

Havant Thicket Reservoir

Environmental Statement Addendum

Client: Future Water (for Portsmouth Water)

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Document History

Rev	Date	Updates	Originator	Checker	Reviewer	Future Water Approver
01	17/04/2024	Final	Environmental specialists	AH	EM	JH

List of Abbreviations

Abbreviation	Description
AMP	Archaeological Management Plan
AOD	Above Ordnance Datum
AQMA	Air Quality Management Area
AQS	Air Quality Strategy
AURN	Automatic and Rural Network
BS	British Standard
BSI	British Standards Institution
CDE	Construction, Demolition & Excavation
CEMP	Construction Environmental Management Plan
CIEEM	Chartered Institute for Ecology and Environmental Management
CMS	Continuous Monitoring Site
CTMP	Construction Traffic Management Plan
DESNZ	Department for Energy Security and Net Zero
DfT	Department for Transport
EEA	European Environment Agency
EHDC	East Hampshire District Council
EIA	Environmental Impact Assessment
EMEP	European Monitoring and Evaluation Programme
EPD	Environmental Product Declaration
ES	Environmental Statement
FRA	Flood Risk Assessment
GHG	Greenhouse Gas
GPA	Good Practice Advice
HBC	Havant Borough Council
HGV	Heavy Goods Vehicle
HHER	Hampshire Historic Environment Record
IAQM	Institute of Air Quality Management
ICE	Inventory of Carbon and Energy
IEMA	Institute of Environmental Management and Assessment
JSNA	Joint Strategic Needs Assessment
LAQM	Local Air Quality Management
LCA	Landscape Character Areas
LCWIP	Local Cycling and Walking Plan
LR	Landscape Receptor

Abbreviation	Description
LTP	Local Transport Plan
MMP	Materials Management Plan
NHLE	National Heritage List for England
NPPF	National Planning Policy Framework
NPPG	National Planning Practice Guidance
NPSWRI	National Policy Statement for Water Resources Infrastructure
NRMM	Non-Road Mobile Machinery
NSIP	Nationally Significant Infrastructure Project
NTS	Non-Technical Summary
OEMP	Outline Environmental Management Plan
OTP	Observation Test Pits
PAH	Polycyclic Aromatic Hydrocarbon
PBDE	Polybrominated Diphenyl Ethers
PFOS	Perfluorooctane Sulfonate
PIC	Public Interest Commitment
PM	Particulate Matter
PPG	Planning Practice Guidance
REAC	Record of Environmental and Actions Commitments
RNAG	Reason for Not Achieving Good
RPG	Registered Park and Garden
S73	Section 73
SAC	Special Area of Conservation
SCPCAHG	Staunton Country Park Community Archaeology and Heritage Group
SPA	Special Protection Area
SWMP	Site Waste Management Plan
TA	Transport Assessment
TP	Travel Plan
TWL	Top Water Level
UKCP	United Kingdom Climate Projection
VR	Visual Receptor
WFD	Water Framework Directive
WRMP	Water Resources Management Plan
WSI	Written Scheme of Investigation
ZoI	Zone of Influence

Glossary of Terminology

Term	Definition
2020 ES	The Environmental Statement published in 2020 to support the hybrid planning application for Havant Thicket Reservoir.
Addendum to the Environmental Statement	Describes the changes to the Havant Thicket Reservoir Scheme and examines whether the changes give rise to new, or different significant environmental effects on those topics assessed in the 2020 ES.
AQMA	Air Quality Management Area – An area identified where the National Air Quality Objectives are not likely to be achieved. The Local Authority is required to produce a Local Air Quality Action Plan to plan how air quality in the area is to be improved.
AQS	Air Quality Strategy – The AQS sets out air quality objectives and policy options to further improve air quality in the UK from today into the long term.
Baseline	Also referred to as the 'baseline situation', this term describes the existing nature of the landscape and the visual environment within the study area at a fixed point in time, as well as any changes likely to occur independently of the proposed development, including the legislative and planning context and any relevant published guidance.
CEMP	Construction Environmental Management Plan - A plan by the contractor describing how the environmental impacts of construction activities of a project will be minimised and mitigated.
CMS	Continuous Monitoring Stations - An air quality monitoring station that houses analysers that continuously monitor the concentrations of air pollutants.
Construction	Construction, also referred to as the construction phase, refers to the all activity on and offsite required to implement the proposed development. The construction phase is considered to commence with the first activity on site, for example the creation of site access or site clearance works, and ends with demobilisation.
Conservation Area	An area of special environmental or historic interest or importance, of which the character or appearance is protected by law against undesirable changes (Section 69 of the Planning (Listed Buildings and Conservation Areas) Act 1990).
Defra	Department of the Environment, Food and Rural Affairs - Defra is the government department responsible for environmental protection, food production and standards, agriculture, fisheries and rural communities in the United Kingdom of Great Britain and Northern Ireland. Defra is a ministerial department, supported by 33 agencies and public bodies.
Demobilisation	This term refers to the completion and the removal of physical and manpower resources from a construction site at the completion of the construction phase.
Development	Any proposal that results in a change to the landscape and / or visual environment.
DfT	Department for Transport - Government department responsible for the transport network in England, and for aspects of the transport network in the devolved administrations.
Disasters	A sudden accident or a natural catastrophe that causes great damage or loss of life.
EA	Environment Agency - A non-departmental public body with responsibilities relating to the protection and enhancement of the environment in England.
English Heritage	Charity that cares for the National Heritage Collection of state owned historic sites and monuments across England, under licence from Historic England.

Term	Definition
Effect	The nature of the change(s) likely to occur as a result of a particular impact.
Direct effect	An effect that is directly attributable to the Scheme
Indirect effect	An effect that results from the Scheme as a consequence of a direct effect(s), often occurring away from the site, or as a result of a sequence of interrelationships or a complex pathway.
Element	Individual parts which make up the landscape, for example trees, hedgerows or buildings.
Enabling works	Enabling works cover those activities and preparations required to make a site construction ready and include the creation of access routes, and installation of security fencing, hoarding, signage and site compound(s). Enabling works are considered to occur during the construction phase.
Enhancement	Measures that seek to improve the landscape of the site and / or its wider setting beyond its baseline condition.
Feature	Prominent or eye-catching elements in the landscape, such as wooded skylines, parkland trees, church spires, or a particular aspect of the proposed development.
Historic England	Publicly funded body that champions and protects England's historic places; also known as the Historic Buildings and Monuments Commission for England.
Land use	This term refers to what land is used for and is based on broad categories such as urban, industrial, agriculture or forestry.
Landform	The shape and form of the land surface resulting from combinations of geology, geomorphology, slope, elevation and physical processes.
Landscape character	A distinct, recognisable and consistent pattern of elements in the landscape that makes one landscape different from another, rather than better or worse.
Landscape Character Area (LCA)	Single unique areas which are discrete geographical areas of a particular landscape type.
Landscape receptor	The constituent features and elements of the landscape, its specific or perceptual qualities and its character considered in relation to the proposed development.
Magnitude of change	A judgement regarding the size and scale of the change, the geographical extent of the area that would be affected and the duration of the effect and its reversibility.
Mitigation	This term refers to those measures that are proposed to prevent/avoid, reduce and where possible offset any adverse effects.
NE	Natural England - Executive non-departmental public body responsible for the natural environment.
OEMP	The Outline EMP prepared as part of the 2020 ES set out the approach towards, and framework for, environmental management during the construction phase and mitigation against potentially adverse construction impacts on environmental receptors, local residents and businesses.
Operation	Also referred to as completion, this term describes the operation phase of the completed development and is considered to commence at the end of the construction phase, after demobilisation. The duration of the operation phase is dependent on the nature of the proposed development.

Term	Definition
Parameters	A limit or boundary which defines the scope of a particular process or activity.
Perception / perceptible	A term used to describe the sensory (i.e. received through human senses) with the cognitive (i.e. knowledge and understanding gained from many sources and experiences).
Permissive Paths	A path over which there is no formal right of access (i.e. not a public right of way) whose use by the public is allowed by the landowner.
PM ₁₀	Particulate Matter with a diameter of 10 micrometres or less
PM _{2.5}	Particulate Matter with a diameter of 2.5 micrometres or less
Scheduled monument	A 'nationally important' archaeological site or historic building, given protection against unauthorised change and included in the Schedule of Monuments kept by the Secretary of State for Culture, Media and Sport. The protection given to scheduled monuments is given under the Ancient Monuments and Archaeological Areas Act 1979.
Sensitivity (of a receptor)	A judgement regarding the susceptibility of a receptor to the change arising as a result of the proposed development and the value attached to the receptor.
Significance of effect	The level or importance of landscape and visual effects, determined by considering together sequentially the sensitivity of the receptor with the magnitude of effect.
SPA	Special Protection Area - Areas of strictly protected sites classified in accordance with Article 4 of the EC Birds Directive (2009/147/EC) on the conservation of wild birds. They are classified for rare and vulnerable birds (as listed on Annex I of the Directive), and for regularly occurring migratory species.
SSSI	Site of Special Scientific Interest - A conservation designation denoting to a protected area in the United Kingdom. The Sites are protected by law to conserve their wildlife or geology.
Stakeholder	The whole constituency of individuals and groups who have an interest in a subject, place or landscape.
Study area	The area within which it is considered that changes arising as a result of the proposed development would result in the highest and / or most important direct or indirect effects.
SWMP	Site Waste Management Plan - A Site Waste Management Plan should describe how materials will be managed efficiently and disposed of legally during the construction of the works, explaining how the re-use and recycling of materials will be maximised. This involves estimating how much of each type of waste is likely to be produced and the proportion of this that will be re-used or recycled on site, or removed from the construction site for re-use, recycling, recovery or disposal. It is the joint responsibility of the client and the principal contractor to ensure that a Site Waste Management Plan is in place before construction begins and to ensure that it is enforced.
Viewpoint	The location from which photographs that describe specific or representative views toward the proposed development are captured.
Visual amenity	The overall pleasantness of the views people enjoy of their surroundings, which provides the setting or backdrop for the enjoyment of peoples activities.
Visual receptor	Individuals and / or defined groups of people who have the potential to be affected by the proposed development.

Term	Definition
WFD	Water Framework Directive - The Water Framework Directive (2000/60/EC) is a EU directive which aims to achieve good (2000/60/EC) is a EU directive which aims to achieve good status of all water bodies (surface waters, groundwaters and the sites that depend on them, estuaries and near-shore coastal waters) and the prevent any deterioration. It has introduced a comprehensive river basin management planning system to protect and improve the ecological quality of the water environment. It is underpinned by the use of environmental standards.
Worst-case	Reasonable prediction of the scenario that would result in the highest level of effect(s).
Vulnerability	The quality or state of being exposed to the possibility of being attacked or harmed, either physically or emotionally.
Zone of Theoretical Visibility	A map, usually digitally produced, showing areas of land within which, a development is theoretically visible.

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List of Contributors

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Chapter 2	Changes to the Scheme	Royal HaskoningDHV/Future Water
Chapter 3	Consultation	Royal HaskoningDHV/Future Water
Chapter 4	EIA Process, Approach and Methodology	Royal HaskoningDHV/Future Water
Chapter 5	Scoping	Royal HaskoningDHV/Future Water
Chapter 6	Air Quality	Royal HaskoningDHV/Future Water
Chapter 7	Historic Environment	Royal HaskoningDHV/Future Water
Chapter 8	Biodiversity	Royal HaskoningDHV/Future Water
Chapter 9	Ground Conditions	Royal HaskoningDHV/Future Water
Chapter 10	Landscape and Visual	Royal HaskoningDHV/ Future Water/Portsmouth Water
Chapter 11	Noise and Vibration	Royal HaskoningDHV/Future Water
Chapter 12	Traffic and Transport	Royal HaskoningDHV/Future Water
Chapter 13	Material Resources and Waste	Royal HaskoningDHV/Future Water
Chapter 14	Water	Royal HaskoningDHV/Future Water
Chapter 15	Effect on Climate	Royal HaskoningDHV/Future Water
Chapter 16	Vulnerability to Climate Change	Royal HaskoningDHV/Future Water
Chapter 17	Population and Human Health	Royal HaskoningDHV/Future Water
Chapter 18	Cumulative and In-Combination Effects	Royal HaskoningDHV/Future Water
Chapter 19	Conclusion	Royal HaskoningDHV/Future Water

1 Introduction

1.1 Background

- 1.1.1 The Havant Thicket Reservoir (herein referred to as 'the Scheme') is being developed by Portsmouth Water to provide a new resource to supply drinking water in the South East of England, while maximising the community and environmental benefits of a new raw water reservoir. The Scheme comprises a reservoir for water storage and access routes, with a control house, visitor centre and car park, recreational facilities for public amenity and a wetland along the northern shore of the reservoir. The reservoir site (herein referred to as "the Site") lies within two local planning authorities, Havant Borough Council (HBC) and East Hampshire District Council (EHDC), within the county of Hampshire.
- 1.1.2 An Environmental Statement (ES) (herein referred to as 'the 2020 ES') and the accompanying Non-Technical Summary (NTS) (herein referred to as 'the 2020 NTS') was submitted for the Scheme in 2020, as part of the hybrid planning application¹ for the reservoir (the Scheme) and the separate outline planning application for a pipeline to transfer water between the reservoir and Bedhampton springs, in accordance with the Town and Country (Environmental Impact Assessment) Regulations 2017 ('the Environmental Impact Assessment (EIA) Regulations')². The 2020 ES presented the results of the environmental assessments undertaken to inform decision making and the Scheme design.
- 1.1.3 The Scheme was granted planning permission subject to conditions in October 2021, by HBC and EHDC under Planning Application Refs: APP/20/00990 and 51680/001 respectively. The consent is a hybrid planning permission and includes full planning permission for some matters and outline planning permissions for others.
- 1.1.4 Changes to the approved Scheme are proposed as part of this Section 73 (S73) application, and this ES Addendum considers the implications of those changes as set out below.

¹ Havant Thicket Reservoir planning application – Havant Borough Council [Planning application](#) and East Hampshire District Council [Planning Application](#)

² <https://www.legislation.gov.uk/uksi/2017/571/contents/made>

1.2 Scheme Overview

- 1.2.1 The Scheme, when constructed, will provide water supplies to Portsmouth Water customers in the summer months, as required. The increase in water supplies available to Portsmouth Water on completion of the Scheme will enable additional water to be supplied from Portsmouth Water to Southern Water. Complementary to its infrastructure resilience function, the reservoir will provide a new recreational facility/resource adjacent to one of the more deprived areas in southeast Hampshire, in an area which the community can access on foot, by bike, or through existing bus routes. It offers further opportunities to improve the wider footpath, cycleway and bridleway networks in the area. More than 29,500 people live within reasonable walking distance of the Site (1.5 km) and 120,000 people live within reasonable cycling distance of the Site (4.5 km).
- 1.2.2 The Scheme includes the reservoir at Havant Thicket, as well as habitat mitigation and footpaths. A new wetland habitat and associated area for nature conservation will also be provided.

