction of buildings and infrastructure; ▪ As detailed within **Section 1.7 – Embedded Mitigation**, an AMP will ensure continuity of access is maintained to and from Recreational Activities in the Open Countryside, thereby not altering the experiential value or tourism potential of these destinations. Where it is not possible to maintain existing access during the temporary construction phase, localised diversions will be implemented where appropriate; and, ▪ On this basis, the construction phase is considered likely to have a temporary **Medium Magnitude of Change** on this receptor grouping therefore resulting in **a Low / Moderate Effect (Not Significant)**.	
Tourists travelling (by road) through the open countryside	Medium	Low	**Primary Environmental Effects on Tourism Assets:** ▪ A82; ▪ A811; ▪ Old Luss Road; ▪ Balloch Road; and, ▪ Other minor roads. **Secondary Environmental Effects on Visitor Attractiveness and Tourism Experience:** ▪ **Table 14-3** presented in **Appendix 14.2** provides a detailed list of receptors/assets within this receptor grouping; ▪ **Chapter 6 – Landscape and Visual Impact** notes that there will be no significant visual effects arising from the construction of the Proposed Development on the adjacent road network (namely the A82 and Old Luss Road) as a result of existing screening by the local landform, woodland and trees. Overall, visual effects on the identified roads are however not significant in EIA terms. An assessment of impacts on the experience of tourists travelling through the open countryside must firstly take account of the fact that the primary focus of drivers would be on the road rather than the surrounding area and associated landscapes; ▪ Taking the above factors into consideration, it is deemed that whilst the visibility of construction activities could momentarily affect the experience of tourists travelling in the open countryside, this would be insufficient to materially affect the overall tourism experience and thus the attractiveness of the area as a tourist destination; and, ▪ On this basis, the construction phase is considered likely to have a temporary **Medium Magnitude of Change** on this receptor grouping therefore resulting in a **Low / Moderate Magnitude of Change (Not Significant)**.	Low / Negligible Effect (Not Significant)

Summary of Construction Phase Effect on Tourism, Recreation and Public Access

14.8.28 **Table 14-8** below provides a summary of the assessed construction phase effects on each of the identified public access receptors and the visitor attractiveness and tourism potential of each key tourism and recreation receptor grouping. The tourism and recreation assessment has been undertaken on a sectoral basis across the Tourism and Recreation Study Area (i.e. the identified six components of tourism and recreation) rather than focusing on individual tourism assets.

Table 14-8: Construction Phase Summary – Tourism, Recreation and Public Access

Receptor	Significance of Effect
Public Access	
Principal Waling Routes/ Long Distance Paths	
John Muir Way	Moderate (Localised Significant)
Three Lochs Way	Moderate (Localised Significant)
Loch Lomond Shores Walk	Low / Moderate
Balloch Castle Country Park	Low / Moderate
Rights of Way	
SD28 SD29 SD30 SD31 SD 44 SD45 SD46 SD47 SD 53 SD55 SD56 SD57 SD60 SD81 SD82 SD83 SD84 SD 97 SD 99 SD103	Low
SD58 SD61 SD62 SD 102	Low / Moderate
SD 95 (vindicated vehicular right of way)	Low
SD109	Low
SD59 (Other route)	Low / Moderate
Heritage Path	
Stoneymollan Road	Low / Moderate
Core Paths	
Within site boundary	Moderate (Localised Significant)
Outwith site boundary	Low / Moderate
Cycle Paths	
National Cycle Route 7	Moderate (Localised Significant)
West Loch Lomond Cycle Route (Regional Cycle Route 40)	Moderate (Localised Significant)
Arden to Helensburgh	Low
Informa; Open Access Site Areas	
Woodbank House Parkland	Moderate Beneficial (Localised Significant)
Drumkinnon Bay Beach	Moderate (Localised Significant)
Drumkinnon Bay Beach (North)	Moderate (Localised Significant)
Drumkinnon Wood	Low
Duncan Mills Memorial Slipway	Moderate (Localised Significant)
Woodland East of Pier Road (including Leven Riverside)	Moderate (Locally Significant)
Tourism and Recreation	
Indoor Tourist Attractions	Low / Moderate Effect (Not Significant)
Outdoor Tourist Attractions	Moderate Effect (Localised Significant)

Receptor	Significance of Effect
Hospitality	Low / Negligible Effect (Not Significant)
Visitor Accommodation	Low / Negligible Effect (Not Significant)
Recreational Activities in the Open Countryside	Moderate Effect (Localised significant)
Tourists travelling (by road) through the open countryside	Low / Negligible Effect (Not Significant)

Operation Phase

14.8.29 **Table 14-9** below provides a proportionate assessment of likely effects on each of the public access receptors and tourism and recreation receptor groupings during the operational phase of the Proposed Development. This assessment considers likely 'secondary' effects on the topic as a whole, rather than assessing 'primary' effects on individual tourism, recreation and public access assets. the assessment makes reference to individual identified receptors and associated likely primary environmental effects where possible, but it applies equally to other receptors of the same grouping.

Table 14-9: Assessment of Operational Phase Effects on Public Access

Receptor	Sensitivity	Magnitude of Change	Assessment Rationale	Significance of Effect
Principal Walking Routes				
John Muir Way	High	Medium	Direct impact along the very small proportion of the overall route which enters the Site boundary. Route will be enhanced and access through the Site will be maintained during the operation phase. This change will not inhibit access or greatly alter the recreational or experiential value of these routes. Secondary Effects: ▪ The Proposed Development and related construction activity will be visible for a very small proportion of the overall route.	Moderate (Localised Significant)
Three Lochs Way	High	Medium	Direct impact along the small proportion of the overall route which enters the Site boundary. Route will be enhanced and access through the Site will be maintained via temporary localised diversions during the construction period. This change will not inhibit access or greatly alter the recreational or experiential value of these routes. Secondary Effects: ▪ The Proposed Development will be visible for a small proportion of the overall route (in particular Landscape Character Type 255: View North East from Three Lochs Way near Ben Bowie as identified in **Chapter 11 – Landscape and Visual Impact**).	Moderate (Localised Significant)
Loch Lomond Shores Walk	Low	Medium	No Direct Impact (Route unchanged). Secondary Effects: ▪ The Proposed Development will be visible for a large proportion of the route.	Low / Moderate
Balloch Castle Country Park	Low	Medium	No Direct impacts (Route unchanged). The Proposed Development will be visible for a large proportion of the identified receptor.	Low / Moderate
Rights of Way				
SD28 SD29 SD30 SD31 SD 44 SD45 SD46 SD47 SD 53 SD55 SD56 SD57 SD60 SD81 SD82	Low	Low	No Direct Impact (Route unchanged). Secondary Effects:	Low

Receptor	Sensitivity	Magnitude of Change	Assessment Rationale	Significance of Effect
SD83 SD84 SD 95 (vindicated vehicular right of way)			▪ No identified visibility of the Proposed Development.	
SD58 SD61 SD62	Low	Medium	No Direct Impact (Route unchanged). Secondary Effects: ▪ The Proposed Development will be visible from a large proportion of the route.	Low / Moderate
SD 97 SD 99 SD 102 SD103 SD109	Low	Low	No Direct Impact (Route unchanged). Secondary Effect: ▪ The Proposed Development will be visible from a large proportion of the route.	Low
SD59 (Other route)	Low	Medium	No Direct Impact (Route unchanged). Secondary Effect: ▪ The Proposed Development will be visible from a large proportion of the route however this will likely be screened by existing woodland.	Low / Moderate
Heritage Path				
Stoneymollan Road	Low	Medium	No Direct Impact (Route Unchanged). Secondary Effects: ▪ The Proposed Development will be highly visible from Stoneymollan Road (in particular Landscape Character Type 261: View North East from Three Lochs Way Near Upper Stoneymollan as identified in **Chapter 11 – Landscape and Visual Impact**).	Low / Moderate
Core Path				
Within site boundary	Medium	Medium	Direct impact on routes. Routes will be enhanced as a result of the Proposed Development, greatly improving access and the recreational and experiential value of these routes. Secondary Effects: ▪ The Proposed Development will be visible from core paths within the Site boundary.	Moderate (Localised Significant)
Outwith site boundary	Medium	Low	No Direct Impact (Routes unchanged). Secondary Effects: ▪ The Proposed Development may be visible from some core paths outwith the Site boundary.	Low / Moderate
Cycle Paths				
National Cycle Route 7	High	Low	No Direct Impact (Routes unchanged). Secondary Effects:	Moderate (Localised Significant)

Receptor	Sensitivity	Magnitude of Change	Assessment Rationale	Significance of Effect
			▪ Limited visibility of parts of the Proposed Development from a very small proportion of the overall route linking Sunderland and Inverness (601 miles).	
West Loch Lomond Cycle Route (Regional Cycle Route 40)	Medium	Medium	No Direct Impact (Routes unchanged). Secondary Effects: ▪ Visibility of the Proposed Development from a small proportion of the overall route linking Balloch and Tarbet (17 miles).	Moderate (Localised Significant)
Arden to Helensburgh	Low	Low	No Direct Impact (Route unchanged). Secondary Effects: ▪ The Proposed Development will be visible from a large proportion of the route.	Low
Informal Open Access Site Areas				
Woodbank House Parkland	Low	High	Direct impact as a result of new buildings/structures in an area currently free from buildings. High magnitude of direct change likely to be beneficial in discouraging antisocial behaviour whilst areas of the land remain available for dog walkers. General accessibility of Woodbank House Parkland will be enhanced by the Proposed Development, which will greatly improve the recreational and experiential value of this informal open access site. Secondary Effects: ▪ The Proposed Development will be visible from the parkland around Woodbank House and the visual setting will be changed as a result of buildings being constructed in this area.	Moderate (Localised Significant)
Drumkinnon Bay Beach	High	Low	Beach remains open and accessible during the operation phase. General accessibility of Drumkinnon Bay Beach will be enhanced by the Proposed Development, which will greatly improve the recreational and experiential value of this informal open access site. Secondary Effects: ▪ The Proposed Development will be visible from the beach, however beach is urbanised, human-made and set within context of existing buildings. The visual setting and context will not be materially altered.	Moderate (Localised Significant)
Drumkinnon Bay Beach (North)	Medium	Medium	Beach remains open and accessible during the operation phase. General accessibility of Drumkinnon Bay Beach (North) will be enhanced by the Proposed Development, which will greatly improve the recreational and experiential value of this informal open access site. Secondary Effects:	Moderate (Localised Significant)