1.3 Overseeing Organisation

- 1.3.1 The organisation responsible for the project is Portsmouth Water. Portsmouth Water is an independent water company supplying clean drinking water to an area that covers 868 km².

The Designer and Principal Contractor

- 1.3.2 Atkins Ltd was appointed to undertake the provision of design services to support the hybrid planning application, which included responsibility for the preparation of the 2020 ES. A planning decision for the Scheme was obtained in October 2021.
- 1.3.3 In 2023, Portsmouth Water appointed Future Water as Principal Contractor and Principal Designer for the design and construction of the main reservoir works, but excluding the pipeline connecting the reservoir to Bedhampton Springs at the Bedhampton pumping station and ancillary buildings for which a separate Principal Contractor and Principal Designer has been appointed by Portsmouth Water.

1.4 Need for Environmental Impact Assessment

- 1.4.1 Information on the need for an EIA is presented in the 2020 ES Chapter 1: Introduction (Vol 2 Main Report Chapters 1-6; Document Reference: HTR-ATK-ZZ-ZZ-RP-Z-0101).
- 1.4.2 The changes to the Scheme presented in **Chapter 2: Changes to the Scheme** are being made under Section 73 of the Planning Act 1990. An S73 application is considered to be a new application for planning permission under the EIA Regulations.

- 1.4.3 Whether changes to the 2020 ES are required or not, an ES must be submitted with a S73 application for a development which the local planning authority considers to be EIA development.

1.5 Purpose of the Environmental Statement Addendum

- 1.5.1 The requirement for EIA is established by the European Directive 2011/92/EU (codifying previous EIA Directives), as amended by 2014/52/EU on the assessment of the effects of certain public and private projects on the environment (the EIA Directive). The EIA Directive is implemented via various regulations; in this instance, The Town and Country Planning (Environmental Impact Assessment) Regulations 2017.
- 1.5.2 The S73 applications now submitted are supported by an Environmental Statement Addendum (April 2024) (ES Addendum) which reports the findings of the Environmental Impact Assessment (EIA) considering the proposed amendments to the main embankment, culvert and valve tower and whether there are any changes to the conclusions of the 2020 ES. The EIA process for the ES Addendum is based on the parameters approach for a range of elements as set out in the Section 73 Development Specification (April 2024). The parameters set out in this report are also set out and described in Section 2 'Description of the Proposed Changes' in the Planning Statement.
- 1.5.3 Royal HaskoningDHV was appointed by Future Water to undertake the EIA and the preparation of the addendum to the ES (herein referred to as 'the ES Addendum') for the proposed changes to the Scheme (see **Chapter 2: Changes to the Scheme**). The changes include amendments to the alignment and design of the main embankment to reduce the slopes, resulting in a larger footprint. This would also result in changes to the position of the crest line of the main embankment. As a consequence of the amendments to the main embankment, the reservoir culvert would be lengthened. The reservoir valve tower would be relocated outside the inner core of the main embankment.
- 1.5.4 The purpose of the ES Addendum is to describe the proposed changes to the Scheme since the publication of the 2020 ES and present an assessment of any new or different significant effects that could result from these changes. The Scheme as described in this ES Addendum relates to the main reservoir works site only and excludes the pipeline connecting the reservoir to Bedhampton Springs at the Bedhampton pumping station, as no changes are proposed to this element of the original hybrid planning permission as part of this S73 application.

- 1.5.5 The ES Addendum considers any changes to legislation, policy and guidelines used in the assessment process, and whether the environmental impact assessment presented in the 2020 ES would need to be updated to take into consideration the proposed Scheme changes. If no change is described, then the information remains the same as that presented in the 2020 ES (refer to paragraph 3.2.7).
- 1.5.6 To accord with the requirements of the EIA Regulations, the ES Addendum to the 2020 ES will be submitted as part of the S73 application.

1.6 Legislative and Policy Framework

- 1.6.1 The EIA has been undertaken in accordance with the following:
- The statutory requirement for EIA is set out in Directive 85/337/EEC as amended by Directive 2014/52/EU, which codifies all previous amendments including Article 3 of Directive 2003/35/EC;
 - The Town and Country Planning EIA Regulations 2017;
 - Environmental Impact Assessment Guidance (Ministry of Housing, Communities and Local Government) which explains the requirements of the EIA Regulations; and
 - Legislation, policies and guidance relevant to the environmental topics being assessed.

1.7 National Planning Policy Framework

- 1.7.1 The National Planning Policy Framework (NPPF)³, last updated December 2023, sets out the Government's planning policies for England and how these should be applied. It provides a framework within which locally prepared plans for housing and other development can be produced. It is also a material consideration in planning decisions.
- 1.7.2 NPPF (Paragraph 20 (b)) identifies infrastructure for water supply as a strategic policy matter for which policies should look ahead over a minimum 15-year period. Paragraphs 24 to 26 require cross-boundary collaboration on strategic policy matters.
- 1.7.3 Paragraph 186 provides guidance to Local Planning Authorities in determining applications which have impacts on habitats and biodiversity.

³ [National Planning Policy Framework \(publishing.service.gov.uk\)](https://www.gov.uk/publishing.service.gov.uk)

- 1.7.4 With regard to loss or deterioration of irreplaceable habitats including ancient woodland and Veteran Trees, applications for permission should be refused unless “*there are wholly exceptional reasons and a suitable compensation strategy exists*” (Paragraph 186 (c)). Exceptional reasons include “*infrastructure projects... where the public benefit would clearly outweigh the loss or deterioration of habitat*”.
- 1.7.5 The NPPF (Paragraph 206) advises that “*Any harm to, or loss of, the significance of a designated heritage asset (from its alteration or destruction, or from development within its setting), should require clear and convincing justification*”. Paragraph 208 states that: “*where a development proposal will lead to less than substantial harm to the significance of a designated heritage asset, this harm should be weighed against the public benefits of the proposal including, where appropriate, securing its optimum viable use*”.
- 1.7.6 A more comprehensive assessment of the relevant paragraphs of the NPPF to the S73 application is provided in the Planning Statement.

1.8 National Policy Statement for Water Resources Infrastructure

- 1.8.1 The National Policy Statement for Water Resources Infrastructure⁴ (NPSWRI) was published in April 2023. This document sets out the need and Government’s policies for the development of Nationally Significant Infrastructure Projects (NSIPs) for water resources in England. Whilst the Scheme is not an NSIP, paragraph 1.1.10 of the NPSWRI clarifies that it may also be a material consideration informing decisions on planning applications relating to water resources.

1.9 Revised Draft Portsmouth Water Resource Management Plan

- 1.9.1 The ES Addendum takes into consideration the Revised Draft Portsmouth Water Resources Management Plan⁵ (WRMP) 2024 (published August 2023) for the next 50 years (2025-2075). The approval of the Scheme will enable Portsmouth Water to make a major contribution to long-term resilient water resources development in the South East of England.

1.10 Core Strategies and Local Plans

- 1.10.1 The Site is divided along a north-south alignment between the two local planning authorities of HBC and EHDC, both within Hampshire County Council. Consideration of the Scheme is therefore required in relation to the following environmental policies:

⁴ [National Policy Statement for Water Resources Infrastructure \(publishing.service.gov.uk\)](https://publishing.service.gov.uk)

⁵ [Title Page \(portsmouthwater.co.uk\)](https://portsmouthwater.co.uk)

- Havant Borough Council Local Plan, made up of the Core Strategy⁶ adopted in 2011 and the Site Allocations Plan⁷ adopted in 2014;
- Adopted Local Plan for East Hampshire District Council as Joint Core Strategy⁸ adopted in 2014;
- Hampshire Minerals and Waste Plan (2013)⁹; and
- Emsworth Neighbourhood Plan (2021)¹⁰.

1.10.2 EHDC recently published a new Regulation 18 draft Local Plan 2021-2040 for consultation on Monday 22nd January 2024, which also has the potential to be a consideration. Paragraph 48 of the NPPF notes that local planning authorities may give weight to relevant policies in emerging plans according to the stage or preparation of the emerging plan and the extent to which there are unresolved objections to relevant policies. In view of the early stage in the preparation process of the draft EHDC local plan, it is considered that these draft plans can be afforded limited weight in the decision-making process.

1.10.3 The South Downs Local Plan (2019) is also a relevant consideration as, while the development is not located in the National Park, it lies adjacent to its boundary which runs along the B2149 Manor Lodge Road.

1.11 Competent Experts

1.11.1 In accordance with the EIA Regulations, the coordination of the environmental assessment process and specialist assessments have been undertaken by a team of competent and qualified consultants, who are registered with the relevant institutions and/or chartered. Royal HaskoningDHV is EIA Quality Mark Registered through the Institute of Environmental Management and Assessment (IEMA). Accreditation is based around compliance with a series of EIA commitments which IEMA regularly independently monitors through an annual review process. The EIA Quality Mark therefore provides registrants with a benchmark for their EIA activities and demonstrates a commitment to effective practice. Continued registration requires Royal HaskoningDHV coordinators and practitioners to be aware of the commitments and deliver EIA to a high standard.

⁶ <https://www.havant.gov.uk/media/7437/download?inline>

⁷ <https://www.havant.gov.uk/media/7687/download?inline>

⁸ <https://www.easthants.gov.uk/media/5462/download?inline>

⁹ <https://documents.hants.gov.uk/mineralsandwaste/HampshireMineralsWastePlanADOPTED.pdf>

¹⁰ <https://www.havant.gov.uk/media/8386/download?inline>

1.12 Structure of the ES Addendum

1.12.1 The ES Addendum is structured as follows:

- **Chapter 1: Introduction** – provides a brief background to the Scheme, competent expertise used to undertake the environmental assessments, and the purpose and structure of the ES Addendum;
- **Chapter 2: Changes to the Scheme** – presents a description of the changes to the Scheme since publication of the 2020 ES;
- **Chapter 3: EIA Process, Approach and Methodology** – provides an overview to EIA process;
- **Chapter 4: Scoping** – provides an overview of the scoping exercise undertaken to identify whether there would likely to be any new or materially different significant effects on the environment arising from the Scheme changes;
- **Chapter 5: Consultation** – provides a summary of the consultation undertaken on the Scheme changes;
- **Chapters 6 to 18** – present updates to the environmental assessments presented in the 2020 ES;
- **Chapter 19: Conclusion** – provides a summary of the residual effects of the Scheme changes;
- **Appendices** – including updated photo visualisations supporting the ES Addendum; and
- **NTS** – an NTS accompanies the ES Addendum and provides a summary of the ES Addendum in non-technical language.

1.13 Scope of the ES Addendum

1.13.1 A scoping exercise was carried out to identify whether there are likely to be any new or materially different significant effects on the environment arising from the proposed changes to the Scheme, with reference to the topic assessments presented within the 2020 ES, and is presented in **Chapter 4: Scoping** of the ES Addendum.

2 Changes to the Scheme

2.1 Introduction

- 2.1.1 This chapter of the ES Addendum presents a description of the proposed changes to the Scheme.
- 2.1.2 The site location is presented in the 2020 ES Chapter 2: Description of the Development (Vol 2 Chapters 1-6; Document Reference: HTR-ATK-ZZ-ZZ-RP-Z-0101). The main reservoir works are located within the planning application boundary presented in the 2020 ES Figure 2.1: Site Location (Vol 3 Chapters 1 and 2; Drawing Reference: HTR-ATK-ZZ-ZZ-GS-Z-0143). The planning application boundary does not change as part of the S73 application.
- 2.1.3 The pipeline connecting the reservoir to Bedhampton Springs at the Bedhampton pumping station is not considered within the ES Addendum as no changes are proposed to this element of the original hybrid planning permission as part of the S73 application.

2.2 Description of Scheme Changes

- 2.2.1 A description of the proposed changes to the Scheme are presented in the sections below.
- 2.2.2 The proposed changes to the Scheme are shown on the following drawings set out in **Table 2-1**.
- 2.2.3 The elements of the S73 applications that are proposed as outline and full planning permission are shown on drawing HTR-GHD-ZZ-ZZ-DR-T-0021 Planning Application Strategy Key Plan.

Table 2-1: Drawings of the Scheme

Approved Drawings	Proposed Drawings
HTR-ATK-ZZ-ZZ-DR-L-0006 FIGURE 4 PLANNING APPLICATION STRATEGY KEY PLAN	HTR-GHD-ZZ-ZZ-DR-T-0021 PLANNING STRATEGY KEY PLAN
HTR-FUW-XX-RE-DR-T-0001 OUTLINE MASTERPLAN	HTR-GHD-ZZ-ZZ-DR-T-0001 RESERVOIR OUTLINE MASTERPLAN
HTR-ATK-ZZ-ZZ-DR-L-0012 LANDSCAPE PLAN - CONTROL HOUSE	HTR-GHD-ZZ-ZZ-DR-T-0004 LANDSCAPE PLAN CONTROL HOUSE
HTR-ATK-ZZ-ZZ-DR-L-0013 LANDSCAPE PLAN – STAIRCASE	HTR-GHD-ZZ-ZZ-DR-T-0005 LANDSCAPE PLAN AVENUE STAIRCASE
HTR-ATK-ZZ-ZZ-DR-L-0014 LANDSCAPE PLAN - GIPSIES_PLAIN	HTR-GHD-ZZ-ZZ-DR-T-0006 LANDSCAPE PLAN GIPSIES PLAIN
HTR-ATK-ZZ-ZZ-DR-L-0016 LANDSCAPE PLAN - VIEWING PLATFORM	HTR-GHD-ZZ-ZZ-DR-T-0007 LANDSCAPE PLAN VIEWING PLATFORM
HTR-ATK-ZZ-ZZ-DR-L-00018 SECTION A	HTR-GHD-ZZ-ZZ-DR-T-0008 MAIN EMBANKMENT SECTION A
HTR-ATK-ZZ-ZZ-DR-L-00019	HTR-GHD-ZZ-ZZ-DR-T-0009

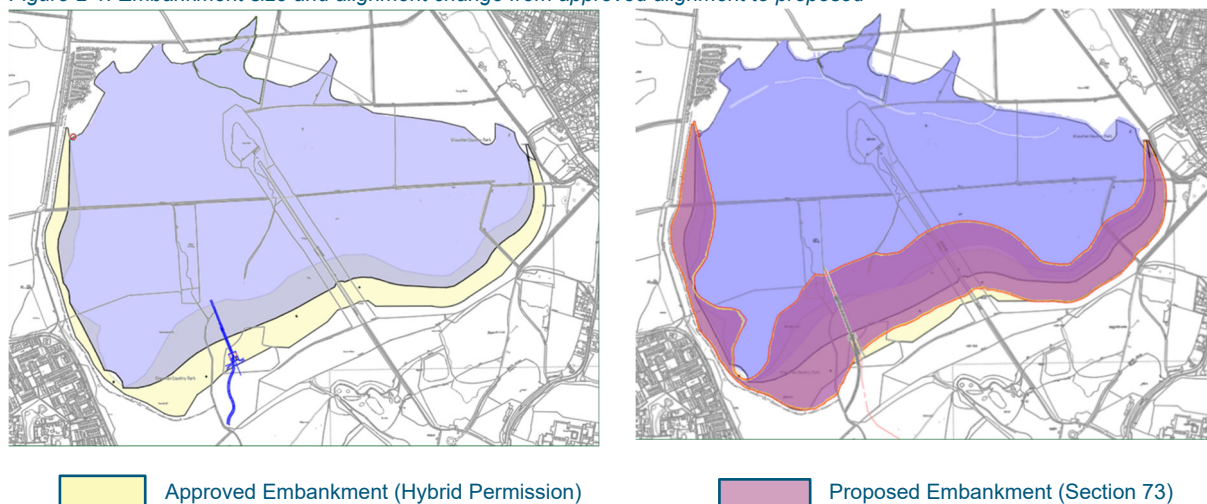
Approved Drawings	Proposed Drawings
SECTION B AND C	MAIN EMBANKMENT SECTIONS B & C
HTR-ATK-ZZ-ZZ-DR-L-00020 SECTION D AND E	HTR-GHD-ZZ-ZZ-DR-T-0010 MAIN EMBANKMENT SECTIONS D & E
HTR-ATK-AR-RE-DR-D-0005 VEHICLE ACCESS ROUTE SOUTH REVC04	HTR-GHD-ZZ-ZZ-DR-T-0002 ACCESS ROUTES VEHICLE ACCESS ROUTE SOUTH SHEET 1 OF 1
HTR-ATK-AR-RE-DR-D-0006 VEHICLE ACCESS JUNCTION SOUTH REVC04	HTR-GHD-ZZ-ZZ-DR-T-0003 ACCESS ROUTES VEHICLE ACCESS ROUTE SOUTH SWANMORE ROAD
-	HTR-COF-EM-RE-DR-GE-4002 MAIN EMBANKMENT PROPOSED SITE LAYOUT
-	HTR-COF-EM-RE-DR-GE-4003 MAIN EMBANKMENT CROSS-SECTIONS
-	HTR-GHD-ZZ-ZZ-DR-T-0013 PROPOSED CULVERT AND VALVE TOWER SITE LAYOUT
-	HTR-GHD-ZZ-ZZ-DR-T-0020 OUTLET WORKS VALVE TOWER & CULVERT GENERAL ARRANGEMENT PLANS AND SECTIONS
-	HTR-GHD-ZZ-ZZ-DR-T-0015 VALVE TOWER GENERAL ARRANGEMENT PLAN AND SECTIONS
HTR-ATK-ZZ-ZZ-DR-L-0015 OUTLINE LANDSCAPE PLAN NORTH WEST CORNER	NO CHANGE
HTR-ATK-AR-RE-DR-D-0001 NORTHERN ACCESS ROUTE OFF B2149	NO CHANGE
HTR-ATK-AR-RE-DR-D-0002 NORTHERN ACCESS JUNCTION OFF B2149	NO CHANGE
HTR-ATK-ZZ-ZZ-DR-L-0007 KEY PLAN 1	<i>SUPERSEDED BY DRAWING HTR-GHD-ZZ-ZZ-DR-T-0001 RESERVOIR OUTLINE MASTERPLAN</i>
HTR-ATK-ZZ-ZZ-DR-L-0008 KEY PLAN 2	<i>SUPERSEDED BY DRAWING HTR-GHD-ZZ-ZZ-DR-T-0001 RESERVOIR OUTLINE MASTERPLAN</i>
HTR-ATK-ZZ-ZZ-DR-L-0009 KEY PLAN 3	<i>SUPERSEDED BY DRAWING HTR-GHD-ZZ-ZZ-DR-T-0001 RESERVOIR OUTLINE MASTERPLAN</i>

Main Reservoir Embankment – Outline and Full Planning Permission

- 2.2.4 The reference design for the main reservoir embankment was based on surveys including ground investigations, which were carried out over several years. It was recognised that the contractor appointed to construct the reservoir would carry out further investigations to inform the detailed design and this would likely result in some refinement of the design.
- 2.2.5 Over the last few years Portsmouth Water and Future Water have completed extensive ground investigations and have completed a trial embankment using clay which was excavated from the reservoir site. This further work has provided a more detailed view of the ground conditions, and a greater understanding of how clay from this site behaves during and after construction. Portsmouth Water and Future Water have used this information to inform the design of the reservoir and have concluded that these changes to the slope angles as proposed in the S73 application of the main reservoir embankment are necessary to ensure its long-term structural strength and integrity.
- 2.2.6 The following changes to the size and alignment of the main reservoir embankment are proposed in this S73 application:
- To facilitate construction of the embankment the southern toe of the main embankment is proposed to be realigned, as shown on drawing HTR-COF-EM-RE-DR-GE-4002 Main Embankment Proposed Site Layout, which includes:
 - Realignment up to 50 m north at the eastern end of the main embankment;
 - Realignment up to 45 m south at the western end of the main embankment; and
 - Minor realignment of the western embankment.
 - The slope angles of the inside and outside embankment faces have been re-designed to be shallower, with the slope reduced to between 1:8 and 1:9, as shown on drawing HTR-COF-EM-RE-DR-GE-4003 Main Embankment Cross-Sections, which results in a larger main embankment footprint that extends further north.
 - As a result of the combination of the realigned embankment and the redesigned slope angles, the crest line of the embankment also moves approximately 80 m north and the overall embankment length increases by 30 m to 2,800 m in total, as shown on as shown on drawing HTR-COF-EM-RE-DR-GE-4002 Main Embankment Proposed Site Layout, including the eastern tie in of the main embankment (the point at which the embankment ties in with the existing ground level) moving up to 55-60 m to the north.

2.2.7 The changes to the size and alignment of the main reservoir embankment proposed for the S73 application are illustrated in **Figure 2-1**, which shows the approved embankment and the proposed embankment.

Figure 2-1: Embankment size and alignment change from approved alignment to proposed



2.2.8 The Application Scheme Parameters (which describe the proposed changes to the Scheme, and to the Scheme Parameters which have informed the environmental assessment work as presented in the ES Addendum to the 2020 ES) set out in **Table 2-2**, include a greater range of slope angles for the main embankment varying between 1:7 to 1:9, which differs from that shown on the application drawings at 1:8 to 1:9. The greater range of slope angles has been included in the Application Scheme Parameters to allow for the opportunity to steepen the slope angles in some areas should that opportunity be possible through further engineering design and assessment work. Portsmouth Water and Future Water are not able to confirm or commit to the steeper slope angles at this time, and therefore the greater range in the Application Scheme Parameters allows that opportunity to come forward in the future, if it proves possible, alongside any necessary consents required. Steepening the slope angles would be beneficial as it would reduce the footprint of the embankment, the volume of material required and the time to construct parts of the embankment. This ES Addendum considers slope angles at both 1:8 to 1:9 and 1:7 to 1:9.

2.2.9 The slope angles for the section of 'Embankment adjacent to Staunton Country Park' is fixed at 1:8 to 1:9 as set out in **Table 2-2** Application Scheme Parameters below.

- 2.2.10 The Application Scheme Parameters set out in **Table 2-2** below, also include +/- 20 m horizontal range for the location of the crest line of the main embankment from that shown on the application drawings. This Application Scheme Parameter is to allow for the opportunity to steepen the slope angles as set out above, which could result in the crest line location moving to enable the steeper slope angles. This ES Addendum considers the +/- 20 m horizontal range for the location of the crest line.
- 2.2.11 The crest line for the section of 'Embankment adjacent to Staunton Country Park' are fixed as set out in **Table 2-2** Application Scheme Parameters below and shown on the application drawing in **Figure 2-1**.
- 2.2.12 The changes to the embankment slopes and alignment have been designed to ensure a cut and fill balance and minimal net change in the reservoir volume, maintaining the minimum total capacity of 8,700 million litres.
- 2.2.13 The height of the embankment crest level of 40.5 m Above Ordnance Datum (AOD) would not change from the 2020 ES.
- 2.2.14 The elements of the main embankment that are proposed as outline and full planning permission are shown on drawing HTR-GHD-ZZ-ZZ-DR-T-0021 Planning Application Strategy Key Plan, consistent with the approach approved under the hybrid planning permission and the Phase 3 Reserved Matters Applications being submitted alongside the S73 Applications.

Reservoir Culvert – Outline Planning Permission

- 2.2.15 The reservoir culvert would provide a route through the main reservoir embankment for reservoir raw water to be pumped into the reservoir from Bedhampton Springs, and for supply water to be discharged to Farlington Water Treatment works via Bedhampton Pumping Station.
- 2.2.16 As a consequence of the main reservoir embankment being realigned, and the embankment footprint increasing, the overall length of the culvert is proposed to increase by approximately 80 m as shown on drawings HTR-COF-EM-RE-DR-GE-4002 Main Embankment Proposed Site Layout and HTR-GHD-ZZ-RE-DR-Z-0003 Proposed Culvert and Valve Tower and Culvert Site Layout.
- 2.2.17 As the reservoir culvert would be located within the embankment structure, it would not be visible under normal operating conditions of the reservoir. However, in the event that the reservoir is fully drawn down (which would only happen for emergency or maintenance reasons), parts of a concrete inlet structure would be visible at the upstream toe (inside) of the embankment. The primary access to the culvert would be via the control building.

Valve Tower – Outline Planning Permission

- 2.2.18 The valve tower would be relocated outside the inner core of the main reservoir embankment. This is required for engineering reasons in order to maintain an uninterrupted homogenous core along the full length of the main embankment which improves its safety, further reduces risk, and enhances the design. The proposed valve tower is shown on drawings HTR-COF-EM-RE-DR-GE-4002 Main Embankment Proposed Site Layout and HTR-GHD-ZZ-RE-DR-Z-0003 Valve Tower and Culvert Site Layout.
- 2.2.19 The valve tower would also provide an upper draw off/intake off from the reservoir as shown on drawings HTR-GHD-ZZ-ZZ-DR-T-0020 Outlet Works Valve Tower & Culvert General Arrangement Plans and Sections, and HTR-GHD-ZZ-ZZ-DR-T-0015 Valve Tower General Arrangement Plan and Sections. The upper draw off/intake structure would consist of a concrete headwall with a rock lined channel extending from the valve tower to the face of the inner embankment slope. This structure would not be visible under normal operating conditions of the reservoir due to its positioning below the top water level.
- 2.2.20 The valve tower would provide a dry area for manual operation, inspection and maintenance of low-level draw off valves from the culvert and access to the high-level draw off valves in the valve tower, and would allow valves and pipework to be removed in accordance with scheduled maintenance activities.
- 2.2.21 As shown on drawings HTR-GHD-ZZ-ZZ-DR-T-0020 Outlet Works Valve Tower & Culvert General Arrangement Plans and Sections, and HTR-GHD-ZZ-ZZ-DR-T-0015 Valve Tower General Arrangement Plan and Sections, the valve tower would have an internal diameter of approximately 8 m and would be constructed of concrete with a plain, neutral coloured finish. The upper 1.5 m of the valve tower would protrude above the high waterline, with this potentially increasing by 1.0-2.0 m seasonally, due to variations in the reservoir water level. The top of the valve tower would be slightly higher (+41.10 m AOD) than the embankment crest (+40.5 m AOD).
- 2.2.22 The primary access to the valve tower will be via the control building and the culvert. Internal stairwells in the valve tower will provide access to the high level draw off valves, continuing to the roof of the valve tower accessed through lockable covers. The top of the valve tower can be accessed by boat, pontoon or other non-permanent method as a secondary means of access in the case of an emergency, however, other options may be considered in the future, and if necessary, will be the subject of a future planning application.

Control House – Outline Planning Permission

- 2.2.23 As a consequence of the main reservoir embankment being realigned and the footprint increasing, the control house is also proposed to move north to match the relocated embankment whilst maintaining the design principle of the building being partially incorporated into the embankment slope as shown on drawings HTR-GHD-ZZ-ZZ-DR-T-0004 Landscape Plan - Control House, HTR-COF-EM-RE-DR-GE-4002 Main Embankment Proposed Site Layout and HTR-GHD-ZZ-ZZ-DR-T-0013 Proposed Culvert and Valve Tower Site Layout.
- 2.2.24 The area required to contain the control house infrastructure has also been increased as a result of the detailed design, increasing from 430 m² to 567 m² and is reflected in the Proposed Scheme Parameters in **Table 2-2**.
- 2.2.25 The ES Addendum considers both the revised control house location and the increased size.

Staircase and Viewing Platform – Full Planning Permission

- 2.2.26 As a consequence of the main reservoir embankment being realigned and the footprint increasing, the staircase and the viewing platform are also proposed to be realigned north and the steps amended to suit the shallower slope angles of the embankment as shown on drawings HTR-GHD-ZZ-ZZ-DR-T-0005 Landscape Plan Avenue Staircase, HTR-COF-EM-RE-DR-GE-4002 Main Embankment Proposed Site Layout and HTR-GHD-ZZ-ZZ-DR-T-0009 Main Embankment Landscape Sections B & C. The staircase and the viewing platform remain aligned with the footpath through Staunton Country Park.

Western Viewing Platform – Outline Planning Permission

- 2.2.27 As a consequence of the main reservoir embankment being realigned the location of the viewing platform is proposed to be relocated slightly to the east and north as shown on drawings HTR-GHD-ZZ-ZZ-DR-T-0001 Reservoir Outline Masterplan and HTR-GHD-ZZ-ZZ-DR-T-0007 Landscape Plan – Viewing Platform.

Gipsies Plain – Full Planning Permission

- 2.2.28 The proposed changes to the main embankment alignment do not change the details granted detailed planning permission for Gipsies Plain as part of the hybrid planning permissions for the reservoir. However, as the main embankment would be realigned up to 50 m north, the approved drawing for Gipsies Plain has been updated to reflect that change and to show how the realigned embankment would tie-in with the approved details. These are shown on drawing HTR-GHD-ZZ-ZZ-DR-T-0006 Landscape Plan Gipsies Plain.

2.3 Application Scheme Parameters

2.3.1 **Table 2-2** sets out the Scheme Parameters as presented in the 2020 ES, describes the proposed changes to the Scheme, and sets out the proposed changes to the Scheme Parameters which have informed the environmental assessment work in this ES Addendum (proposed changes to the Scheme parameters are denoted by an asterisk). All the proposed changes to the Scheme occur within the approved planning application boundary.