Receptor	Sensitivity	Magnitude of Change	Assessment Rationale	Significance of Effect
			▪ The Proposed Development will be visible from the beach, however beach is urbanised, human-made and set within context of existing buildings. The visual setting and context will not be materially altered.	
Drumkinnon Wood	Medium	Low	Drumkinnon Wood remains open and accessible during the construction phase. No development is proposed within the wood. General accessibility of Drumkinnon Wood will be enhanced by the Proposed Development, which will improve the recreational and experiential value of this informal open access site. Secondary Effects: ▪ The Proposed Development and related construction activity will be visible from within the woodland, however it will be relatively screened by surrounding trees. Therefore, the visual setting and context will not be materially altered.	Low
Duncan Mills Memorial Slipway	Medium	Medium	Slipway remains open and accessible during the operation phase. Continuity of access will be maintained and operational activities will not inhibit access. The Proposed Development will enhance the recreational and experiential value of this area. Secondary Effects: ▪ The Proposed Development will be visible from the slipway, however the slipway and surrounding Drumkinnon Bay is urbanised, human-made and set within context of existing buildings. The visual setting and context will not be materially altered.	Duncan Mills Memorial Slipway
Woodland East of Pier Road (including Leven Riverside)	Medium	High	Direct impacts will be experiences as a result of new development in this area and open access being changed to structured access via pathways. Access however will be maintained and designed into the development as set out in the Design & Access Statement. Secondary Effects: ▪ The Proposed Development will be visible from the woodland and Leven riverside and the visual setting will be changed as a result of new development in an area which currently has limited visibility of buildings due to tree cover.	Moderate (Locally Significant)

Table 14-10: Assessment of Operational Phase Effects on Tourism and Recreation

Receptor Grouping	Sensitivity	Magnitude of Change – Visitor attractiveness and Tourism Potential	Assessment Rationale	Significance of Effect
Indoor Tourist Attractions	Low	Medium	Primary Environmental Effects on Tourism Assets: ▪ No likely significant adverse effects predicted. Secondary Environmental Effects on Visitor Attractiveness and Tourism Experience: **Table 14-3** presented in **Appendix 14.2** provides a list of tourism assets within this receptor grouping. Two receptors (Lomond Shores and Sea Life Loch Lomond) have been identified within the Study Area however irrespective of permanent changes in visual amenity, the destinations will continue to provide the same tourism offering, potentially enhanced by the wider visitor offer afforded by the Proposed Development. As detailed in **Chapter 11 – Landscape and Visual**, the Proposed Development will be perceived from a number of locations, including those noted above. This is likely to result in a change in terms of the perceptual experience within the Proposed Development area. All formal and informal access routes to and from the identified receptors will remain unaltered and there will be no restrictions during the operational phase. It is likely that the attractiveness of identified Indoor Tourist Attractions will be enhanced given the nature of the Proposed Development. On this basis, the construction phase is considered likely to result in a permanent Medium Magnitude of Change to visitor attractiveness and tourism potential of Indoor Tourist Attractions. Having regard to the low sensitivity of this receptor grouping, the construction of the Proposed Development is likely to result in a Low / Moderate Effect (Not Significant).	Low / Moderate Effect (Not Significant)
Outdoor Tourist Attractions	Medium	Medium	Primary Environmental Effects on Tourism Assets: ▪ No likely significant adverse effects predicted. Secondary Environmental Effects on Visitor Attractiveness and Tourism Experience: **Table 14-3** presented in **Appendix 14.2** provides a detailed list of tourism assets within this receptor grouping. It is likely that the identified outdoor tourist destinations within the Study Area, irrespective of changes in visual amenity, will continue to	Moderate Effect (Localised Significant)

Receptor Grouping	Sensitivity	Magnitude of Change – Visitor attractiveness and Tourism Potential	Assessment Rationale	Significance of Effect
			provide the same tourism offering, potentially enhanced by the wider visitor offer afforded by the Proposed Development; **Chapter 11 – Landscape and Visual** details that the operation of the Proposed Development has the potential to result in long-term effects on the landscape fabric of the Site and surrounding area. Further, it is noted that any visual effects will be reduced with distance from the Site, as well as screening around the Site. It is acknowledged that the Site is relatively well screened by virtue of its close proximity to existing woodland and the general landform of the surrounding area. All formal and informal access routes to and from the identified receptors will remain unaltered and there will be no restrictions during the operational phase to ensure continuity of access is maintained to and from Outdoor Tourist Attractions, thereby not altering the experiential value or tourism potential of these destinations. On this basis, the construction phase is considered likely to result in a permanent Medium Magnitude of Change to visitor attractiveness and tourism potential of Outdoor Tourist Attractions. Having regard to the medium sensitivity of this receptor grouping, the operation phase is likely to result in a Moderate Effect (Localised Significant).	
Hospitality	Medium	Low	Primary Environmental Effects on Tourism Assets: ▪ No likely significant adverse effects predicted. Secondary Environmental Effects on Visitor Attractiveness and Tourism Experience: **Table 14-3** presented in **Appendix 14.2** provides a detailed list of receptors/assets within this receptor grouping. The primary draw (i.e. food and drink and entertainment offering) and general functionality of hospitality establishments will not be effected by the Proposed Development (as opposed to the visual amenity per se or localised changes to Recreational Activities in the Open Countryside). Indirect local benefits may arise from the operational phase, including the use of hospitality establishments, such as restaurants, by visitors to the Proposed Development. On this basis, the operational phase is considered likely to result in a permanent Low Magnitude of Change, resulting in a Low / Moderate Effect (Not Significant).	Low / Moderate Effect (Not Significant)

Receptor Grouping	Sensitivity	Magnitude of Change – Visitor attractiveness and Tourism Potential	Assessment Rationale	Significance of Effect
Visitor Accommodation	Medium	Low	Primary Environmental Effects on Tourism Assets: ▪ No likely significant adverse effects predicted. Secondary Environmental Effects on Visitor Attractiveness and Tourism Experience: **Table 14-3** presented in **Appendix 14.2** provides a detailed list of receptors/assets within this receptor grouping. The operation of the Proposed Development will not directly impact on any of the visitor accommodation receptors identified. As with the hospitality impact assessment rationale above, the primary draw (i.e. accommodation offering) and functioning of visitor accommodation establishments will not be affected by the Proposed Development. Indirect local benefits may arise from the operational phase, including the use of hotels, B&Bs and other accommodation by visitors to the Proposed Development. On this basis, the operational phase is considered likely to result in a permanent Low Magnitude of Change, resulting in a Low / Moderate Effect (Not Significant).	Low / Moderate Effect (Not Significant)
Recreational Activities in the Open Countryside	Medium	Medium	Primary Environmental Effects on Tourism Assets: View within Loch Lomond and the Trossachs National Park including the Loch, Inchmurrin Island and Ben Lomond: ▪ CT 263: View from Loch Lomond Shores; ▪ LCT 264: Looking towards Inchmurrin Island from Loch Lomond Near Cameron House; ▪ LCT 261: View North East from Three Lochs Way Near Upper Stoneymollan; ▪ LCT 255: View North East from Three Lochs Way near Ben Bowie; and, ▪ Drumkinnon Wood Ancient Woodland Secondary Environmental Effects on Visitor Attractiveness and Tourism Experience: This receptor grouping encompasses a broad range of recreational activities which may be undertaken in the countryside, including hillwalking, swimming, fishing and golf. **Table 14-3** presented in **Appendix 14.2** provides a detailed list of receptors/assets within this receptor grouping. **Chapter 11 – Landscape and Visual Impact**, details that the operation of the Proposed Development will result in direct effects on the landscape fabric of the Site and surrounding area. Visual and setting effects would reduce as a result of distance and screening from adjacent woodland and general landform of the Site. Visual effects	Moderate Effect (Localised significant)

Receptor Grouping	Sensitivity	Magnitude of Change – Visitor attractiveness and Tourism Potential	Assessment Rationale	Significance of Effect
			are not likely to detract from the purpose of specific recreational activities in the open countryside, thereby not altering their recreational or experiential value. **Chapter 5 – Ecology** notes that there is likely to be a permanent adverse impact (localised significant) on the Ancient Woodland at Drumkinnon Wood. Potential impacts identified which may also have an effect on the visitor attractiveness of the receptor include increased recreational pressures on retained areas of Ancient Woodland, including off-site locations. However, from a tourism and recreation perspective, several embedded mitigation measures will be implemented to minimise potential effects on ancient woodland areas, including: prohibiting the use of bikes, ensuring dogs are kept on leads, clear signage of pedestrian routes and provision of information / environmental education boards regarding ancient woodland resource; All formal and informal access routes to, from and within the identified receptors will remain unaltered and there will be no restrictions during the operational phase. Land out with the Site will continue to remain accessible and available for recreational use. On this basis, the construction phase is considered likely to have a temporary Medium Magnitude of Change on this receptor grouping therefore resulting in a Moderate Effect (Localised Significant).	
Tourists travelling (by road) through the open countryside	Medium	Low	Primary Environmental Effects on Tourism Assets: ▪ A82; ▪ A811; ▪ Old Luss Road; ▪ Balloch Road; and, ▪ Other minor roads. Secondary Environmental Effects on Visitor Attractiveness and Tourism Experience: **Table 14-3** presented in **Appendix 14.2** provides a detailed list of receptors/assets within this receptor grouping: **Chapter 6 – Landscape and Visual Impact** notes that there will be no significant visual effects arising from the operation of the Proposed Development on the adjacent road network (namely the A82 and Old Luss Road) as a result of existing screening by the local landform, woodland and trees. Overall, visual effects on the identified roads are however not significant in EIA terms; An assessment of impacts on the experience of tourists travelling through the open countryside must firstly take account of the fact that the primary focus of drivers would be on the road rather than the surrounding area and associated landscapes.	Low / Negligible Effect (Not Significant)

Receptor Grouping	Sensitivity	Magnitude of Change – Visitor attractiveness and Tourism Potential	Assessment Rationale	Significance of Effect
			Taking the above factors into consideration, it is deemed that whilst the visibility of the Proposed Development could momentarily affect the experience of tourists travelling (by road) in the open countryside, this would be insufficient to materially affect the overall tourism experience and thus the attractiveness of the area as a tourist destination. On this basis, the construction phase is considered likely to have a temporary Medium Magnitude of Change on this receptor grouping therefore resulting in a Low / Moderate Magnitude of Change (Not Significant).	