2.3.2 The Scheme Parameters are presented in the Section 73 Development Specification and Application Drawings Report (Document Reference: HTR-FUW-ZZ-ZZ-SP-W-0543) which accompanies the S73 planning applications.

Table 2-2: Proposed Scheme Parameters

2020 ES			ES Addendum	
Element	Parameter	Level of Detail	Summary of the proposed changes compared to 2020 ES	Proposed Scheme Parameters being applied for in the S73
Reservoir capacity	Minimum required total capacity: 8,700 million litres Maximum capacity: at least 9,600 million litres, up to a Top Water Level (TWL) of 39.5 m AOD.	Fixed	No change	No change: Minimum required total capacity: 8,700 million litres Maximum capacity: at least 9,600 million litres, up to a TWL of 39.5 m AOD.
Supply rate	Output capacity: at least 21 MI/d in extreme (currently defined as 1:200 year) drought conditions.	Fixed	No change	No change: Output capacity: at least 21 MI/d in extreme (currently defined as 1:200 year) drought conditions.
Embankment	Max 20 m high. Crest level 40.5 m AOD. Length 2,770 m. Inside slope: to range from 1:5 to 1:7. Outside slope: majority 1:7 with local variations to 1:5 at Round Wood and the Avenue woodland (see below). Outer toe (edge): +/- 2 m horizontal range (north to south). Crest line position: 0-37 m horizontal range (to north) to accommodate any potential future need for reducing the outer face slope from 1:5 to 1:7.	Outline	Embankment southern toe realigned approximately to 50 m north at the eastern and up to 45 m south at the western end. Embankment slopes reduced to between 1:7 and 1:9. Embankment crest moved approximately 80 m north. Embankment lengthened by 30 m. Revised embankment location and design shown on drawing HTR-COF-EM-RE-DR-GE-4002.	Changed: Max 20 m high. Crest level 40.5 m AOD. Length 2,800 m*. Inside slope: to range from 1:7 to 1:9*. Outside slope: to range from 1:7 to 1:9*. Outer toe (edge): +/- 2 m horizontal range*. Crest line position: +/- 20 m horizontal range to accommodate any potential alignment change*.

2020 ES			ES Addendum	
Element	Parameter	Level of Detail	Summary of the proposed changes compared to 2020 ES	Proposed Scheme Parameters being applied for in the S73
Embankment adjacent to Staunton Country Park	Toe (edge) of the embankment is fixed at a minimum of 25 m from the edge of woodland along the southern boundary of the Site (known as Hammond's Lands Copse). Length of embankment at 1:5 is approximately 185 m along this stretch and 390 m of embankment with slope varying from 1:5 to 1:7. Staircase detail along alignment of The Avenue joining pedestrian access from Staunton Country Park with viewing area at the crest.	Fixed	The embankment slopes changed to between 1:8 to 1:9. Revised embankment location and design shown on drawing HTR-COF-EM-RE-DR-GE-4002. Revised embankment slopes shown on drawing HTR-COF-EM-RE-DR-GE-4003.	Changed: Toe (edge) of the embankment is fixed at a minimum of 25 m from the edge of woodland along the southern boundary of the Site (known as Hammond's Lands Copse). Embankment with slope varying from 1:8 to 1:9*. Staircase detail along alignment of The Avenue joining pedestrian access from Staunton Country Park with viewing area at the crest.
Top Water Level (TWL)	39.5 m AOD. 1.0 m freeboard (height from TWL to embankment crest) to prevent/limit overtopping.	Fixed	No change	No change: 39.5 m AOD. 1.0 m freeboard (height from TWL to embankment crest) to prevent/limit overtopping.
Spillway/overflow	3 m long weir/700 mm diameter pipe.	Fixed	No change	No change: 3 m long weir/700 mm diameter pipe.
Slope protection material	Range of up to 450 mm thick layer of protection. Rip-rap (rock armour). Rock mattresses would be brushed with topsoil allowing planting with aquatic/marginal species such as reeds and sedge grasses.	Fixed	No change	No change: Range of up to 450 mm thick layer of protection. Rip-rap (rock armour). Rock mattresses would be brushed with topsoil allowing planting with aquatic/marginal species such as reeds and sedge grasses.
Lowest operating level	27.5 m AOD. Lowest 20% to be considered dead storage, minimum level before reservoir operationally fails.	Fixed	No change	No change: 27.5 m AOD. Lowest 20% to be considered dead storage, minimum level before reservoir operationally fails.
Emergency drawdown facility	Discharge capacity of 10.9 m ³ /s. Reservoir can be lowered by 1/3 of water depth in six days. 1.4 m diameter scour pipe and submerged discharge valve discharging into Riders Lane Stream at the proposed control house.	Fixed	No change	No change: Discharge capacity of 10.9 m³/s. Reservoir can be lowered by 1/3 of water depth in six days. 1.4 m diameter scour pipe and submerged discharge valve discharging into Riders Lane Stream at the proposed control house.

2020 ES			ES Addendum	
Element	Parameter	Level of Detail	Summary of the proposed changes compared to 2020 ES	Proposed Scheme Parameters being applied for in the S73
	1.2 m diameter inlet/outlet pipe discharging into the Hermitage Stream 3 km downstream.			1.2 m diameter inlet/outlet pipe discharging into the Hermitage Stream 3 km downstream.
Wetland retaining structure	A retained wetland extending for approximately 1.3 km along the northern shoreline. 4No. retained wetland compartments, plus provision of an area for wet grassland habitat creation to the east of the retained wetland. Retention of wetland during drought levels in main reservoir. Minimum area of retained wetland provided ~10 ha.	Outline (commitment to minimum area)	No change	No change: A retained wetland extending for approximately 1.3 km along the northern shoreline. 4 No. retained wetland compartments, plus provision of an area for wet grassland habitat creation to the east of the retained wetland. Retention of wetland during drought levels in main reservoir. Minimum area of retained wetland provided ~10 ha.
Control house	Maximum width of building frontage: 33 m. Maximum height of building wall above external ground level: 6m (excluding security fence). Schedule of accommodation: total area approximately 430 m ² (excluding courtyard). Reinforced concrete outer structure with cladding, composite roof slab with green roof, steel frame/blockwork internal walls.	Outline	Location of the control house moved north to match relocated embankment and maintain the design principle of the majority of the building being set back into the embankment slope. The area required to contain the control house infrastructure has also been increased as a result of detailed design. Revised location shown on drawings HTR-GHD-ZZ-ZZ-DR-T-0013 and HTR-GHD-ZZ-ZZ-DR-T-0004.	Changed: Maximum width of building frontage: 33 m. Maximum height of building wall above external ground level: 6 m (excluding security fence). Schedule of accommodation: total area approximately 567 m ² * (excluding courtyard). Reinforced concrete outer structure with cladding, composite roof slab with green roof, steel frame/blockwork internal walls.
Visitor Centre	Maximum envelope of 35 m x 55 m and maximum height of 10 m.	Outline	No change	No change: Maximum envelope of 35 m x 55 m and maximum height of 10 m.
Bird Hide	Maximum envelope of 9 m x 20 m and maximum height of 5 m.	Outline	No change	No change: Maximum envelope of 9 m x 20 m and maximum height of 5 m.
Viewing Area	Location along the western boundary and outline design.	Outline	Moved north to match relocated embankment crest. Revised location and design shown on drawings	No change: Location along the western boundary and outline design.

2020 ES			ES Addendum	
Element	Parameter	Level of Detail	Summary of the proposed changes compared to 2020 ES	Proposed Scheme Parameters being applied for in the S73
			HTR-GHD-ZZ-ZZ-DR-T-0001 and HTR-GHD-ZZ-ZZ-DR-T-0007.	
Vehicle Access	New junctions off B2149 (to the north) and Swanmore Road (to the south).	Fixed	No change	No change: New junctions off B2149 (to the north) and Swanmore Road (to the south).
Northern Access Route from junction with B2149 and car park	Single lane single, 3.65 m wide carriageway with passing bays and 0.5 m verges with 0.9 m embankment slopes and a 6.45 m wide footprint.	Outline	No change	No change: Single lane single, 3.65 m wide carriageway with passing bays and 0.5 m verges with 0.9 m embankment slopes and a 6.45 m wide footprint.
Pipeline	Maximum diameter of pipeline: 1.2 m Maximum length: 4.85 km (of which 210 m within reservoir site and application) Maximum envelope for above ground kiosk (associated with discharge structure): H3 m x W6.5 m x L10.5 m is the size of above ground kiosk at Hermitage Stream (excluding slab H0.5 m x W6.5 m x L11.6 m). Overall height: 3.5 m above ground level.	Outline	No change	No change: Maximum diameter of pipeline: 1.2 m Maximum length: 4.85 km (of which 210 m within reservoir site and application) Maximum envelope for above ground kiosk (associated with discharge structure): H3 m x W6.5 m x L10.5 m is the size of above ground kiosk at Hermitage Stream (excluding slab H0.5 m x W6.5 m x L11.6 m). Overall height: 3.5 m above ground level.

2.4 Construction Programme

- 2.4.1 The indicative construction programme presented in the 2020 ES noted that construction of the Scheme could potentially start shortly after consent being granted in Spring 2021. Construction activities, followed by testing and commissioning, would continue until approximately spring 2029.
- 2.4.2 The proposed changes to the Scheme would extend the duration of the construction programme, with wet commissioning now expected in 2031. The main reservoir embankment earthworks would commence in 2025 and would be completed in 2028. The updated indicative construction programme is shown in **Table 2-3**.

Table 2-3: Indicative construction programme

Timescale	Construction activities
Completed	Site establishment and enabling works Northern access road
2024	S73 planning permission expected Wetlands earthworks & structures (commence August 2024) Culvert and Valve Tower construction (commence August 2024)
2025	Wetlands Retaining Structures Main Embankment Earthworks (commence March 2025 - undertake during earthworks seasons) Reservoir Pipe Culvert and Valve Tower Control House Southern Access Road
2026	Main Embankment Earthworks Control House Reservoir Pipe
2027	Main Embankment Earthworks
2028	Main Embankment Earthworks (completion July 2028) Hard Landscaping Emergency Discharge Structure Soft Landscaping Secondary Means of Access – Valve Tower
2029	Wet Commissioning Hard Landscaping Soft Landscaping
2030	Wet Commissioning Soft Landscaping Forestry England track raising & culverts
2031	Wet Commissioning

3 EIA Process, Approach and Methodology

3.1 EIA Process

3.1.1 The ES Addendum follows the same process and methodology as described in the 2020 ES Chapter 5: EIA Process, Approach and Methodology (Vol 2 Chapters 1-6; Document Reference: HTR-ATK-ZZ-ZZ-RP-Z-0101) and has been undertaken by competent experts in line with best practice and IEMA guidelines.

3.1.2 The ES Addendum provides:

- An assessment of the likely effects of the proposed changes to the Scheme on the environment;
- Consideration of mitigation and compensation measures based on the potential environmental effects of the proposed changes to the Scheme; and
- Assessment of the cumulative and in-combination effects of the proposed changes to the Scheme.

3.1.3 The documents listed in **Appendix A: List of Documents from the 2020 ES**, which were prepared for the 2020 ES, have been carefully reviewed and considered and are referenced throughout the ES Addendum.

3.2 Approach to the Environmental Statement Addendum

3.2.1 The topic chapters presented in this ES Addendum are structured as follows:

Competent Expert Advice

3.2.2 This section sets out the chapter author's qualifications.

Review of Legislative and Policy Framework

3.2.3 This section sets out changes to key legislation and policy that are relevant to the topic and which the Scheme may be subject to, or the assessment guided by, since publication of the 2020 ES.

Study Area

3.2.4 The study areas are defined individually for each environmental topic, according to the geographic scope of the potential impacts relevant to that topic, or the information required to assess those impacts.

Assessment Methodology

- 3.2.5 The assessment methodology describes the guidance followed and approach taken for the assessment of each environmental topic, together with the criteria to determine the magnitude of effects and the sensitivity of receptors.

Assessment Assumptions and Limitations

- 3.2.6 Sets out any assumptions and limitations that have been identified in undertaking the assessment of each environmental topic.

Baseline Conditions

- 3.2.7 Sets out the baseline environmental conditions, which are defined to enable the assessment of changes or impacts arising from the proposed changes to the Scheme. The description of the baseline conditions identifies receptors that may be affected and their 'value' or 'sensitivity' to potential changes.

Assessment of Potential Impacts during the Construction Phase

- 3.2.8 Details the assessment of impacts arising from the proposed changes to the Scheme during the construction phase.

Assessment of Potential Impacts during the Operational Phase

- 3.2.9 Details the assessment of impacts arising from the proposed changes to the Scheme during the operational phase.

Design, Mitigation and Enhancement Measures

- 3.2.10 Describes any changes to mitigation and measures to avoid, prevent, reduce or offset any significant adverse effects on the environment, as required by the EIA Regulations.

Assessment of Effects

- 3.2.11 Describes any changes to the significance of effects arising from proposed changes to the Scheme.

Monitoring

- 3.2.12 In accordance with the EIA Regulations, any monitoring requirements and procedures for the construction and operation of the Scheme are identified, based on the requirement to maintain the current standard of the surrounding environment and to ensure the Scheme does not contribute to the degradation of the surrounding environment.

Summary

- 3.2.13 The summary section included at the end of each topic chapter provides an overview of the likely significant construction and operational residual effects arising from the proposed changes to the Scheme.

3.3 Cumulative and In-Combination Effects

- 3.3.1 The EIA Regulations require the assessment of likely significant cumulative effects of a development, either cumulatively with other developments, or the in-combination environmental effects on receptors. **Chapter 18: Cumulative and In-Combination Effects** assesses cumulative and in-combination effects arising from the proposed changes to the Scheme.

4 Scoping

4.1.1 An internal scoping exercise was carried out by technical specialists to examine whether there would be any new or materially different significant effects on the environment arising from the proposed changes to the Scheme, with reference to the topic assessments in the 2020 ES. The following topics, which were examined in the 2020 ES, were considered:

- Air Quality;
- Historic Environment;
- Biodiversity;
- Ground Conditions;
- Landscape and Visual;
- Noise and Vibration;
- Traffic and Transport;
- Material Resources and Waste;
- Water;
- Effect on Climate;
- Vulnerability to Climate Change;
- Population and Human Health;
- Vulnerability to Major Accidents and Disasters; and
- Cumulative and In-Combination Effects.

4.1.2 The scoping exercise for each environmental topic involved:

- A review of changes to the Scheme design and proposed construction methods;
- A review of legislation, policy or guidelines;
- A review of baseline conditions;
- Identification of any further work required to update the topic assessments presented within the 2020 ES arising from the changes to the Scheme; and
- A review of cumulative and in-combination effects.