Summary of Operational Phase Effect on Tourism, Recreation and Public Access

14.8.30 **Table 14-11** below provides a summary of the assessed operational phase effects on each of the public access receptors and the visitor attractiveness and tourism potential of each key tourism and recreation receptor grouping. The tourism and recreation assessment has been undertaken on a sectoral basis across the Tourism and Recreation Study Area (i.e. the identified six components of tourism and recreation) rather than focusing on individual tourism assets.

Table 14-11: Operation Phase Summary – Tourism, Recreation and Public Access

Receptor	Significance of Effect
Public Access	
Principal Waling Routes/ Long Distance Paths	
John Muir Way	Moderate (Localised Significant)
Three Lochs Way	Moderate (Localised Significant)
Loch Lomond Shores Walk	Low / Moderate
Balloch Castle Country Park	Low / Moderate
Rights of Way	
SD28 SD29 SD30 SD31 SD 44 SD45 SD46 SD47 SD 53 SD55 SD56 SD57 SD60 SD81 SD82 SD83 SD84 SD 95 (vindicated vehicular right of way)	Low
SD58 SD61 SD62	Low / Moderate
SD 97 SD 99 SD 102 SD103 SD109	Low
SD59 (Other route)	Low / Moderate
Heritage Path	
Stoneymollan Road	Low / Moderate
Core Paths	
Within site boundary	Moderate (Localised Significant)
Outwith site boundary	Low / Moderate
Cycle Paths	
National Cycle Route 7	Moderate (Localised Significant)
West Loch Lomond Cycle Route (Regional Cycle Route 40)	Moderate (Localised Significant)
Arden to Helensburgh	Low
Informal Open Access Site Areas	
Woodbank House Parkland	Moderate (Localised Significant)
Drumkinnon Bay Beach	Moderate (Localised Significant)
Drumkinnon Bay Beach (North)	Moderate (Localised Significant)
Drumkinnon Wood	Low
Duncan Mills Memorial Slipway	Duncan Mills Memorial Slipway
Woodland East of Pier Road (including Leven Riverside)	Moderate (Locally Significant)
Tourism and Recreation	
Indoor Tourist Attractions	Low / Moderate Effect (Not Significant)
Outdoor Tourist Attractions	Moderate Effect (Localised Significant)

Receptor	Significance of Effect
Hospitality	Low / Moderate Effect (Not Significant)
Visitor Accommodation	Low / Moderate Effect (Not Significant)
Recreational Activities in the Open Countryside	Moderate Effect (Localised Significant)
Tourists travelling (by road) through the open countryside	Low / Negligible Effect (Not Significant)

14.9 Further Mitigation and Enhancement

Construction Phase

14.9.1 No additional mitigation for the construction phase is proposed to that covered in the embedded mitigation section. Given the nature and location of the Proposed Development, visual and setting effects are likely during the temporary construction phase of the Proposed Development, including on nearby tourism and recreation assets.

Operation Phase

14.9.2 No additional mitigation for the operational phase is proposed to that covered in the embedded mitigation section. Given the nature and location of the Proposed Development, visual and setting effects are likely during the operational phase of the Proposed Development, including on nearby tourism and recreation assets. However, the sympathetic design and sensitive integration of the Site into the landscape has been a key design objective.

14.10 Residual Effects

Socio-economic Effects

14.10.1 The likely residual socio-economic and labour market effects from the construction and operation of the Proposed Development are identified in **Table 14-12** below.

Table 14-12: Summary of Residual Socio-economic and Labour Market Effects (Construction and Operation)

Potential Effect	Duration	Receptor Sensitivity	Residual Magnitude of Change	Assessment of Residual Effect	Residual EIA Significance	Comments
Construction						
Net Construction Employment	Temporary	Low	Medium	Short Term Minor Beneficial Effect (Effects are important at a local scale)	Short Term Minor Beneficial Effect (Not Significant)	Creation of jobs during the construction phase: ▪ 366 short term construction jobs; and, ▪ 182 net Additional short term jobs. Creation of training and apprenticeship opportunities during the construction phase: ▪ Construction apprentices; ▪ Positive effects could be maximized through enhanced engagement with local construction firms and other supply chain companies; and, ▪ Potential development of local skills which in turn will benefit the local economy.
Net Construction GVA	Temporary	Low	Medium	Short Term Minor Beneficial Effect	Short Term Minor Beneficial Effect (Not Significant)	
Operation						
Key Business Sector – Tourism and Recreation	Permanent	Low	Medium	Long Term Minor Beneficial Effect (Effects are important at a local scale)	Long Term Minor Beneficial Effect (Not Significant)	Creation of jobs during the operational phase: ▪ 200 gross operational FTEs; and, ▪ 33 net additional operational FTEs.

Potential Effect	Duration	Receptor Sensitivity	Residual Magnitude of Change	Assessment of Residual Effect	Residual EIA Significance	Comments
						Positive effects could be maximized through local careers, employability and recruitment services.

Tourism, Recreation and Public Access Effects

14.10.2 Taking account of the proposed mitigation and enhancement measures, the likely residual effects from the construction and operation of the Proposed Development are identified in **Table 14-13** below. The overall significance of the effect is then presented in the final column with reference to **Table 14-2.** The effects described here which are moderate or major are, in all cases adverse effects, and are considered to be significant in EIA terms.

Table 14-13: Summary of Residual Public Access Effects (Construction and Operation)

Potential Effect	Duration	Receptor Sensitivity	Residual Magnitude of Change	Assessment of Residual Effect	Residual EIA Significance	Comments
Construction						
Principal Walking Routes						
John Muir Way	Temporary	High	Medium	Short Term Moderate Effect	Short Term Moderate Effect (Localised Significant)	Limited visual impact and in some cases screening in the form of intervening landform and existing vegetation will reduce this. In particular, visual effects along long distance paths such as the John Muir Way only impact a small proportion of the overall route. Physical disturbance during construction. Any impacts during the construction phase will be short term and localised diversions will be put in place. Some receptors which enter the Site, such as the John Muir Way, will be upgraded and enhanced as part of the Proposed Development.
Three Lochs Way	Temporary	High	Medium	Short Term Moderate Effect	Short Term Moderate Effect (Localised Significant)	Limited visual impact and in some cases screening in the form of

Potential Effect	Duration	Receptor Sensitivity	Residual Magnitude of Change	Assessment of Residual Effect	Residual EIA Significance	Comments
						intervening landform and existing vegetation will reduce this. In particular, visual effects along long distance paths such as the Three Lochs Way only impact a small proportion of the overall route. Physical disturbance during construction. Any impacts during the construction phase will be short term and localised diversions will be put in place. Some receptors (formal and informal) which enter the Site will be upgraded and enhanced as part of the Proposed Development.
Loch Lomond Shores Walk	Temporary	Low	Medium	Short Term Low / Moderate Effect	Short Term Low / Moderate (Not Significant)	The Proposed Development and related construction activity will be visible for a large proportion of the route. No physical disturbance during construction.
Balloch Castle Country Park	Temporary	Low	Medium	Short Term Low / Moderate Effect	Short Term Low / Moderate Effect (Not Significant)	The Proposed Development and related construction activity will be visible for a large proportion of the identified receptor. No physical disturbance during construction.
Rights of Way						
SD28 SD29 SD30 SD31 SD 44 SD45 SD46 SD47 SD 53 SD55 SD56 SD57 SD60 SD81 SD82	Temporary	Low	Low	Short Term Low Effect	Short Term Low Effect (Not Significant)	No identified visibility of the Proposed Development or related construction activity (outside ZTV). No physical disturbance during construction.