4.1.3 Following the scoping review, the chapter on Vulnerability to Major Accidents and Disasters was scoped out of further assessment, as the proposed changes to the Scheme would not result in any new, or materially different significant effects.

4.1.4 **Chapters 6 to 18** present updated environmental assessments arising from the proposed changes to the Scheme.

5 Consultation

5.1.1 A consultation workshop on the proposed changes to the Scheme was undertaken on 9th February 2024. The workshop was attended by representatives from the following public bodies and organisations:

- Environment Agency;
- Forestry England;
- Friends of Staunton Country Park;
- Hampshire Bat Group;
- Hampshire Ornithological Society;
- Havant Borough Resident Alliance;
- Havant Climate Alliance;
- Havant Thicket for Nature;
- Havant Wildlife Group;
- Horndean Protection Group; and
- Havant Borough Council, East Hampshire District Council, Hampshire County Council and Rowland's Castle Parish Council.

5.1.2 The workshop invited consultees to provide their opinion and feedback (both in writing and via online meetings and in-person workshops) on the proposed changes to the Scheme. The 'You Said, We Did' Report (Document Reference: HTR-FUW-P3-ZZ-RP-T-0553) details responses received during the consultation exercise and how feedback was considered and/or incorporated into the Scheme, where it has been appropriate to do so.

6 Air Quality

6.1 Competent Expert Evidence

6.1.1 This chapter is based on a review of the 2020 ES Chapter 7: Air Quality assessment (Vol 2 Chapter 7; Document Reference: HTR-ATK-ZZ-ZZ-RP-Z-0107) with consideration of the proposed changes to the Scheme.

6.1.2 This chapter has been compiled and authored by an Air Quality Associate Consultant who has 39 years' experience in the environmental consulting profession, specialising in air quality assessment and environmental impact assessment.

6.2 Review of Legislative and Policy Framework

6.2.1 The legislative and policy framework in respect of air quality has changed little since the publication of the 2020 ES. Relevant updates are discussed in **Table 6-1** below.

Table 6-1: Updates to policy, legislation and guidance relevant to air quality

2020 ES Legislation/Policy/Guidance	Current Policy/Legislation/Guidance	Summary of Updates
National		
NPPF 2019	NPPF December 2023	There is no material change to the NPPF.
	The Environment Act 2021	The Environment Act 2021 gained royal assent in November 2021¹¹. The Act requires the government to set targets on air quality, including for fine particulate matter, in order to deliver cleaner air for all. The Act introduced a legally binding duty on the government to bring forward at least two air quality targets by October 2022: one to reduce annual average PM_{2.5} concentrations in ambient air and the second must be a long-term target (set a minimum of 15 years in the future) in order to encourage long-term investment and to provide certainty for businesses and other stakeholders. A public consultation on the proposed targets closed in June 2022. - The Environmental Targets (Fine Particulate Matter) (England) Regulations 2023¹² sets two PM_{2.5} targets into law and contains provisions on how they will be monitored and assessed. The targets are as follows: - An Annual Mean Concentration Target – limiting PM_{2.5} to 10 µg m⁻³, to be met across England by the end of 2040; and - A Population Exposure Reduction Target – a 35% reduction in population exposure to PM_{2.5} by the end of 2040.
Not mentioned in the 2020 ES	Environmental Improvement Plan	The new Environmental Improvement Plan was published in January 2023 and includes non-statutory interim PM _{2.5} targets of five years in duration as milestones to meeting the full long-term targets.
Local		

¹¹ <https://www.legislation.gov.uk/ukpga/2021/30/contents/enacted>

¹² <https://www.legislation.gov.uk/uksi/2023/96/contents/made>

2020 ES Legislation/Policy/Guidance	Current Policy/Legislation/Guidance	Summary of Updates
Not mentioned in the 2020 ES	Havant Borough Council Local Plan 2036	The Havant Borough Local Plan 2036 was withdrawn from examination in March 2022. A new Local Plan, 'The Building a Better Future Plan' is currently in development.
Not mentioned in the 2020 ES	East Hampshire District Council Draft Local Plan 2021-2040	The EHDC Draft Local Plan 2017-2036 never progressed to adoption. Consultation on the EHDC Draft Local Plan 2021 - 2040 is currently ongoing and the following policies related to air quality matters: • Policy NBE13: Protection of natural resources • Policy HWC1: Health and wellbeing of communities • Policy DGC2: Sustainable transport • Policy DM13: Air quality
Technical Guidance		
Not mentioned in the 2020 ES	Institute of Air Quality Management (IAQM) Guidance	The array of technical guidance on air quality assessment has not changed significantly since the 2020 ES. An updated piece of technical guidance, dealing with the assessment and management of dust from construction activities, from the IAQM was published in August 2023 (version 2.1), this was subsequently withdrawn, as a result of a number of identified technical errors and a new version 2.2 was published in January 2024¹³. The main changes in the updated version 2.2 relate to recommended heights of bunds for dust containment and reductions in the distances from dust sources up to which effects of dust soiling and effects upon human health should be assessed. This change would have the effect of reducing the number of sensitive receptors that were originally included for assessment in the 2020 ES Chapter 7: Air Quality. For the purposes of this ES Addendum follows the same methodology.

6.3 Study Area

- 6.3.1 The study area for the air quality assessment remains unchanged from the 2020 ES. However, in the light of the reductions in assessment buffer distances for construction dust soiling and human health effects, discussed above in **Table 6-1**, the study area for construction dust effects could be decreased in extent. However, the 'footprint' of the reservoir has increased slightly from that in the original design assessed in 2020, so there will be little difference in the scale of potential dust effects.

¹³ <https://iaqm.co.uk/wp-content/uploads/2013/02/Construction-Dust-Guidance-Jan-2024.pdf>

6.4 Assessment Methodology

- 6.4.1 The assessment methodology, in general, is unchanged from that applied in the 2020 ES air quality assessment, other than the small change to the study area referred to above in **Section 6.3**.

6.5 Update to Baseline Environmental Conditions

- 6.5.1 The baseline air quality conditions considered in the 2020 ES referred to monitoring data for the most recent year available (2019) and Defra background map data for the baseline (2019) and future assessment year (2023). Updated baseline monitoring data are available from HBC's most recent Local Air Quality Management (LAQM) report¹⁴ for the years 2022 and 2023 and these are considered below, in relation to the original 2019 data. The most recent report and data from EHDC are for 2020 and 2021¹⁵. Given that this covers the period of the COVID-19 pandemic, it is unlikely that the data will be representative and is not considered herein. The Defra background map baseline concentrations are also considered below in relation to the updated baseline and assessment years.

Local Air Quality Management

- 6.5.2 In 2020, there were no Air Quality Management Areas (AQMAs) within the areas administered by HBC or EHDC. This situation remains unchanged as of January 2024.

Air Quality Monitoring

Continuous Monitoring Data

- 6.5.3 No Continuous Monitoring Sites (CMS) were operated by HBC or EHDC during 2019 and nor are there any CMS operated by Defra's Automatic Urban and Rural Network (AURN) within the local authority areas. This position is unchanged as of January 2024.

Passive Monitoring Data

- 6.5.4 The original Table 7-7 on page 15 of the 2020 ES Chapter 7: Air Quality is reproduced below in **Table 6-2** but incorporating 2022 passive monitoring data for nitrogen dioxide (NO₂) from HBC's LAQM report. Data for 2020 and 2021 have been ignored because of the confounding effects of the pandemic. No data for 2022 were published by EHDC.

¹⁴ <https://www.havant.gov.uk/media/9454/download?inline>

¹⁵ <https://www.easthants.gov.uk/climate-and-environment/air-quality>

Table 6-2: Updated passive Nitrogen Dioxide Monitoring Data

Local Authority	Site ID	Site name	Site Type	2015	2016	2017	2018	2019	2022
HBC	10	Ramblers Way	Suburban	19.6	22.9	20.1	214	20.8	16.2
HBC	15	Front Lawn Junior, Broadmere Ave	Urban Background	13.6	14.7	14.1	-*	-*	-*
HBC	T1	Dunsbury Way	Urban Centre	-	-	-	22.5	-	-
HBC	S1	Trosnant (Field)	Urban Background				22.0	-	-
HBC	S2	Trosnant (Entrance)	Suburban				23.9	-	-
HBC	S8	Barncroft (Woodland)	Urban Background				19.6	-	-
EHDC	HR1	London Road	Roadside	33.3	31.6	36.8	33.8	32.2	-
EHDC	HR7	Gales' Brewery	Roadside	25.9	23.5	32.6	30.3	29.8	-

-* Data unavailable

6.5.5 As only a single monitoring site (site 10 in HBC area) returned a value for 2022, it is considered impractical, on the basis of this limited information, to attempt an update of the air quality monitoring baseline.

Defra Background Map Data

6.5.6 **Table 6-3** below contains an update of the Table 7-8 on page 28 of the 2020 ES Chapter 7: Air Quality, incorporating current (2023) and future assessment year (2027) background map data.

Table 6-3: Original and Updated Defra Background Map Data

Original 2020 ES Data

Grid Square (X,Y)	2019 Background, $\mu\text{g m}^{-3}$				2023 Background, $\mu\text{g m}^{-3}$			
	NO _x	NO ₂	PM ₁₀	PM _{2.5}	NO _x	NO ₂	PM ₁₀	PM _{2.5}
470500,113500	22.4	15.8	14.4	9.9	18.6	13.4	13.8	9.4
470500,112500	22.7	16.0	14.4	10.0	18.9	13.6	13.8	9.5
471500,111500	17.7	12.8	13.2	9.2	15.1	11.1	12.6	8.8
470500,110500	21.6	15.3	14.3	10.0	18.0	13.0	13.7	9.5

Updated 2023 and 2027 Data

Grid Square (X,Y)	2023 Background, $\mu\text{g m}^{-3}$				2027 Background, $\mu\text{g m}^{-3}$			
	NO _x	NO ₂	PM ₁₀	PM _{2.5}	NO _x	NO ₂	PM ₁₀	PM _{2.5}
470500,113500	14.9	11.3	13.5	9.2	12.7	9.7	13.2	8.9
470500,112500	16.3	12.2	13.5	9.3	13.8	10.5	13.2	9.0
471500,111500	13.0	9.9	12.4	8.6	22.4	8.8	12.1	8.3
470500,110500	16.5	12.3	13.5	9.3	13.9	10.6	13.2	9.0

- 6.5.7 It is evident that, on the basis of the background map data, there will be moderate reductions in background air pollutant concentrations across the HBC and EHDC areas between 2019 and 2023 and 2023 and 2027, as a result of reductions in emissions from road vehicles, industrial, commercial and domestic sources. This will decrease the baseline air quality levels for the assessment.

6.6 Assessment of Potential Impacts during the Construction Phase

Findings of 2020 ES Air Quality Assessment

- 6.6.1 The conclusions of the 2020 ES Chapter 7: Air Quality were as follows, with regard to dust and PM₁₀ impacts from the reservoir construction:

- *“The construction phase of the Scheme has the potential to generate dust and PM₁₀ emissions. With appropriate mitigation measures in place however, these works should not result in a significant residual effect at these receptors. The measures will be secured within the Construction Environmental Management Plan (CEMP) by the appointed contractor.”*

- 6.6.2 With regard to impacts upon air quality arising from construction-generated road traffic, the following was concluded:

- *“In the year of assessment, 2023, annual mean NO₂, PM₁₀ and PM_{2.5} concentrations were shown to be below relevant Air Quality Strategy (AQS) objectives at all human health receptors, in all scenarios. The impact of the changes was estimated to be negligible at all receptors, and the effect of the construction traffic considered not to be significant. Annual mean NO_x concentrations at the selected ecological receptors were also shown to be below the critical level AQS objective (30 µg/m³), both with or without the construction traffic, in the assessed year of 2023, with the exception of two sites near the A3(M), north of junction 2.”*

Assessment of the Effects of the Current Scheme

- 6.6.3 With regard to construction dust effects, there are several factors to consider:

- The updated (2024) IAQM technical guidance on assessment of potential dust effects of construction activity has now decreased the study area from activities within which receptors are identified and effects assessed. This means that the 2020 ES air quality assessment likely includes a larger number of sensitive receptors than would be the case now and is therefore considered to be a robust and conservative assessment.

- The reservoir construction period is now forecasted to be two years longer than was envisaged in the 2020 ES and additional material is required to be dug out from the site to construct the main reservoir. However, with regard to the extended timescale, the dust control measures outlined in the 2020 ES will be applied to mitigate dust will be extended to cover the updated construction phase, including the additional materials to be imported and handled on site.

6.6.4 With regard to effects of emissions from construction-generated road traffic movements that were assessed in the 2020 ES Chapter 7: Air Quality, the following matters are relevant to consider:

- Baseline air quality levels will be lower in the new baseline year of 2023 and assessment year of 2027 than in the original 2019 and 2023 years (see **Table 6-3** above). In addition, a new set of vehicle pollutant emission factors was issued by the UK Government in 2023, for use in such assessments¹⁶. This new set of data incorporates the latest information on ongoing reductions in UK vehicle emissions. The effect of this is to decrease the level of effects that would be superimposed upon the now lower baseline, compared to the original assessment, such that the overall resultant air pollutant levels would be lower than those predicted in the 2020 ES Chapter 7: Air Quality.
- Even though additional material is to be transported into the site, a combination of judicial assignment of vehicle payloads combined with the extended construction period, means that average daily construction-generated vehicle flows would be no higher than those assessed in the 2020 ES. This is confirmed in the ES Addendum **Chapter 12: Traffic and Transport**.

6.6.5 On the basis of consideration of the above information, it is concluded that the levels and significance of air quality effects arising from construction dust and construction road traffic emissions would, at worst, be no greater than those predicted in the 2020 ES Chapter 7: Air Quality and, in all likelihood, would be slightly lower, assuming the same level of mitigation measures are applied.

6.7 Assessment of Potential Impacts during the Operational Phase

Findings of the 2020 ES Air Quality Assessment

6.7.1 The conclusion of the 2020 ES air quality assessment was as follows (Vol 2 Chapter 7; page 27, paragraph 7.135):

- *“There is not expected to be a significant effect on air quality during operation, given that the traffic did not meet the relevant criteria for assessment.”*

¹⁶ <https://laqm.defra.gov.uk/air-quality/air-quality-assessment/emissions-factors-toolkit/>

Assessment of the Effects of the Current Scheme

- 6.7.2 As there are no intended changes to the operational details of the current scheme compared to that assessed in the 2020 ES, it is concluded that the findings of the 2020 ES operational air quality assessment remain valid.