Potential Effect	Duration	Receptor Sensitivity	Residual Magnitude of Change	Assessment of Residual Effect	Residual EIA Significance	Comments
SD83 SD84 SD 97 SD 99 SD103						
SD58 SD61 SD62 SD 102	Temporary	Low	Medium	Short Term Low Effect	Short Term Low / Moderate Effect (Not Significant)	The Proposed Development and related construction activity will be visible from a large proportion of the route. No physical disturbance during construction.
SD 95 (vindicated vehicular right of way)	Temporary	Low	Low	Short Term Low Effect	Short Term Low Effect (Not Significant)	No identified visibility of the Proposed Development and related construction activity. Route potentially enters the Site however there will be no physical disturbance or severance as a result of construction activity.
SD109	Temporary	Low	Low	Short Term Low Effect	Short Term Low Effect (Not Significant)	The Proposed Development and related construction activity will be visible from a large proportion of the route. No physical disturbance during construction.
SD59 (Other route)	Temporary	Low	Medium	Short Term Low Effect	Short Term Low / Moderate Effect (Not Significant)	The Proposed Development and related construction activity will be visible from a large proportion of the route however this will likely be screened by existing woodland. No physical disturbance during construction.
Heritage Path						
Stoneymollan Road	Temporary	Low	Medium	Short Term Low / Moderate Effect	Short Term Low / Moderate Effect (Not Significant)	Construction will be highly visible from a large proportion of Stoneymollan Road (in particular Landscape Character Type 261: View North East from Three Lochs Way Near Upper Stoneymollan as

Potential Effect	Duration	Receptor Sensitivity	Residual Magnitude of Change	Assessment of Residual Effect	Residual EIA Significance	Comments
						identified in **Chapter 11 – Landscape and Visual Impact**). No physical disturbance during construction.
Core Paths						
Within site boundary	Temporary	Medium	Medium	Short Term Moderate Effect	Short Term Moderate Effect (Localised Significant)	The Proposed Development and related construction activity will be visible from core paths within the Site boundary. Direct impact managed and maintained through the site via temporary localised diversions during the construction period. Managed via Access Management Plan.
Outwith site boundary	Temporary	Medium	Low	Short Term Low / Moderate Effect	Short Term Low / Moderate Effect (Not Significant)	The Proposed Development and related construction activity may be visible from some core paths outwith the Site boundary. No physical disturbance during construction.
Cycle Paths						
National Cycle Route 7	Temporary	High	Low	Short Term Moderate Effect	Short Term Moderate Effect (Localised Significant)	Limited visibility of parts of the Proposed Development and related construction activity from a very small proportion of the overall route linking Sunderland and Inverness (601 miles). No physical disturbance during construction.
West Loch Lomond Cycle Route (Regional Cycle Route 40)	Temporary	Medium	Medium	Short Term Moderate Effect	Short Term Moderate Effect (Localised Significant)	Visibility of the Proposed Development and related construction activity from a small proportion of the overall route linking Balloch and Tarbet (17 miles).

Potential Effect	Duration	Receptor Sensitivity	Residual Magnitude of Change	Assessment of Residual Effect	Residual EIA Significance	Comments
						No physical disturbance during construction.
Arden to Helensburgh	Temporary	Low	**Low**	Short Term Low Effect	Short Term Low Effect (Not Significant)	The Proposed Development and related construction activity will be visible from a large proportion of the route. No physical disturbance during construction.
Informal Open Access Site Areas						
Woodbank House Parkland	Temporary	Low	High	Short Term Moderate Effect	Short Term Moderate Effect (Localised Significant)	The Proposed Development and related construction activity will be highly visible from the parkland around Woodbank House. The visual setting will therefore be changed as a result of buildings being constructed in this area. Direct impact as a result of buildings being constructed in an area currently free from buildings. High residual magnitude of direct change likely to be beneficial in terms of discouraging antisocial behaviour whilst areas of the land remain available for dog walkers. An AMP will ensure continuity of access is maintained in the form of temporary localised diversions were appropriate.
Drumkinnon Bay Beach	Temporary	High	Low	Short Term Moderate Effect	Short Term Moderate Effect (Localised Significant)	The Proposed Development and related construction activity will be visible from the beach, however the beach is urbanised, human-made and set within the context of existing buildings. The visual setting will therefore be materially altered.

Potential Effect	Duration	Receptor Sensitivity	Residual Magnitude of Change	Assessment of Residual Effect	Residual EIA Significance	Comments
						Beach remains open and accessible during the construction phase, with local diversions in place where appropriate to ensure continuity of access, as per an AMP.
Drumkinnon Bay Beach (North)	Temporary	Medium	Low	Short Term Low / Moderate Effect	Short Term Low / Moderate Effect (Not Significant)	The Proposed Development and related construction activity will be visible from the beach, however the beach is urbanised, human-made and set within the context of existing buildings. The visual setting will therefore be materially altered. Beach remains open and accessible during the construction phase, with local diversions in place where appropriate to ensure continuity of access, as per an AMP.
Drumkinnon Wood	Temporary	Medium	Low	Short Term Low / Moderate Effect	Short Term Low / Moderate Effect (Not Significant)	The Proposed Development and related construction activity will be visible from eithin the woodland, however it will be relatively screened by surrounding trees. Therefore, the visual setting and context will not be materially altered. Drumkinnon Wood remains open and accessible during the construction phase, there will be no development or related construction activity in this area of woodland.
Duncan Mills Memorial Slipway	Temporary	Medium	Low	Short Term Moderate / Low Effect	Short Term Moderate / Low Effect (Localised Significant)	The Proposed Development and related construction activity will be visible from the slipway, however the slipway and surrounding Drumkinnon Bay is urbanised, man-made and set within context of existing buildings. The visual

Potential Effect	Duration	Receptor Sensitivity	Residual Magnitude of Change	Assessment of Residual Effect	Residual EIA Significance	Comments
						setting and context will not be materially altered. Slipway remains open and accessible during the construction phase.
Woodland East of Pier Road (including Leven Riverside)	Temporary	Medium	High	Short Term Moderate Effect	Short Term Moderate Effect (Localised Significant)	Direct impacts will be experiences as a result of buildings being constructed in this area and open access being changed to structured access via pathways. Access however will be maintained and designed into the development as set out in the Design & Access Statement. Temporary localised diversions will occur during the construction period as set out in an AMP. The Proposed Development and related construction activity will be visible from the woodland and Leven Riverside and the visual setting will be changed as a result of buildings being constructed in an area which currently has limited visibility of buildings due to tree cover.
Operation						
Principal Walking Routes						
John Muir Way	Permanent	High	Medium	Long Term Moderate Effect	Long Term Moderate Effect (Localised Significant)	Limited visual impact and in some cases screening in the form of intervening landform and existing vegetation will reduce this. In particular, visual effects along long distance paths such as the John Muir Way only impact a small proportion of the overall route.

Potential Effect	Duration	Receptor Sensitivity	Residual Magnitude of Change	Assessment of Residual Effect	Residual EIA Significance	Comments
						No physical disturbance during the operational phase. The accessibility of identified receptors will remain unrestricted during the operational phase of the Proposed Development. Some receptors which enter the Site, such as the John Muir Way, will be upgraded and enhanced as part of the Proposed Development, so in the long term this will provide beneficial impacts to users.
Three Lochs Way	Permanent	High	Medium	Long Term Moderate Effect	Long Term Moderate Effect (Localised Significant)	Limited visual impact and in some cases screening in the form of intervening landform and existing vegetation will reduce this. In particular, visual effects along long distance paths such as the Three Lochs Way only impact a small proportion of the overall route. No physical disturbance during the operational phase. The accessibility of identified receptors will remain unrestricted during the operational phase of the Proposed Development. Some receptors which enter the Site will be upgraded and enhanced as part of the Proposed Development, so in the long term this will provide beneficial impacts to users.
Loch Lomond Shores Walk	Permanent	Low	Medium	Long Term Low / Moderate Effect	Long Term Low / Moderate Effect (Not Significant)	No physical / material change during the operational phase. The Proposed Development will be visible for a large proportion of the route.

Potential Effect	Duration	Receptor Sensitivity	Residual Magnitude of Change	Assessment of Residual Effect	Residual EIA Significance	Comments
Balloch Castle Country Park	Permanent	Low	Medium	Long Term Low / Moderate Effect	Long Term Low / Moderate Effect (Not Significant)	No physical / material change during the operational phase. The Proposed Development will be visible for a large proportion of the identified receptor.
Rights of Way						
SD28 SD29 SD30 SD31 SD 44 SD45 SD46 SD47 SD 53 SD55 SD56 SD57 SD60 SD81 SD82 SD83 SD84 SD 95 (vindicated vehicular right of way)	Permanent	Low	Low	Long Term Low Effect	Long Term Low Effect (Not Significant)	No physical / material change during the operational phase. No identified visibility of the Proposed Development.
SD58 SD61 SD62	Permanent	Low	Medium	Long Term Low / Moderate Effect	Long Term Low / Moderate Effect (Not Significant)	No physical / material change during the operational phase. The Proposed Development will be visible from a large proportion of the route.
SD 97 SD 99 SD 102 SD103 SD109	Permanent	Low	Low	Long Term Low Effect	Long Term Low Effect (Not Significant)	No physical / material change during the operational phase. The Proposed Development will be visible from a large proportion of the route.
SD59 (Other route)	Permanent	Low	Medium	Long Term Low / Moderate Effect	Long Term Low / Moderate Effect (Not Significant)	No physical / material change during the operational phase. The Proposed Development will be visible from a large proportion of the route however this will likely be screened by existing woodland.

Potential Effect	Duration	Receptor Sensitivity	Residual Magnitude of Change	Assessment of Residual Effect	Residual EIA Significance	Comments
Heritage Path						
Stoneymollan Road	Permanent	Low	Medium	Long Term Low / Moderate Effect	Long Term Low / Moderate Effect (Not Significant)	No physical / material change during the operational phase. The Proposed Development will be highly visible from Stoneymollan Road (in particular Landscape Character Type 261: View North East from Three Lochs Way Near Upper Stoneymollan as identified in **Chapter 11 – Landscape and Visual Impact**).
Core Paths						
Within site boundary	Permanent	Medium	Medium	Long Term Moderate Effect	Long Term Moderate Effect (Localised Significant)	Routes will be enhanced as a result of the Proposed Development, improving access and the recreational and experiential value of these routes. The Proposed Development will be visible from core paths within the Site boundary.
Outwith site boundary	Permanent	Medium	Low	Long Term Low / Moderate Effect	Long Term Low / Moderate Effect (Not significant)	No physical / material change during the operational phase. The Proposed Development may be visible from some core paths outwith the Site boundary.
Cycle Paths						
National Cycle Route 7	Permanent	High	Low	Long Term Moderate Effect	Long Term Moderate Effect (Localised Significant)	No physical / material change during the operational phase. Limited visibility of parts of the Proposed Development from a very small proportion of the overall route linking Sunderland and Inverness (601 miles).
West Loch Lomond Cycle	Permanent	Medium	Medium	Long Term Moderate Effect	Long Term Moderate Effect (Localised Significant)	No physical / material change during the operational phase.