6.8 Design, Mitigation and Enhancement Measures

- 6.8.1 All mitigation and enhancement measures proposed for the original scheme will be applied to the control and management of dust and emissions to the current scheme.
- 6.8.2 The air quality design, mitigation and enhancement measures detailed in the 2020 ES remain relevant and no further mitigation measures are required. The mitigation measures are outlined in Table 3-1: Record of Environmental Actions and Commitments (REAC): Reservoir Site of the Outline Environmental Management Plan (OEMP) which forms part of the 2020 ES (Vol 4 Appendix 2.1; Document Reference: HTR-ATK-XX-XX-RP-Z-0069).

6.9 Assessment of Effects

- 6.9.1 The 2020 ES air quality assessment concluded that there would be no significant effects arising from construction dust emissions and construction-generated road traffic emissions. The change in the construction timescales mean that these non-significant effects would be, at worst, no greater than those originally assessed. Although there will be an increase in the footprint of the reservoir, with the decreases in background air quality levels, coupled with ongoing improvements in road vehicle emissions, there will, in all likelihood, be a reduction in the effects originally assessed.

6.10 Monitoring

- 6.10.1 The monitoring measures outlined in Table 3-1: REAC: Reservoir Site of the OEMP which forms part of the 2020 ES (Vol 4 Appendix 2.1; Document Reference: HTR-ATK-XX-XX-RP-Z-0069) remain valid.

6.11 Summary

- 6.11.1 In summary, there will be no changes to the significance of the air quality effects assessed in the 2020 ES Chapter 7: Air Quality. In reality, it is likely that the magnitude of any effects will be lower than those originally assessed.

7 Historic Environment

7.1 Competent Expert Evidence

- 7.1.1 This chapter has been prepared based on a review of the 2020 ES Chapter 8: Historic Environment assessment (Vol 2 Chapter 8; Document Reference: HTR-ATK-ZZ-ZZ-RP-Z-0108) with consideration for the proposed changes to the Scheme by a competent expert with over 25 years' experience in the historic environment practice and has used their knowledge and professional judgement to complete the assessment.

7.2 Review of Legislative and Policy Framework

- 7.2.1 Legislation specific to the protection and conservation of archaeology and heritage has remained unchanged since the submission of the 2020 ES. Updates in policy and guidance are set out in **Table 7-1** and discussed in more detail where a change has occurred.
- 7.2.2 The remaining legislation, local plans and guidance as outlined in the 2020 ES have not been updated or superseded and are still valid.

Table 7-1: Legislation, regulatory, and policy framework for the historic environment

2020 ES Legislation/Policy/Guidance	Current Legislation/Policy/Guidance	Summary of Updates
National		
NPPF 2019	NPPF December 2023	The new NPPF was published in December 2023. The revision in 2021 added policy surrounding statues, plaques, memorial and monuments which stated – “<i>In considering any applications to remove or alter a historic statue, plaque, memorial or monument (whether listed or not), local planning authorities should have regard to the importance of their retention in situ and, where appropriate, of explaining their historic and social context rather than removal</i>” (Paragraph 204). The NPPF 2023 (Chapter 16 - Historic Environment) remained effectively unchanged from the 2021 edition, with only renumbering of some paragraphs. The NPPF (2023) specifies that heritage assets are “<i>an irreplaceable resource and should be conserved in a manner appropriate to their significance, so that they can be enjoyed for their contribution to the quality of life of existing and future generations</i>” (Paragraph 195).
Local		
Havant Borough Council Local Plan 2036	Havant Borough Council Local Plan 2036	The Havant Borough Local Plan 2036 plan was withdrawn from examination on 16 th March 2022. A new Local Plan, 'The Building a Better Future Plan', is currently in development.
East Hampshire District Draft Local Plan (2019)	East Hampshire District Council Draft Local Plan (2021 – 2040)	East Hampshire District Council published a new draft Local Plan for consultation (Regulation 18) in January 2024. The new draft Local Plan policy covers the overarching strategy for Historic Environment in policy NBE14 and issues related to

2020 ES Legislation/Policy/Guidance	Current Legislation/Policy/Guidance	Summary of Updates
		management policies for built heritage, ancient monuments and archaeology in policies DM3-DM10.

7.2.3 The NPPF's associated planning practice guidance on enhancing and conserving the historic environment (NPPG; revised in 2021) includes further information and guidance on how national planning policy is to be interpreted and applied locally. To summarise, UK government planning policy and guidance provides a framework which:

- Recognises that heritage assets are an irreplaceable resource;
- Requires applicants to provide a level of detail that is proportionate to the assets' importance and no more than is sufficient to understand the potential impact of the proposal on their significance;
- Takes into account the desirability of sustaining and enhancing the significance of heritage assets, including any contribution made by their setting, and putting them to viable uses consistent with their conservation;
- Places weight on the conservation of designated heritage assets (which include world heritage sites, scheduled monuments, listed buildings, protected wreck sites, Registered Park and Gardens (RPGs), registered battlefields or conservation areas), with any anticipated substantial harm weighed against the public benefits of the proposal;
- Requires applicants to include a consideration of the effect of an application on the significance of non-designated heritage assets, giving regard to the scale of any harm or loss and the significance of the heritage asset;
- Regard proposals that preserve those elements of the setting that make a positive contribution to the asset (or which better reveal its significance) favourably; and
- Requires developers to record and advance understanding of the significance of any heritage assets to be lost (wholly or in part) in a manner proportionate to their importance and impact, and to make this evidence (and any archive generated) publicly accessible.

7.3 Study Area

7.3.1 All proposed works would be within the planning application boundary for the consented development and there would be no change to the scheme that would require the study area to be extended. Consequently, the study area used for this assessment is the same as that used for the 2020 ES and presented on the historic environment figures (Vol 3 Chapter 8; Document Reference: APP_20_00990-ES_VOL_3_CHAPTER_8_HISTORIC_ENVIRONMENT_FIGURES).

7.4 Assessment Methodology

- 7.4.1 The methodology used for the various assessments undertaken to inform the 2020 ES are still current and therefore the current assessment remains valid except where the proposed development has materially altered or where policy has changed.

7.5 Assessment Assumptions and Limitations

- 7.5.1 The assumptions made to inform the 2020 assessment remain accurate, with the exception that some archaeological investigations are being carried out and early findings are summarised in the Interim Archaeological Findings below.
- 7.5.2 Archaeological investigations have been undertaken under an enabling works Written Scheme of Investigation (WSI) (ECUS 2022; Document Reference: HTR-ECU-RZ-ZZ-PL-X-001) which was approved by the local planning authority.
- 7.5.3 Prior to commencement of main works, this WSI was updated (ECUS 2023; Document Reference: HTR-ECU-RZ-ZZ-PL-X-002) and was submitted to the local planning authority.

7.6 Update to Baseline Environmental Conditions

Previous Assessment

- 7.6.1 The 2020 ES described the non-designated and designated heritage asset baselines of the Site and associated study areas, along with potential archaeological deposits that may be affected as part of the works. These are summarised in the below section.
- 7.6.2 The changes to the scheme have not affected the footprint of the development and as such any study areas considered in the 2020 ES Scope remain appropriate.
- 7.6.3 A detailed examination of the non-designated assets as part of the 2020 ES was set out within Appendix A8.5: Heritage Desk Based Study (Vol 4 Appendix 8.2; Document Reference: HTR-ATK-XX-XX-RP-Z-0033) and for the designated heritage assets a further Statement of Heritage Significance (Vol 4 Appendix 8.1; Document Reference: HTR-ATK-XX-XX-RP-Z-0034) was undertaken.
- 7.6.4 The factors used in determining the value of heritage assets, assessment of magnitude of impact and significance of effect matrix were set out in Tables 8-2, 8-3 and 8-4 of the 2020 ES.

Designated Heritage Assets

- 7.6.5 The National Heritage List for England (NHLE) and local council registers for Conservation Areas were used to review the designated heritage assets within a 2 km buffer from the planning application boundary of the reservoir against the 2020 ES. There are no newly designated heritage assets within the study area that would be affected by the proposed development. There are no World Heritage Sites, protected wrecks or registered battlefields within the 2 km designated asset study area. These are shown at Figure 8-1 of the 2020 ES (Vol 3 Chapter 8; Drawing Number: HTR-ATK-ZZ-ZZ-GS-Z-0051).
- 7.6.6 There are three scheduled monuments within the 2 km study area, namely:
- Motte Castle at Motley's Copse (1019111);
 - Ringwork and Bailey at Motley's Copse (1019110); and
 - The Castle (Rowlands Castle) (1001923).
- 7.6.7 There are two RPGs in the study area with one RPG, Leigh Park, within the planning application boundary:
- Grade II* Leigh Park (Staunton Country Park) (1000112); and
 - Grade II* Stansted Park (1000327).
- 7.6.8 There are three Conservation Areas within the study area with one, Sir George Staunton Conservation Area (which covers much of the same area as RPG Leigh Park), within the planning application boundary:
- Sir George Staunton Conservation Area;
 - Old Bedhampton Conservation Area; and
 - Rowlands Castle Conservation Area.
- 7.6.9 An additional 34 designated heritage assets were identified within the 2 km study area, one Grade II* listed building, the Staunton Memorial (NHLE 1303476), and the remaining 33 designated heritage assets being Grade II buildings.
- 7.6.10 The reservoir site includes approximately 850 m of a 2 km footpath called The Avenue which was associated with the late 19th century modifications which forms part of the Grade II* RPG Leigh Par. It was considered to be of high value heritage asset in the ES, and the associated Sir George Staunton Conservation Area and 13 of the Grade II Listed buildings being of medium value.

Non-Designated Heritage Assets

- 7.6.11 The Hampshire Historic Environment Record (HHER) was used to identify Non-Designated Heritage Assets within a 1 km buffer of the planning application boundary of the reservoir. The HHER was last accessed for this project on 15th November 2019. Full descriptions of the non-designated heritage assets within the study area can be found in Vol 4 of the 2020 ES, Appendix A8.3: Gazetteer of Heritage Assets (Vol 4 Appendix 8.3; Document Reference: HTR-ATK-ZZ-ZZ-RP-Z-0133) and are shown in Figure 8.2: Non-Designated Heritage Assets of the 2020 ES (Vol 3 Chapter 8; Drawing Number: HTR-ATK-ZZ-ZZ-GS-Z-0052).
- 7.6.12 A total of 68 non-designated heritage assets were identified within the 1 km study area, of which two were located within the site boundary, which were:
- An area of iron slag, clinker and pieces of iron found on Gipsies' Plain in the early 1960s (HHER 23391); and
 - Havant Chase (Havant Thicket) lay at the northern extremity of the Bishops Manor of Havant (HHER 34198).
- 7.6.13 The 2020 ES concluded that these two assets are of low value, and the construction of the reservoir would result in the removal of any subsurface remains that still exist. Whilst their removal would be a major adverse impact, due to their low value this would constitute a slight adverse effect, which is deemed not to be significant. The results of archaeological investigation carried out as mitigation which is discussed in more detail in the Interim Archaeological Findings below, have broadly borne out this assessment.
- 7.6.14 The remaining 68 non-designated assets consisted of a range of asset types which included six Prehistoric assets, two of which were Mesolithic, eight Romano-British sites, five medieval assets, 39 post-medieval assets, five World War Two assets and a further five of unknown date.
- 7.6.15 A programme of archaeological investigation has been undertaken at the site to identify and record archaeological remains, allowing for a more detailed understanding of the potential effects of the Scheme than was available for the 2020 ES. These interim results are set out in the Interim Archaeological Findings below.
- 7.6.16 The reservoir site includes the former location of the George Canning monument which was adjacent to The Avenue and erected in 1832 and demolished due to disrepair in the 20th century. This is considered in paragraph **7.6.26** below.

Interim Archaeological Findings

- 7.6.17 An Archaeological Management Plan (AMP) (Atkins 2021; Document Reference: HTR-ATK-ZZ-ZZ-RP-Z-0164) was produced in accordance with Condition 21 of the initial hybrid planning permission (REF 51680/001 and APP/20/00990) which required a Written Scheme of Investigation (WSI) which was produced by ECUS (ECUS 2022; Document Reference: HTR-ECU-RZ-ZZ-PL-X-001) to discharge Condition 22 of the hybrid planning permission. This pertained to the enabling works of the reservoir and access routes which would be monitored via an archaeological watching brief. These works have not been formally reported and the discussion below has been developed from an interim report (ECUS 2022; Document Reference: 18963-HTR-Interim) supplied by the archaeology contractor, ECUS.
- 7.6.18 The initial work that was monitored included three areas of the reservoir site (Areas 1-3) along with twenty Observation Test Pits (OTP 1-19 & 40) and was monitored by ECUS in 2022. Formal reporting to fulfil Condition 24 of the approved planning permission is in progress.
- 7.6.19 The results of the monitoring in Areas 1-3 and the OTP's identified archaeological deposits surviving on the higher areas of the site, principally in Areas 2 and 3, which predominately comprised of curvilinear ditches and pitting, all of which was undated.
- 7.6.20 Some discreet archaeological remains, principally pitting, were identified in some of the OTP's (1, 2, 4, 6, 7 & 9). OTP's 1, 2, 4 & 7 all contained pitting which produced no dating.
- 7.6.21 OTP 6 contained two pits, of which one contained 21 sherds of Early Medieval pottery, which represented at least two vessels. Whilst small, the assemblage is significant due to material from this period being uncommon in East Hampshire (Jervis 2011) and will be retained for latter analysis. The second pit in this OTP did not contain any dateable material.
- 7.6.22 OTP 9 presented a short section of an undated curvilinear ditch and former field boundary which contained modern glass and metalwork, with both features truncated by a sub-rectangular modern intrusion.
- 7.6.23 The remaining OTP's contained only modern disturbance and land drainage. It was noted during excavation of all Areas and OTP's that there was significant truncation from agricultural practices in the form of ridge and furrow and modern plough scarring, as well as tree throws, and there was a general lack of any subsoil, which may have contributed to the limited survival of archaeological deposit.

- 7.6.24 Two further stages of monitoring were undertaken in 2023 from May – August. These phases comprised of stripping large areas topsoil down to the natural geology for enabling works in the central and western portions of the site.
- 7.6.25 The central area of the site had been identified in the 2020 ES as having the highest potential for preservation of Mesolithic archaeological remains and was stripped between May and July 2023. During stripping, discreet deposits of colluvium were identified within naturally lower parts or hollows to the west and north of streams crossing the area, with areas that did not contain colluvium comprising topsoil overlying the natural geology. No cut archaeological features or deposits were identified during the strip of this area, with only a small number of unstratified, abraded flints within the topsoil collected, of which only one is likely to have been worked.
- 7.6.26 The excavation of the base of the demolished Canning's Monument was excavated in October 2023. The excavation showed that the monument was thoroughly demolished, and the majority of the rubble was pushed to the southwest, with only some red brick foundations remaining in situ. More intact fragments of the demolished monument and base were collected during the excavation for further study and exhibition.