Potential Effect	Duration	Receptor Sensitivity	Residual Magnitude of Change	Assessment of Residual Effect	Residual EIA Significance	Comments
Route (Regional Cycle Route 40)						Visibility of the Proposed Development from a small proportion of the overall route linking Balloch and Tarbet (17 miles).
Arden to Helensburgh	Permanent	Low	Low	Long Term Low Effect	Long Term Low Effect (Not significant)	No physical / material change during the operational phase. The Proposed Development will be visible from a large proportion of the route.
Informal Open Access Site Areas						
Woodbank House Parkland	Permanent	Low	High	Long Term Moderate Effect	Long Term Moderate Effect (Localised Significant)	Direct impact as a result of new buildings in an area currently free from buildings. High magnitude of direct change likely to be beneficial in discouraging antisocial behaviour whilst areas of the land remain available for dog walkers. General accessibility of Woodbank House Parkland will be enhanced by the Proposed Development, which will improve the recreational and experiential value of this informal open access site. The Proposed Development will be visible from the parkland around Woodbank House and the visual setting will be positively changed as a result of the restoration work to be undertaken and buildings being constructed in this area.
Drumkinnon Bay Beach	Permanent	Medium	Low	Long Term Moderate / Low Effect	Long Term Moderate / Low Effect (Localised Significant)	Beach remains open and accessible during the operation phase. General accessibility of Drumkinnon Bay Beach will be enhanced by the Proposed

Potential Effect	Duration	Receptor Sensitivity	Residual Magnitude of Change	Assessment of Residual Effect	Residual EIA Significance	Comments
						Development, which will improve the recreational and experiential value of this informal open access site. The Proposed Development will be visible from the beach, however beach is urbanised, human-made and set within context of existing buildings. The visual setting and context will not be materially altered.
Drumkinnon Bay Beach (North)	Permanent	Medium	Low	Long Term Moderate / Low Effect	Long Term Moderate / Low Effect (Localised Significant)	Beach remains open and accessible during the operation phase. General accessibility of Drumkinnon Bay Beach will be enhanced by the Proposed Development, which will improve the recreational and experiential value of this informal open access site. The Proposed Development will be visible from the beach, however beach is urbanised, human-made and set within context of existing buildings. The visual setting and context will not be materially altered.
Drumkinnon Wood	Permanent	Medium	Low	Long Term Moderate / Low Effect	Long Term Moderate / Low Effect (Localised Significant)	Drumkinnon Wood remains open and accessible during the operational phase. General accessibility of Drumkinnon Wood will be enhanced by the Proposed Development, which will improve the recreational and experiential value of this informal open access site. The Proposed Development will be visible from the woodland, however it will be relatively screened by

Potential Effect	Duration	Receptor Sensitivity	Residual Magnitude of Change	Assessment of Residual Effect	Residual EIA Significance	Comments
						surrounding trees. Therefore, the visual setting and context will not be materially altered.
Duncan Mills Memorial Slipway	Permanent	Medium	Low	Long Term Moderate / Low Effect	Long Term Moderate / Low Effect (Localised Significant)	Slipway remains open and accessible during the operation phase. Continuity of access will be maintained and operational activities will not inhibit access. The Proposed Development will enhance the recreational and experiential value of this area. The Proposed Development will be visible from the slipway, however the slipway and surrounding Drumkinnon Bay is urbanised, human-made and set within context of existing buildings. The visual setting and context will not be materially altered.
Woodland East of Pier Road (including Leven Riverside)	Permanent	Medium	High	Long Term Moderate Effect	Long Term Moderate Effect (Localised Significant)	Direct impacts will be experienced as a result of new development in this area and open access being changed to structured access via pathways. Access however will be maintained and designed into the development as set out in the Design & Access Statement. The Proposed Development will be visible from the woodland at Leven Riverside and the visual setting will be changed as a result of new development in an area which currently has limited visibility of buildings due to tree cover.

Table 14-14 - Summary of Residual Tourism and Recreation Effects (Construction and Operation)

Potential Effect	Duration	Receptor Sensitivity	Residual Magnitude of Change	Assessment of Residual Effect	Residual EIA Significance	Comments
Construction						
Indoor Tourist Attractions	Temporary	Low	Low	Short Term Low Effect	Short Term Low Effect (Not Significant)	Visual impact is likely to occur during construction, due to close proximity to the Proposed Development. The presence of the Proposed Development is unlikely to make visitors stay away from existing Indoor Tourist Attraction (Loch Lomond Shores and Sea Life Loch Lomond). It is likely that Indoor Tourist Attractions will continue to provide the same tourism offering. No physical disturbance will take place.
Outdoor Tourist Attractions	Temporary	Medium	Medium	Short Term Moderate Effect	Short Term Moderate Effect (Localised Significant)	Visual impact is likely to occur during construction, particularly around receptors in close proximity to the Proposed Development (Drumkinnon Bay Beach etc.). However, the use of sensitive design and materials could reduce this further. No physical disturbance will take place and access to receptors (such as the River Leven and Loch Lomond shoreline) and access will be maintained during construction.
Hospitality	Temporary	Medium	Low	Short Term Low / Moderate Effect	Short Term Low / Moderate Effect (Not Significant)	Visual impact is unlikely to result in a change in visitor attractiveness during the construction phase as the visual setting is not the primary draw for potential visitors. The construction of the Proposed Development is unlikely to detract visitors from existing Hospitality establishments. It is likely that Hospitality receptors will continue to provide the same offering, with indirect local benefits in the

Potential Effect	Duration	Receptor Sensitivity	Residual Magnitude of Change	Assessment of Residual Effect	Residual EIA Significance	Comments
						form of additional construction workers using local restaurants etc. No physical disturbance will take place.
Visitor Accommodation	Temporary	Medium	Low	Short Term Low / Moderate Effect	Short Term Low / Moderate Effect (Not Significant)	Visual impact is unlikely to result in a change in visitor attractiveness during the construction phase as the visual setting is not the primary draw for potential visitors. The construction of the Proposed Development is unlikely to detract visitors from existing Visitor Accommodation establishments. It is likely that Hospitality receptors will continue to provide the same offering, with indirect local benefits in the form of construction workers using local accommodation. No physical disturbance will take place.
Recreational Activities in the Open Countryside	Temporary	Medium	Medium	Short Term Moderate Effect	Short Term Moderate Effect (Localised Significant)	Limited visual impact and in some cases screening in the form of intervening landform and existing vegetation will reduce this. Any impacts during the construction phase will be short term and localised diversions will be put in place where access to key receptors if affected (such as the River Leven, Loch Lomond shoreline and Drumkinnon Bay Beach). Access to some receptors (such as Drumkinnon Bay Beach and the River Leven) will be enhanced as part of the proposed development, so in the long term this will provide beneficial impacts to users.
Tourists travelling (by road) through the open countryside	Temporary	Medium	Low	Short Term Low / Moderate Effect	Short Term Low / Moderate Effect (Not Significant)	Limited visual impact will be experienced along the identified routes (such as the A82, Old Luss Road and Balloch Road) and in some cases screening in the form of intervening landform and existing vegetation will reduce this.

Potential Effect	Duration	Receptor Sensitivity	Residual Magnitude of Change	Assessment of Residual Effect	Residual EIA Significance	Comments
						Any impacts during the construction phase will be short term and localised in nature. No physical disturbance will be experienced.
Operation						
Indoor Tourist Attractions	Permanent	Low	Medium	Long Term Minor Effect	Long Term Low / Moderate Effect (Not Significant)	Visual impact is likely to occur during operation, due to the close proximity of the Proposed Development. The presence of the Proposed Development is unlikely to make visitors stay away from existing Indoor Tourist Attraction (Loch Lomond Shores and Sea Life Loch Lomond). It is likely that Indoor Tourist Attractions will continue to provide the same tourism offering, potentially with enhanced visitor numbers as a result of the wider visitor offer afforded by the Proposed Development. No physical disturbance will take place.
Outdoor Tourist Attractions	Permanent	Medium	Medium	Long Term Minor Effect	Long Term Moderate Effect (Localised Significant)	Visual impact is likely to occur during operation, particularly around receptors in close proximity to the Proposed Development (Drumkinnon Bay Beach etc.). However, the use of sensitive design techniques (i.e. screening) and natural materials will reduce this further. No physical disturbance will take place and access to receptors (such as the River Leven and Loch Lomond shoreline) will be remain unrestricted during operation.
Hospitality	Permanent	Medium	Low	Long Term Minor Effect	Long Term Low / Moderate Effect (Not Significant)	Visual impact is unlikely to result in a change in visitor attractiveness during the operational phase as the visual setting is not the primary draw for visitors.

Potential Effect	Duration	Receptor Sensitivity	Residual Magnitude of Change	Assessment of Residual Effect	Residual EIA Significance	Comments
						The presence of the Proposed Development is unlikely to detract visitors from existing Hospitality establishments. It is likely that Hospitality receptors will continue to provide the same offering, potentially with enhanced customer numbers as a result of the wider visitor offer afforded by the Proposed Development. No physical disturbance will take place.
Visitor Accommodation	Permanent	Medium	Low	Long Term Minor Effect	Long Term Low / Moderate Effect (Not Significant)	Visual impact is unlikely to result in a change in visitor attractiveness during the operational phase as the visual setting is not the primary draw for potential visitors. The presence of the Proposed Development is unlikely to detract visitors from existing Visitor Accommodation establishments. It is likely that Hospitality receptors will continue to provide the same offering, potentially enhanced by the wider visitor offer afforded by the Proposed Development. No physical disturbance will take place.
Recreational Activities in the Open Countryside	Permanent	Medium	Medium	Long Term Minor Effect	Long Term Moderate Effect (Localised Significant)	Limited visual impact and in some cases screening in the form of intervening landform and existing vegetation will reduce this. No physical disturbance during the operational phase. The accessibility of identified receptors will remain unrestricted during the operational phase. Access to some receptors via the Site, such as to Drumkinnon Bay Beach, the River Leven Shoreline and Drumkinnon Wood, will be upgraded and enhanced as part of the Proposed Development, so in the long term this will provide beneficial impacts to users.

Potential Effect	Duration	Receptor Sensitivity	Residual Magnitude of Change	Assessment of Residual Effect	Residual EIA Significance	Comments
Tourists travelling (by road) through the open countryside	Permanent	Medium	Medium	Long Term Minor Effect	Long Term Low / Moderate Effect (Not Significant)	As during construction, limited visual impact will be experienced along routes such as the A82, Old Luss Road and Balloch Road. Screening in the form of intervening landform and existing vegetation will reduce this. No physical disturbance will be experienced.

14.11 Monitoring

14.11.1 In the absence of any likely significant adverse effects, no monitoring is considered to be proportionate or required.

14.12 Cumulative Effects

Cumulative Development

14.12.1 The EIA Regulations require an assessment of the likely significant cumulative effects of the Proposed Development and other approved developments, at construction and operational stages. However, as noted in the Scoping Opinion (Ref PSC/2021/0005) received from the LLTNPA, there are no known significant terrestrial development proposals within the immediate area of the National Park to be considered in this ES Chapter.

Labour Market Absorption Capacity

14.12.2 **Table 14-15** below demonstrates that there is sufficient labour in a 60-minute drive time of the Proposed Development.

14.12.3 The labour market requirements to build each project in accounts for less than 5% of each of the labour market category including the construction workforce. This demonstrates that should cumulative projects be built at the same time, there would still be sufficient labour market capacity without creating any labour market distortions.

Table 14-15: Absorption Capacity

Absorption Capacity	Drivetimes			
	15 Minutes	30 Minutes	45 Minutes	Scotland
Construction Worker as % of				
Economically Active	1.5%	0.2%	0.0%	0.0%
Economically Active (Unemployed)	18.1%	2.2%	0.4%	0.2%
Highly Skilled	4.7%	0.5%	0.1%	0.0%
Skilled	4.4%	0.7%	0.1%	0.0%
Semi-skilled & Unskilled	4.4%	0.7%	0.1%	0.0%
Construction	23.4%	3.7%	0.5%	0.2%
Construction FTE jobs as % of:				
Economically Active	0.1%	0.0%	0.0%	0.0%
Economically Active (Unemployed)	1.8%	0.2%	0.0%	0.0%
Highly Skilled	0.5%	0.0%	0.0%	0.0%
Skilled	0.4%	0.1%	0.0%	0.0%
Semi-skilled & Unskilled	0.4%	0.1%	0.0%	0.0%
Construction	2.3%	0.4%	0.1%	0.0%

14.13 Summary

Socio-economics

14.13.1 The socio-economic assessment shows that the Proposed Development will have a minor beneficial socio-economic impact through temporary construction employment and indirect employment supported through supply chain linkages in the wider economy and also job creation during the operation of the Proposed Development.

Tourism, Recreation and Public Access

14.13.2 The assessment of tourism, recreation and public access shows that the vast majority of receptors will experience no significant effects. Formal and informal public access routes, such as the John Muir Way, Three Lochs Way, Lomond Shores Way and access to Drumkinnon Bay Beach have the potential to experience localised significant effects in the short term. However, as detailed within the Embedded Mitigation (see **Section 14.7**), an AMP will ensure continuity of access is maintained in the form of temporary localised diversions during the construction phase. Whilst temporary and intermittent, this change will not inhibit access or greatly alter the recreational or experiential value of these routes.

14.13.3 Overall, it is unlikely that the presence of the Proposed Development would result in a change in the visitor attractiveness or tourism potential identified tourism, recreation and public access receptors to such an extent that would result in an adverse effect in the long term. It is likely that the Proposed Development will enhance visitor attractiveness and numbers resulting in long term permanent beneficial effects for the local and regional tourism sector and visitor economy.

14.14 References

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15 Impact Interactions

15.1 Introduction

15.1.1 The direct and indirect effects of the proposed development have been assessed within the relevant topic chapters of the EIAR (**Chapters 5 – 14**) and prepared by competent experts for the purposes of this EIA, as defined within the Town and Country Planning (EIA) (Scotland) Regulations 2017 as amended ('the EIA Regulations'). Environmental effects are assessed relative to the topic under consideration. This approach can lead to the interaction of effects being reported in separate chapters but combined effects on the same environmental receptor(s) not being considered. This chapter therefore considers the principal findings of each topic chapter of the EIAR to enable assessment of the potential for impact interactions. In doing so, the chapter also provides a summary of the likely significant environmental effects identified throughout the EIAR.

15.2 Methodology

15.2.1 The assessment methodology for combined effects involves the identification of impact interactions associated with both the construction and operational phases of the proposed development upon one or more environmental resources. This is undertaken using a qualitative appraisal process which has been used for numerous EIAs and draws upon best practice guidance, as detailed in **Section 3.7**.

15.2.2 The assessment of the significance of individual and cumulative effects has been based on the generic significance criteria provided in **Table 3-1**, although as detailed in Subsection 3 of each technical assessment EIAR chapter, topic-specific significance threshold criteria have been developed in accordance with relevant legislation, policy, technical guidance and standards. These significance criteria are also relevant when assessing likely interactions between individual predicted environmental effects.

15.3 Environmental Interactions and Combined Effects

15.3.1 Taking account of embedded and proposed mitigation and mitigation measures identified through the EIAR and in the Summary sections in **Chapter 3** and **Chapter 16**, including the development and implementation of a CEMP, a Landscape Management Plan, a Biodiversity Management Plan and a Travel Plan, no residual significant adverse environmental effects are predicted to arise from the proposed development.

15.3.2 The technical assessments presented in **Chapters 5-14** conclude that proposed construction activities and the subsequent operation of the proposed development could result in a number of adverse, albeit not significant, environmental effects (both individually from the proposed development and cumulatively with effects from cumulative developments). The interaction of these effects could generate overarching health and amenity effects, which are considered in turn below.

Health Risks and Effects

15.3.3 In the context of the proposed development, health risks and effects on human health have the potential to arise from:

- Direct effects relating to pollution and the quality of the environment (e.g. from noise and air quality emissions, including dust effects). These types of effects are primarily predicted to occur during the construction phase, although operational effects are also predicted from road traffic impacts; and,
- Indirect effects relating to the quality of the built environment and the provision, accessibility and green infrastructure.

15.3.4 The technical assessments conclude that no residual significant adverse environmental effects will occur from the proposed development with only localised effects occurring. In addition, predicted emissions (noise and air pollutants) will remain within legally accepted limits.

15.3.5 Taking account of proposed mitigation and enhancement measures, the proposed development will result in residual minor and not significant beneficial effects on health risks and effects.

Amenity and Visual Effects

15.3.6 It is considered that due to the site's location on the boundary of the LLTTNP and by being in an area already impacted by development, coupled with its lack of perceptibility, the proposed development would only cause Negligible long-term landscape and visual effects on the assessed Study Area and the LLTTNP, its Special Landscape Qualities and users.

15.3.7 The John Muir Way, The Three Lochs Way and Loch Lomond Shores have the potential to experience localised significant adverse effects. This is due to the proximity of these receptors to the proposed development and limited opportunities to mitigate the changes in view. It is unlikely that the presence of the proposed development will result in a change in visitor numbers to these receptors to such an extent that would result in an adverse effect in the long term.

15.3.8 the construction and operational phases of the proposed development are predicted to result in a number of effects on the physical environment. These have the potential to affect the same receptors (such as dwellings adjacent to the site) and, depending on the phasing of construction activities, could occur simultaneously. This has the potential to generate combined effects on quality of life and residential amenity.

15.3.9 However, a key role of the proposed CEMP will be to co-ordinate construction activities and mitigation measures to minimise all potential effects on both environmental and amenity receptors.

15.3.10 Taking account of proposed mitigation and enhancement measures, the proposed development will result in residual minor and not significant beneficial effects on amenity and visual effect.

16 Schedule Of Further Mitigation and Enhancement

16.1.1 The table below lists the further mitigation and enhancement measures which have been proposed in the technical assessment **Chapters 5 -14**.