Potential Archaeological Remains

- 7.6.27 The 2020 ES concluded there was moderate potential for prehistoric remains, including those related to the Mesolithic period. This conclusion was reached due to Mesolithic remains being identified within the study area from the HER search, along with the site area being crossed by several small streams.
- 7.6.28 Romano-British remains were also assigned a moderate potential of being identified, specifically to the south and eastern extents of the site where extraction for clays and possible pottery production was considered more likely.
- 7.6.29 A high potential for post-medieval to modern archaeological remains were identified, principally related to the landscaping activities associated with the formalisation of the parkland as well as timber production. The majority of this activity was likely to be in close proximity to The Avenue as well as in the east of the reservoir area on 'Gipsy's Plain'.
- 7.6.30 Construction work carried out in 2022 and 2023 has effectively removed archaeological deposits and features within the western part of the reservoir, with archaeological fieldwork carried out as part of this construction demonstrating limited survival of archaeological remains. It is therefore concluded that there is a potential for further archaeological remains to be present in areas of the proposed reservoir that have not yet been subject to construction works, but that preservation of these remains is anticipated to be limited, with significant prior disturbance from agricultural activity.

Settings Assessment

- 7.6.31 A Settings Assessment was undertaken in accordance with Historic England's The Setting of Heritage Assets: Historic Environment Good Practice Advice in Planning Note 3¹⁷ (2017) as part of the 2020 ES.
- 7.6.32 The change of setting to Leigh Park RPG and the Sir George Staunton Conservation Area were considered and the results of the Settings Assessment were outlined in Appendix A8.1: Statement of Heritage Significance of the 2020 ES (Vol 4 Appendix 8.1; Document Reference: HTR-ATK-XX-XX-RP-Z-0034) and are summarised below.
- 7.6.33 The Statement of Heritage Significance and 2020 ES found that while *"The Avenue contributes to an understanding of the late 19th century landscape and changes associated with the ownership of William Stone, the section being impacted represents the late 19th century modifications to the landscape and lacks strong associations with the older Regency landscape. The Avenue is a late addition to the landscape with no discernible purpose and, in part, detracts from the designed landscape focused on Leigh Water, though it does represent the changes in landscape design preferred by Stone over Staunton's earlier design and contributes to the overall historic development of the RPG. The part of The Avenue that retains its connection with Stone's Mansion (of which only the Terrace [NHLE 1155204] remains) would not be impacted by the construction of the reservoir and would continue to convey its value within the historic landscape of the RPG. As such, the construction of the reservoir and access routes has been assessed as having a moderate adverse impact on the RPG, as it would clearly modify the asset. This has been determined to represent a moderate adverse effect, as the value of the RPG would still be retained in the majority, including the value of The Avenue as a feature."*
- 7.6.34 The construction of the reservoir removes a portion of the Sir George Staunton Conservation Area outside of the RPG, an area of open space north of Thicket Lawn which the 2020 ES identified would be incorporated into the reservoir embankment. The 2020 ES noted the area does not include any buildings and makes a limited contribution to the aesthetic and historic character of the conservation area, especially in relation to the conservation area as a whole. Construction activities would prevent the use of the area as part of the wider public open space for the duration of those activities. This was considered to be a temporary moderate adverse impact which would result in a temporary moderate adverse effect. While the effect was assessed as significant and adverse, it was not anticipated that there would be a sufficient impact to cause substantial harm to the conservation area.

¹⁷ [The Setting of Heritage Assets \(historicengland.org.uk\)](https://historicengland.org.uk)

7.6.35 A total of 13 designated assets were identified within close enough proximity to the site to potentially be impacted as a result of settings changes, however these were assessed and either no or negligible impacts were identified resulting in neutral effects which were not considered significant. These were:

- NHLE 1092133 – Pathway (to the south of the Staunton Memorial), Grade II listed building;
- NHLE 1092131 – Barn and Cowshed (20 yards east of Leigh Park Farmhouse) Grade II listed building;
- NHLE 1092132 – Stable Cottage Grade II listed building;
- NHLE 1448130 – Rowlands Castle War Memorial Grade II listed building;
- NHLE 1155182 – Stable Block Grade II listed building;
- NHLE 1254422 – Granary to the east of Redhill House Grade II listed building;
- NHLE 1339960 – the Beacon Grade II listed building;
- NHLE 1339961 – Footbridge Grade II listed building;
- NHLE 1339958 – Garden Wall, Gatepiers and Grotto Grade II listed building;
- NHLE 1339959 – Cartshed (adjoining Barn on the east side) Grade II listed building;
- NHLE 1351135 – Commemorative Stone Grade II listed building;
- NHLE 1092129 – The Gothick Library Grade II listed building; and
- NHLE 1092130 – Leigh Park Farmhouse Grade II listed building.

7.6.36 The Statement of Heritage Significance from 2020 ES noted that during the operation of the reservoir, only small elements of the reservoir would be visible outside its immediate vicinity. It was concluded that views during operation “*within the RPG and conservation area would be marginal and seasonal and would not be so dominant within the landscape as to reduce the value of the Grade II* RPG at Leigh Park (NHLE 1000112) or the Sir George Staunton Conservation Area. Nor would the limited views of the reservoir detract from the setting of the Grade II listed Mansion Terrace (1155204), where views of Leigh Water contribute to its value*”.

7.6.37 The effects of the removal of the Avenue were assessed as persisting into the operation period due to inability of reinstatement and was considered a moderate adverse effect on the RPG and Conservation Area, but harm caused by the operation of the reservoir was considered to be less than substantial harm. Mitigation was to be offered by the agreement of a scheme of landscape recording and conservation-based design aimed at better integrating the proposed reservoir with the existing historic designed landscape (Condition 25).

7.7 Assessment of Potential Impacts during the Construction Phase

- 7.7.1 The proposed changes to the Scheme are within the planning application boundary presented in the 2020 ES and will remain unchanged. The proposed changes to the Scheme are moving the reservoir embankment slightly to the north and the valve tower is moved outside the embankment area. The duration of the construction period would increase by two years.
- 7.7.2 The impacts (i.e. the effective removal of archaeological remains within the planning application boundary) would not alter as a result of the movement of specific activities; indeed much of this effect has already occurred as a result on the ongoing construction activity. Therefore, it is concluded that any direct physical impacts arising from ongoing and future construction activities would not materially change from those assessed in the 2020 ES and are summarised in **Table 7-2** below.
- 7.7.3 As this direct physical impact would not change, the scope and methodology of further archaeological monitoring as laid out within the AMP (Atkins 2021; Document Reference: HTR-ATK-ZZ-ZZ-RP-Z-0164) and covered within the Main Works WSI (ECUS 2023; Document Reference: HTR-ECU-RZ-ZZ-PL-X-002) would remain appropriate.
- 7.7.4 The impact on the remains of the George Canning Monument was considered in the 2020 ES in the wider context of the archaeology of the parkland landscape. In effect, the memorial was demolished in the late 20th century due to its poor condition. Separate to the reservoir project and consent the remains of the monument were excavated in 2023 by the Staunton Country Park Community Archaeology and Heritage Group (SCPCAAG) to a WSI agreed with the Hampshire County Council and elements of the memorial were recovered and retained pending a decision on their display. Mitigation could best be achieved by the agreement of an appropriate course of action, having regard to the nature of the remains recovered, their condition and the value of physical retention and display of these elements of the monument against appropriate dissemination of the results of the investigative work. This work could best be carried out in the light of appropriate specialist analysis of the recovered material and would most appropriately be considered within the archaeological reporting required under Condition 24 of the existing planning permission.

7.7.5 The appearance of the reservoir during construction would change slightly with the revised design of the embankment and valve tower. However, this would be seen against a baseline of construction works changing on a regular basis over the construction period and it is not considered that the effect would be increased, although the duration of construction period effects would increase by up to two years. The magnitude of any change to the setting of Leigh Park RPG, the Sir George Staunton Conservation Area and the Listed Buildings described in the Settings Assessment above during construction, would not be materially altered, but would persist for the additional construction period.

Table 7-2: Potential Impacts during the Construction Phase

Potential Impact	Significance of Potential Impact (2020 ES)	Mitigation (2020 ES)	Significance of Potential Residual Impact (2020 ES)	Justification that the Conclusion of the 2020 ES Remains Valid
Potential effect on known and unknown archaeological sites	Major adverse	Development of an AMP including WSI and implementation of an Archaeological Watching Brief on construction activities.	Negligible	Interim work has identified some archaeological deposits on the high ground which are undated along with Early Medieval pottery within a pit in the southern area of the site. These areas are considered to have had any archaeological deposits identified and removed and the proposed deepening of the reservoir will not affect these areas. There is still potential for archaeological features and deposits to be located in the eastern area of the reservoir site. Further work undertaken on this eastern area should be subject to Archaeological Watching Brief and in combination with the in-place AMP and WSI, is still considered sufficient to preserve by record any archaeological deposits.
Effect on the George Canning Monument	(Considered with other archaeological sites)	Development of an AMP including WSI and implementation of an Archaeological Watching Brief on construction activities.	Negligible	Assessment remains valid. The Canning Memorial has been excavated as a community project by the Staunton Country Park Community Archaeology and Heritage Group to a WSI agreed with the Hampshire County Council Archaeologist. Archaeological recovery of material suitable for display or further interpretation have been limited and any proposals for reporting, display and outreach are subject to discussion between HCC and SCPCHG.
Partial removal of 850 m of the Avenue and effect on RPG and Conservation Area	Temporary moderate adverse	Development of an AMP and exploration of options for enhancement and interpretation of the historic environment.	Moderate adverse (less than substantial)	Interim work has sought engagement with volunteers during the excavation of the George Canning Memorial base and the retrieval of demolished elements of the statuary is being subject to further study with a view to exhibit the findings as part of enhancement of the historic environment. Site works have been

Potential Impact	Significance of Potential Impact (2020 ES)	Mitigation (2020 ES)	Significance of Potential Residual Impact (2020 ES)	Justification that the Conclusion of the 2020 ES Remains Valid
				completed in this area and The Avenue removed, however options for display of the findings of this work as part on enhancement should be progressed in consultation with East Hampshire District Council Conservation Officer and Historic England.

7.8 Assessment of Potential Impacts during the Operational Phase

- 7.8.1 The proposed design modifications which principally are derived from the changes to embankment slope and to the relocation of the valve tower will result in some limited change to the assessment of change to setting of designated heritage assets presented in the 2020 ES. These impacts will mainly be limited to the southern and western views of the reservoir and are presented in **Table 7-3** below.
- 7.8.2 Proposed changes to the embankment design from a slope of ~1:7 to ~1:9 will not reduce the overall height of the embankment, but will instead result in the top of the embankment moving further north away from the RPG, Conservation Area and Listed Buildings. This shallower embankment will result in a more natural incline which will soften the perceptual boundary between parkland and the reservoir, incorporating it into a wider rural landscape. It is not considered, however, that this change would be sufficient to alter the assessed magnitude of impact.
- 7.8.3 The relocation of the valve tower would similarly change the appearance of some views from the conservation area and RPG considered in assessment of change to setting assessed in the 2020 ES, but the valve tower would still be seen in the context of the reservoir and embankment and will not result in any change to the assessed magnitude of impact on settings of the RPG, Conservation Area or Listed Buildings. The valve tower would not appear in views from the core of the park around the former house, as noted in the assessment of viewpoints VR. 1 and VR. 2 in **Table 10-3 (Chapter 10: Landscape and Visual)**.
- 7.8.4 The principle of an agreed scheme of landscape design (Condition 25 of the planning decisions reference APP/20/00990 (Havant Borough Council) and 51680/001 (East Hampshire District Council)¹⁸) would still represent an appropriate mitigation of the effects of the revised embankment and valve tower design.

¹⁸ https://planningpublicaccess.havant.gov.uk/onlineAPP_20_00990-DECISION_NOTICE-1539466.pdf ;
https://planningpublicaccess.easthants.gov.uk/51680_001-Decision_Notice-1167843.pdf

Table 7-3: Potential Impacts to heritage assets during the Operational Phase

Potential impact	Significance of potential impact (2020 ES)	Mitigation (2020 ES)	Significance of potential residual impact (2020 ES)	Justification that the conclusion of the 2020 ES remains valid
Permanent change to setting of RPG and Conservation Area	Moderate adverse	Detailed design to explore options for enhancement and interpretation of the historic environment as part of public realm amenities.	Moderate adverse (less than substantial)	The relocation of the valve tower and change of embankment height are impacts arising during construction that would persist into operation. Both represent limited changes in terms of setting to the RPG and Conservation Area, and as such the magnitude of impact and significance of effect is unchanged. A review of the current landscaping position should be undertaken to identify any potential for enhancement of screening and integration of the proposed development into the historic landscape. Ongoing measures should consider the mechanism to interpret the role of The Avenue in the understanding of value of the Leigh Park RPG and Sir George Staunton Conservation Area in order to offset the harm caused by its partial removal.

7.9 Design, Mitigation and Enhancement Measures

7.9.1 The measures detailed in the 2020 ES Chapter 8: Historic Environment are suitable and no further mitigation measures are required.

7.9.2 The mitigation measures outlined in Table 3.1: REAC: Reservoir Site of the OEMP which forms part of the 2020 ES (Vol 4 Appendix 2.1; Document Reference: HTR-ATK-XX-XX-RP-Z-0069). and set out as Conditions 21-25 of the approved planning permission are appropriate for the proposed changes to the Scheme and no further mitigation measures are required.

7.10 Assessment of Effects

7.10.1 The effects of the proposed changes to the embankment and valve tower positioning have not resulted in any changes to the effects presented in the 2020 ES, and therefore the assessment remains current.

7.11 Monitoring

7.11.1 Provisions for appropriate monitoring of compliance with the approved AMP and WSI are set out within those documents.

7.12 Summary

- 7.12.1 A review of the baseline and assessment presented in the 2020 ES Chapter 8: Historic Environment has demonstrated that the effects of the proposed Scheme changes would result in effects that are no greater than those reported in the 2020 ES.
- 7.12.2 The investigative mitigation agreed with the local planning authority under the two WSIs and AMP (Planning conditions 21-23 of the hybrid planning decisions (APP/20/00990 (HBC) and 51680/001 (EHDC)) would remain appropriate to the proposed changes to the Scheme. The archaeological contractor will be required to submit a post excavation report to the local planning authority to outline the archaeological findings. Following community excavations, discussions about retention and display of fragments of the George Canning Monument in the local area are understood to be continuing between HCC and SCPCAHG.
- 7.12.3 The changes to the embankment design and relocation of the valve tower represent a limited change in the setting of Leigh Park RPG, the Sir George Staunton Conservation Area and the listed buildings within it, but this change is limited and there would be no change to the magnitude of effect assessed in the 2020 ES.