Table 16-1: Schedule of Proposed Further Mitigation and Enhancement Measures

EIAR Chapter and Topic	Proposed Further Mitigation and Enhancement Measures
Chapters 5 & 6 – Ecology and Trees & Woodland	**Construction Phase**
	Good practice measures when working in or near to watercourses will be adhered to.
	Appointment of Ecological Clerk of Works (ECoW) team to monitor compliance, produce auditable records and provide onsite advice (different environmental constraints may require ECoWs of differing specialisms).
	Pre-construction and regular protected species surveys.
	Provision of information regarding ecological sensitivities as part of site induction. Toolbox talk for all operatives regarding habitat and species in area.
	Seasonal working checks and restrictions: where vegetation (including woodland, grassland, hedgerow, scrub and trees) clearance is to be undertaken in March to August inclusive, a pre-works nesting bird check would be carried out by a suitably qualified ecologist. If nesting birds are found an appropriate works exclusion area would be put in place to protect the nest until the young have fledged.
	Implementation of 10mph speed limit for all site traffic.
	Safeguarding of protected species: In the event that a protected species is discovered on site, the contractor will be expected to comply with relevant legislation and guidance. Where necessary all work in that area would stop immediately and the site ECoW contacted.
	Site compounds/material and plant storage areas to be located as far as possible from watercourses.
	If construction work is carried out during the hours of darkness, machinery and floodlights will be directed away from watercourses. Use of heavy machinery and pile drivers will be limited to avoid two hours before and after dawn and dusk within 30 m of watercourses or waterbodies.
	Commitment to site and design working areas and building footprints (at detailed design stage) with the objectives of minimizing habitat disturbance/loss and safeguarding important ecological features (IEF).
	Undertaking an early flowering plants survey prior to the detailed design of the proposed development.
	Any trenches or pits made during construction (for example that may be present to lay infrastructure) to be covered at the end of each working day or a wooden plank placed inside to allow any mammal species to escape, should it fall in. Any temporarily exposed open pipe system to be capped in such a way as to prevent wildlife gaining access.
	Use of geoweb to protect adjacent tree rooting systems from development within woodland.
	Porous gravel or similar for proposed parking.

EIAR Chapter and Topic	Proposed Further Mitigation and Enhancement Measures
	Turf translocation if required.
	Tree survey to be undertaken of focused areas of the development to provide information on individual trees in relation to design and construction. This would informing the production of method statements for particular construction activities within woodland habitats.
	New planting to compensate for any tree loss within the development footprint shall comprise native species trees reflecting the desired semi-natural oak woodland of Drumkinnon and Woodbank woodland features; and the alder dominated riparian woodland of the River Leven. New planting shall also include a mix of appropriate understory trees and shrub species particular to these woodland types such as birch, hazel, rowan, holly and willow species.
	Operational Phase
	Commitment for street lighting and other lighting associated with the development to be designed (at detailed design stage) in consideration with habitat use by nocturnal species. Where possible lighting to be positioned upon or around the completed development so it would not illuminate surrounding woodland and watercourses.
	An appropriate speed limit (10mph or less) to be applied to all traffic.
	Visitor management facilities/entrance area to incorporate suitably sized and located waste and recycling receptacles, to be combined with appropriate collection and transportation regimes.
	Management of the riparian and shoreline habitats, including the removal of invasive plant species and encouraging appropriately vegetated banks comprising native woodland species, to enhance the composition of vegetated connectivity between woodland and watercourses.
	An infusion of native, berry producing, shrub species to be planted within existing woodlands and along connective linear vegetated features to enhance the foraging and sheltering resource for a variety of mammal and bird species which may frequent the site in the future.
	Provision of information/ environmental education boards regarding woodland resource.
	Annual vegetation and protected species surveys.
Chapter 7 – Noise and Vibration	**Construction Phase**
	A Construction Environmental Management Plan (CEMP) will be prepared prior to construction. Further mitigation is not expected.
	Operational Phase
	The level of significance of noise impact within the current masterplan is minor. The design mitigation features incorporated into the final masterplan design is of one stretch of 2m high close boarded timber garden fencing at the garden /terrace boundary of NSR 11.
Chapter 8 – Air Quality	**Construction Phase**
	Taking account of proposed embedded mitigation measures, the assessment predicts that no significant effects on air quality are considered likely. No further mitigation, compensation or enhancement measures are therefore required or proposed.
	Operational Phase
	Not Required.

EIAR Chapter and Topic	Proposed Further Mitigation and Enhancement Measures
Chapter 9 – Ground Conditions and Geology	**Construction Phase**
	Additional intrusive investigation will require to be undertaken in specific localised areas to inform detailed design and delineate contamination. The results will be assessed in the context of the detailed master plan and, if required, a remediation strategy will be developed: ▪ If required, remediation is likely to comprise localised excavation of contaminated soils and / or capping with clean material to present a barrier between contamination and receptors. ▪ In the case of proposed buildings or areas of hardstanding, the barrier will be integral to the design of the new development. and; ▪ Further intrusive investigation may be required in within and around the derelict buildings in the Woodbank House area to determine the potential for contaminants of concern including asbestos and PAHs. It is understood that the existing relic buildings will be renovated to form apartment accommodation.
	Operational Phase
	None Required.
Chapter 10 – Water, Hydrology and Flood Risk	**Construction Phase**
	Further mitigation to be included in CEMP.
	As noted in Section 10.6, the commitment to develop and implement a CEMP for the construction phase of the proposed development is treated an embedded mitigation measure, as are the provision of certain standard information and environmental management measures within the CEMP (refer to Section 10.6). Over and above this, the assessment in this ES chapter has identified the need for the following further mitigation measures to also be detailed within and implemented through the CEMP.
	Any construction activities within a 5m strip along waterfronts will be subject to specific consideration within the CEMP to be agreed with the National Park Authority (NPA) prior to commencement.
	An Environmental Clerk of Works (ECoW) will ensure that the CEMP and associated mitigation measures are implemented effectively.
	A pollution prevention and response plan will be set out in the CEMP. This will provide site spill response procedures, emergency contact details and equipment inventories and their location. All staff will be made aware of this document and its content during site induction. A copy will be available in the site office at all times.
	Surface Water Management.
	Surface water drainage arrangements for the construction phase will be in line with SUDs principles, incorporating appropriate treatment and attenuation prior to discharge to the water environment in accordance with the required CAR authorisation and relevant GBR. It is proposed to replicate natural drainage around construction areas and to use source control to manage rainfall where, or adjacent to where, it lands.
	The implementation of a given SUDs measure will be dependent upon detailed site and hydrological investigations. Detailed surface water drainage proposals and methodology for the construction phase will be detailed within a Pollution Prevention Plan (PPP) which will be included within the CEMP as noted above. The SUDs features will be installed prior to the main construction activities (including removal of vegetation and any earthworks). Suitable measures will be in place at all times for treatment of runoff from construction areas, to prevent the release of pollutants including sediment to adjacent surface water features.

EIAR Chapter and Topic	Proposed Further Mitigation and Enhancement Measures
	Clean runoff from vegetated areas or offsite will be kept clean and diverted around works to prevent mixing with silt-laden water.
	Surface water management measures employed during the construction phase should be regularly inspected and maintained to check that they are working effectively and that there are no blockages or unexpected discharges.
	The risk of oil contamination will be minimised by good site working practice (further described below) but should a higher risk of oil contamination be identified then an oil separator will be considered.
	A minimum buffer zone of 5m will be maintained along the waterfronts. No construction activities will take place within this buffer zone, including movement of construction machinery, stockpiling and construction of SUDs features unless they have been specifically considered and allowed within the CEMP.
	Routing of construction discharges should ideally be through at least three levels of SUDs to ensure that water quality of high sensitivity receptors is not adversely affected.
	Earthworks
	Areas stripped of earth and vegetation will be kept to a minimum at any one time – this is in accordance with the GBR11 of CAR. Soil loss and erosion will be minimised through careful storage, reinstatement and re-vegetation. Stockpiles will be placed in areas of minimal risk of slippage or erosion from drainage and will not be located within 20m of any watercourses or ditches.
	Any runoff from earthworks and stockpiles will be passed through appropriate construction SUDs measures prior to discharge to the water environment.
	The time excavations are kept open for will be kept to a minimum to avoid ingress of water, minimise erosion and the need for dewatering. Drainage or pumping from excavations will be minimised through appropriate design. Temporary cut-off drains will be installed if required to prevent surface water runoff entering excavations.
	Any dewatering will comply with GBR2 and GBR5. If abstraction exceeds 10m3 per day a CAR registration or licence will be required, which will be obtained prior to the commencement of the abstraction. Any water pumped out of excavations will be treated by passing through a SUDs feature prior to discharge to the water environment.
	Construction Tracks
	Access tracks used during construction (i.e. not the final road layout) will incorporate appropriate drainage measures including ditches, camber to shed water to the edges, frequent cross drains and trackside grips/offlets to prevent the tracks acting as a preferential drainage route and to protect the water environment. Any trackside discharge will be passed through appropriate construction SUDs measures prior to discharge to the water environment. Water will not be allowed or encouraged to pond in the track where possible.
	Oils, Fuels, Site Vehicles and Welfare Facilities
	The mitigation measures to minimise risk of contaminant release will be in line with the updated Controlled Activities (Scotland) Regulations which came into force on 1st January 2018. These new General Binding Rules (GBRs) consolidate the provisions of the Water Environment (Oil Storage) (Scotland) Regulations 2006 into CAR and extend the application of those provisions. The relevant PPGs will also be used to guide the embedded mitigation. This includes the following:

EIAR Chapter and Topic	Proposed Further Mitigation and Enhancement Measures
	Storage of oil and fuels on site will be designed to be compliant with GBRs 26-28 and any bunds will provide storage of at least 110% of the largest tank's maximum capacity: ▪ The storage of oil in a portable container with a capacity of greater than 200 litres on site will not be permitted; ▪ Multiple spill kits will be kept on site; ▪ Drip trays will be used while refuelling; and, ▪ Regular inspection and maintenance of vehicles, tanks and bunds will be undertaken.
	Welfare facilities will include closed-system toilets, with disposal of foul drainage at a suitable off-site facility.
	Concrete and cement mixing should be sited on an impermeable designated area and at least 10m away from a watercourse or surface water drain, to reduce the risk of run-off entering a watercourse. Equipment will be washed out in a designated area, specifically designed to contain wet concrete and wash water. Wash waters should be discharged to the foul sewer with prior permission from Scottish Water or disposed off-site at an authorised facility.
	All chemicals and hazardous substances will be stored safely, away from watercourses and drains in line with current best practice. They should be disposed of in line with duty of care requirements.
	Operational Phase
	The proposed surface water and SUDs scheme (see Section 10.6) will require regular maintenance. This maintenance will include the regular debris clearing and cutting of grass of surface SUD features, and the inspection and repairs to underground features if necessary. The responsibility for the maintenance of the drainage network will lie with the organisation that adopts the network. Details of the proposed drainage strategy for the site are covered in **Appendix 10.3**.
	During the operational phase there should be no requirement for groundworks. However, should groundworks be required mitigation highlighted in the construction sections above will be adopted as appropriate.
Chapter 11 - LVIA	**Construction Phase**
	No further construction stage mitigation proposed.
	Operational Phase
	No additional operational stage mitigation proposed.
Chapter 12 – Traffic and Transport	**Construction Phase**
	Development and implementation of measures relating to: construction traffic routing, site access/deliveries, parking, contractor management, parking, fuels and materials storage, standard dust and noise suppression techniques and standard pollution presentation and control techniques. These measures will be set out within a Construction Environmental Management Plan (CEMP). Any construction activities within a 5m strip along waterfronts will be subject to specific consideration within a CEMP to be agreed with the LLTNPA prior to commencement.
	Adoption of standard construction industry working hours for noise generating activities.
	Operational Phase

EIAR Chapter and Topic	Proposed Further Mitigation and Enhancement Measures
	An Outline Travel Plan: Contained within the Transport Assessment an Outline Travel Plan incorporates actions and incentives and an ongoing programme of delivering sustainable travel options for the proposed development site. This includes several potential measures which could be implemented to support sustainable travel choices for future employees, through both induction processes and provision of a travel information pack for new starts. Users of the holiday accommodation will receive travel plan options on booking and arrival.
	Monorail: A monorail is incorporated in to the development proposals to provide better connectivity between Zone A (Station Square) and Zone C (Pierhead). This will provide better connectivity between Balloch Village and Loch Lomond Shores, through provision of a safe, direct and convenient means of transport. During the winter months/ dark nights the existing Pier Road and walking routes adjacent to the River Leven (Riverfront area) are not conducive to walking as function of reduced personal security, and the overall distance. As such, the monorail will help support an evening economy at the existing and with-development scenarios.
	Public Transport: The WDC plans for the Station Square enhancements on Balloch Road between the proposed new Station Square development (Zone A) and Balloch Railway Station, will help deliver enhanced access between the station and the proposed development site as well as the wider village of Balloch. It is also understood that revised parking arrangements are being considered for Balloch Rail Station as part of the wider "Balloch Village Parking Proposals" which are hoped to alleviate parking issues in the locality as well as encourage an uptake in rail usage; Discussions have been undertaken with ScotRail to seek to agree in principle the mutual benefits of promoting access to the development site by rail. Whilst any interventions are still in early developmental stages, these are presently anticipated to include: ▪ Shared-ticketing: whereby rail and attraction-tickets can be purchased simultaneously, incorporating some form of discount for the passenger/ visitor; ▪ The opportunity to promote the new West Riverside development as a destination, where branding/ wrapping the trains can be used as a marketing/ promotional incentive; and, ▪ The potential for further studies into the need for enhanced rail services either by frequency and/ or selective station stopping to improve journey times.
	Lodge Parking: For accommodation land uses, except for the Woodbank House site, the arrivals and parking for this element can be managed from the point of booking, whereby visitors can be advised of the intended arrival and check-in arrangements. The intention is that accommodation-based-visitors and associated parking will be segregated from other land-uses and that parking will be provided remotely from the accommodation. Small buggies will be used to transport visitors and baggage to their holiday accommodation. This will reduce both unnecessary vehicular circulation at arrival and departure times but is also expected to reduce the use of cars for short-trips by guests throughout their stay: it will be more convenient to walk, cycle or use the mono-rail for shorter local and site-internal trips.
Chapter 13 – Archaeology & Cultural Heritage	**Construction Phase**
	Preferred mitigation option in to avoid or reduce impacts through design, or through precautionary measures such as fencing off heritage assets during construction works.
	A Conservation Management Plan will be produced by a suitably experienced historic buildings professional in consultation with HES.
	In terms of archaeology, an Archaeological Written Scheme of Investigation (WSI) will be produced and agreed with WoSAS.

EIAR Chapter and Topic	Proposed Further Mitigation and Enhancement Measures
	A programme of historic building recording (HBR) will be undertaken in connection with Woodbank House and its associated structures and estate grounds.
	The results of the HBR work will be used to inform the design of a flexible approach to the preservation of remaining facades of Woodbank House and restoration where viable of associated listed structures.
	Conservation work will pay particular attention to the east and south facades of Woodbank House, and their presentation as a landmark feature within the proposed development.
	Operational Phase
	The results of the EIA, HBR and conservation work will also be used to inform the production of interpretive materials for public dissemination. Such materials could take the form of information panels and/or a heritage trail around the grounds of Woodbank House describing and illustrating the history of the house and estate, whilst also providing information on the preservation and renovation process.
Chapter 14 - Socio-Economics, Tourism, Recreation and Public Access	**Construction Phase**
	None required.
	Operational Phase
	None Required.

17 Glossary

Abbreviations	Meaning
AADT	Annual Average Daily Traffic
AAWT	Average Annual Weekday Traffic
ADMS	Air Dispersion Modelling System
ALC	Agricultural Land Classification
AMSC	Associated Matters Specified by Condition
AOD	Above Ordnance Data
APIS	Air Pollution Information System
AQAP	Air Quality Action Plan
AQMA	Air Quality Management Area
BGS	British Geological Survey
BMV	Best and Most Versatile (agricultural land)
BRE	Building Research Establishment
BS	British Standards
BS	British Standard
BSI	British Standards Institute
CAMS	Catchment Abstraction Management Strategy
CDM	Construction Design and Management
CEMP	Construction Environmental Management Plan
CFMP	Catchment Flood Management Plan
CLEA	Contaminated Land Exposure Assessment
CLR	Contaminated Land Report
CMP	Construction Management Plan
CoPA	Control of Pollution Act
CRN	Calculation of Railway Noise
CROW	Countryside and Rights of Way
CRTN	Calculation of Road Traffic Noise
CSM	Conceptual Site Model
CTMP	Construction Traffic Management Plan
CTMS	Construction Traffic Management Scheme
CP	Compensatory Planting
dB	Decibel Level
dBA	A-Weighted Decibel Level
DCLG	Department for Communities and Local Government
DEFRA	Department for Environment, Food and Rural Affairs
DfT	Department for Transport
DIA	Drainage Impact Assessment
DMRB	Design Manual for Roads and Bridges
DOE	Department of Environment

Abbreviations	Meaning
EC	European Commission
EFT	Emission Factor Toolkit
EHO	Environmental Health Officer
EIA	Environmental Impact Assessment
EIAR	Environmental Impact Assessment Report
EPA	Environmental Protection Act
EPUK	Environmental Protection UK
EU	European Union
FEH	Flood Estimation Handbook
FLS	Forestry and Land Scotland
FMP	Flood Modeller Pro Software
FRA	Flood Risk Assessment
HDV	Heavy Duty Vehicle; a vehicle with a gross vehicle weight greater than 3.5 tonnes. Includes Heavy Goods Vehicles and buses
HEP	Historic Environment Policy
HES	Historic Environment Scotland
HLA	Historic Land-Use Assessment
HMSO	Her Majesty's Stationary Office
IAQM	Institute of Air Quality Management
IEMA	Institute of Environmental Management and Assessment
ISO	International Standards Organisation
LAQM	Local Air Quality Management
LBC	Listed Building Consent
LDP	Local Development Plan
LFRMS	Local Flood Risk Management Strategy
LIDAR	Light Detection and Ranging
LLTNP	Loch Lomond & The Trossachs National Park
LLNTPA	Loch Lomond & The Trossachs National Park Authority
LGS	Local Geological Sites
LFA	Local Flood Authority
LOAEL	Lowest Observed Adverse Effect Level
LPA	Local Planning Authority
NAQO	National Air Quality Objective as set out in the Air Quality Strategy and the Air Quality Regulations
NGD	Noise Generating Development
NNR	National Nature Reserve
NO_2	Nitrogen Dioxide
NOEL	No Observed Effect Level
NO_x	Nitrogen oxides, generally considered to be nitric oxide and NO_2. Its main source is from combustion of fossil fuels, including petrol and diesel used in road vehicles
NPF	National Planning Framework

Abbreviations	Meaning
NSD	Noise Sensitive Development
NSR	Noise Sensitive Receptor
OS	Ordnance Survey
PAC	Planning Application Consultation
PAN	Planning Advice Note
PAN	Proposal of Application Notice
PFRA	Preliminary Flood Risk Assessment
PG	Planning Guidance
$PM_{10}/PM_{2.5}$	Small airborne particles less than 10/2.5 μm in diameter
POM	Programme of Measures
PPiP	Planning Permission in Principle
PPV	Peak Particle Velocity
ProPG	Professional Practice Guidance on Planning and Noise
PSC	Potential source of contamination
RBMP	River Basin Management Plan
SEL	Single Event Level
SEPA	Scottish Environment Protection Agency
SFRA	Strategic Flood Risk Assessment
SG	Supplementary Guidance
SOAEL	Significant Observed Adverse Effect Level
SPP	Scottish Planning Policy
SPZ	Source Protection Zone
SSSI	Site of Special Scientific Interest
SUDs	Sustainable Urban Drainage systems
UNECE	United Nations Economic Commission for Europe
VDV	Vibration Dose Value
VMS	Variable Message Signing
WDC	West Dunbartonshire Council
WFD	Water Framework Directive
WHO	World Health Organisation
WSAS	West of Scotland Archaeological Services
ZTV	Zone of Theoretical Visibility

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