8 Biodiversity

8.1 Competent Expert Evidence

- 8.1.1 This chapter has been prepared based on a review of the 2020 ES Chapter 9: Biodiversity (Vol 2 Chapter 9; Document Reference: HTR-ATK-ZZ-ZZ-RP-Z-0109) with consideration for the proposed changes to the Scheme by a competent expert who is a Chartered Environmentalist and Full Member of the Chartered Institute for Ecology and Environmental Management (CIEEM) with over 20 years' experience as a professional ecologist in the private and public sectors, has used his knowledge and professional judgement to complete the review.

8.2 Review of Legislative and Policy Framework

- 8.2.1 The legislation and policy listed in Table 9-1: Legislation, regulatory, and policy framework for the biodiversity assessment of the 2020 ES have remained unchanged except for the following policies described in **Table 8-1**.

Table 8-1: Updated legislation, policy and guidance

2020 ES Legislation/Policy/Guidance	Current Legislation/Policy/Guidance	Summary of Updates
National		
NPPF 2019	NPPF December 2023	The 2023 NPPF is replacing the NPPF 2019 following the update issued on 19 th December 2023. The chapter headings and contents have been changed and there have been some modifications to the text. However, the changes to the content does not materially affect the proposed scheme as they still accord with the NPPF.
Local		
Havant Borough Council Local Plan 2036	Havant Borough Council Local Plan 2036	Havant Borough Council Local Plan 2036 was withdrawn on 16 th March 2022. The 'Building a Better Future Plan' underwent consultation, and highlights compliance of new developments with the Habitats Regulations and Biodiversity Net Gain. The Scheme has identified mitigation measures for impacts on ecological receptors which are presented in the Biodiversity Mitigation and Compensation Strategy (Document Reference: HTR-ATK-ZZ-ZZ-RP-Y-0001; Atkins, 2022).
East Hampshire District Council Draft Local Plan 2017-2036 (2019)	East Hampshire District Council Draft Local Plan 2021-2040	Status changed. The Draft Local Plan 2017-2036 never progressed to Adoption. East Hampshire District Council published a new draft Local Plan for consultation (Regulation 18) on Monday 22 nd January 2024. This new draft emphasises the Council's aspiration to protect, conserve and enhance wildlife habitats to achieve an overall increase in local biodiversity and uses the Local Plan to reflect national requirements for biodiversity recovery and improvement as set out in the Environment Act 2021.

8.3 Study Area

- 8.3.1 The proposed changes to the Scheme are within the planning application boundary presented in the 2020 ES and the study area for the assessment remains unchanged.

8.4 Assessment Methodology

- 8.4.1 In 2023, CIEEM released an update to the UK Bat Mitigation Guidelines¹⁹ highlighting the significant changes in the understanding of bat ecology and mitigation practice since publication of the guidelines in 2004. However, the methodology used in the assessment of impacts on bats (scoping, baseline and valuation) in the 2020 ES reflects the advice in the updated guidelines and, as with all other terrestrial and aquatic ecological receptors, remains valid.

8.5 Assessment Assumptions and Limitations

- 8.5.1 The assumptions and limitations stated within the 2020 ES are unchanged and therefore the current assessment remains valid.

8.6 Update to Baseline Environmental Conditions

- 8.6.1 As the planning application boundary of the site and associated Zone of Influence (ZoI) remains unchanged, the ecological survey findings that informed the baseline environmental conditions in the 2020 ES remain unchanged and no further updates are required.

8.7 Assessment of Potential Impacts during the Construction Phase

- 8.7.1 Since the publication of the 2020 ES, extensive site clearance and required mitigation measures have taken place as part of the enabling works as described in the detailed Biodiversity Mitigation and Compensation Strategy (Document Reference: HTR-ATK-ZZ-ZZ-RP-Y-0001; Atkins, 2022). The ecological receptors listed in this section are considered to be potentially affected by the extension of the construction programme.
- 8.7.2 For all ecological receptors listed below, the mitigation measures outlined in Table 3.1: REAC: Reservoir Site of the OEMP which forms part of the 2020 ES (Vol 4 Appendix 2.1; Document Reference: HTR-ATK-XX-XX-RP-Z-0069) are valid and relevant.

¹⁹ Reason, P.F. and Wray, S. (2023). *UK Bat Mitigation Guidelines: a guide to impact assessment, mitigation and compensation for developments affecting bats. Version 1.1.* Chartered Institute of Ecology and Environmental Management, Ampfield.

Internationally and Nationally Designated Sites

- 8.7.3 Potential impacts related to the extended period of construction of the reservoir by approximately two years may lead to water quality degradation through mobilisation of sediment and pollutants via hydrological connectivity. As there are no changes to construction or operational impacts, or receptor importance/sensitivity, the assessment of effects has not changed since publication of the 2020 ES. Further details are given in **Chapter 14: Water** of the ES Addendum.
- 8.7.4 No impacts on internationally or nationally designated sites were identified in the air quality and noise and vibration assessments of the Scheme during the construction and operational phases. Further information can be found in **Chapter 6: Air Quality** and **Chapter 11: Noise and Vibration** of the ES Addendum.

Priority Habitats

- 8.7.5 An area of 0.04 ha of purple moor-grass and rush pasture identified along both sides of Riders Lane Stream to the south-west of the Site that was assumed to be retained and enhanced in the 2020 ES, has been temporarily lost to accommodate a strategic sediment pond/lagoon that will stand during the remain of the construction phase. The area of purple moor-grass and rush pasture lost will be reinstated during later stages of the construction phase.

Aquatic Habitats and Species

- 8.7.6 Chapter 9: Biodiversity of the 2020 ES, paragraph 9.300 states that construction would result in *"removal of flow from 0.1 km of functional watercourse immediately downstream of the reservoir"*. This length has now increased by approximately 0.025 km as the toe of the newly proposed embankment will move further north, resulting in a longer section of the non-functional Riders Lane Stream being retained.

Protected Species

- 8.7.7 The extended construction phase has the potential to delay the establishment of proposed habitat creation associated with the construction of the reservoir (e.g. grassland, woodland, hedgerow and wetland) that will benefit protected species such as bats, hazel dormouse, badgers and birds. It also increases the period in which commuting, foraging, nesting and roosting animals may be affected indirectly through disturbance due to temporary lighting, noise and vibration during construction. The mitigation measures in place to minimise disturbance, as described in the OEMP (Vol 4 Appendix 2.1; Document Reference: HTR-ATK-XX-XX-RP-Z-0069), will continue to apply during the extended construction phase.

Summary of Habitat Creation within the Reservoir Site

8.7.8 Habitat loss will remain the same as per Table 9-8 of the 2020 ES Chapter 9: Biodiversity.

8.7.9 The slope angle of the main embankment has been revised and ranges from 1:8 to 1:9 for both the inside embankment slope and outside embankment slope, resulting in a larger main embankment footprint which extends further north. This results in changes to the habitat creation reported in the 2020 ES. A summary of habitat creation based on the proposed changes to the Scheme within the reservoir site is provided in **Table 8-2**.

Table 8-2: Summary of changes to habitat creation within the reservoir site

Habitat Type	Comments	Original Habitat Area in 2020 ES (ha)	Updated Habitat Area Created (ha)
Woodland/wood pasture	Gipsies Plain and Deerslaughter Plain advance planting and additional small areas around the edge of the reservoir footprint	4.30	4.30 (no change)
Grassland	Reservoir embankments	15.83	24.67
Wetland	Along northern edge of reservoir	10.21	10.21 (no change)
Shoreline ephemeral shallows	Along wetland edge	1.68	1.68 (no change)
Scrub/bolstered woodland edge or hedgerows	Around reservoir footprint boundaries	0.91	0.91 (no change)
Open water	The Reservoir (excluding the wetland area)	101.80	93.54

8.8 Assessment of Potential Impacts during the Operational Phase

- 8.8.1 The assessment of potential impacts during the operational phase within the 2020 ES Chapter 9: Biodiversity is unchanged and therefore the current assessment remains valid.

8.9 Design, Mitigation and Enhancement Measures

- 8.9.1 Although the construction programme is extended by approximately two years, the mitigation and compensation measures described in Table 3-1: REAC: Reservoir Site of the OEMP which forms part of the 2020 ES (Vol 4 Appendix 2.1; Document Reference: HTR-ATK-XX-XX-RP-Z-0069) will be implemented through the discharge of the planning conditions associated with the Scheme and no further mitigation measures are required.
- 8.9.2 An Ecological Mitigation, Compensation and Enhancement Measures Report (Document Reference: HTR-RHD-MW-XX-RP-Z-0003) will be submitted to discharge planning condition 36 as part of the reserved matters application for the main reservoir embankment earthworks, reservoir culvert and valve tower.

8.10 Assessment of Effects

- 8.10.1 The assessment of effects has not changed since publication of the 2020 ES; therefore, the assessment remains current.

8.11 Monitoring

- 8.11.1 The monitoring requirements have not changed since the completion of the 2020 ES, therefore the assessment presented in the 2020 ES remains current.

8.12 Overall Assessment Findings

- 8.12.1 Despite some minor changes identified in this Chapter, the overall findings reported in Table 9-10 of the 2020 ES Chapter 9: Biodiversity have not changed since the completion of the 2020 ES; therefore, the assessment remains current.

8.13 Summary

- 8.13.1 The proposed changes to the Scheme lie wholly within the planning application boundary presented in the 2020 ES. A substantial area of habitat has already been cleared as part of the enabling works. No further land take or direct impact on ecological receptors are anticipated with the proposed changes to the Scheme. Although the Scheme construction period will be extended, the impact on ecological receptors is not likely to change, as the mitigation measures outlined in the 2020 ES are sufficient and no further mitigation is required.

9 Ground Conditions

9.1 Competent Expert Evidence

- 9.1.1 This chapter has been prepared based on a review of the 2020 ES Chapter 10: Ground Conditions (Vol 2 Chapter 10; Document Reference: HTR-ATK-ZZ-ZZ-RP-Z-0110) with consideration for the proposed changes to the Scheme by a competent expert with over 20 years' experience in the field of ground conditions and contamination and have used their knowledge and professional judgement to complete the assessment.

9.2 Review of Legislative and Policy Framework

- 9.2.1 Since the 2020 ES was written there have been a number of updates to legislation and guidance which are summarised in **Table 9-1**.
- 9.2.2 When the 2020 ES was written, the NPSWRI was in draft format, and it has since been finalised. It sets out policies to guide how NSIPs Development Consent Order applications should be decided and how the effects of water resources infrastructure are considered. Whilst the scheme is not deemed to be a NSIP, the NPSWRI has the potential to be a material consideration. **Table 9-1** lists the paragraphs from the NPSWRI and other relevant national policy, local policy and guidance that are relevant to ground conditions assessment.

Table 9-1: Updated legislation, policy and guidance relevant to Ground Conditions

2020 ES Legislation/Policy/Guidance	Current Legislation/Policy/Guidance	Summary of Updates
National		
NPPF 2019	NPPF December 2023	The updates are minor between the two policies in relation to ground conditions and do not have a bearing on the assessment.
Draft NPSWRI 2018	NPSWRI 2023	The updates are minor between the two policies in relation to ground conditions and do not have a bearing on the assessment.
Local		
Havant Borough Council Local Plan 2036 – Pre-submission Draft (2019)	Havant Borough Council Local Plan 2036	The Havant Borough Local Plan 2036 was withdrawn from examination on 16 th March 2022. A new Local Plan, 'The Building a Better Future Plan', is currently in development. An update to this strategy is currently being undertaken with Regulation 19 pre-submission consultation on the "Draft Havant Borough Local Plan Building a Better Future" expected to take place in winter 2024/2025. Reference is made to contaminated land and brownfield sites within the Local Plan, however, no specific numbered policies are outlined within the "Draft Havant Borough Local Plan Building a Better Future"
Havant Borough Core Strategy (2011)	Havant Borough Core Strategy (adopted 2011)	Policy DM10 of the HBC Core Strategy outlines that new developments should not result in unacceptable risks to the environment and human health receptors. The land quality and ground conditions assessment has identified the potential

2020 ES Legislation/Policy/Guidance	Current Legislation/Policy/Guidance	Summary of Updates
		receptors that may be impacted by the Proposed Development, the impacts that may result from the construction, operation and decommissioning of the Proposed Development and how these risks can be mitigated.
East Hampshire District Council Draft Local Plan 2017-2036 (2019)	East Hampshire District Draft Local Plan (2021 – 2040)	The updates are minor between the draft local plans in relation to the assessment of brownfield sites and do not have a bearing on the assessment.
Guidance		
Environment Agency. Land Contamination Risk Management Framework undated	Environment Agency. Land Contamination Risk Management Framework 2023	Minor updates since the 2020 ES was written of no consequence to this assessment.

9.3 Study Area

- 9.3.1 The study area on which the planning application boundary is based for the Scheme is the same as the 2020 ES. As such, the study area and the baseline environment will not have changed since the 2020 ES and desk top study were completed (Vol 4 Appendix 10.2; Document Reference: HTR-ATK-ZZ-ZZ-RP-C-0001; and Vol 4 Appendix 10.3; Document Reference: APP_20_00990-ES_VOL_4_APPX_A10.3_PIPELINE_ENVIROCHECK).
- 9.3.2 Freely available databases have been reviewed such as the Defra public registers and there are no updates which would infer a change to the existing baseline at the site. Based on the surrounding land uses it is unlikely that new sources of potential contamination have been introduced above those already identified within the 2020 ES.
- 9.3.3 It is acknowledged that ground breaking activities have been undertaken at the site as part of the enabling works in 2023 and that the site has undergone a site strip which included partial removal of vegetation, grass cutting and topsoil removal. For a full description of current site conditions see **Chapter 2: Changes to the Scheme**.

9.4 Assessment Methodology

- 9.4.1 The full methodology can be found in the 2020 ES and has not changed since its completion therefore the assessment methodology remains current.

9.5 Assessment Assumptions and Limitations

- 9.5.1 The assumptions and limitations can be found in full in the 2020 ES and have not changed since its completion.

9.6 Update to Baseline Environmental Conditions

- 9.6.1 As indicated in **Section 9.3**, the site conditions have changed since the 2020 ES, and during the earthworks there have been no reports of ground contamination sources being uncovered. The change in site conditions will make no material difference to the baseline conditions discussed in the 2020 ES therefore the assessment remains current. The baseline conditions remain the same because there have been no alterations which would impact the assessment already undertaken for the construction phase. There may be a requirement to excavate borrow pits slightly deeper than proposed. This will make no material difference to the assessment taking into account that the geology being excavated is the same.

9.7 Assessment of Potential Impacts during the Construction Phase

- 9.7.1 The potential impacts during the construction phase are summarised in **Table 9-2**.

Table 9-2: Potential Impacts during the Construction Phase - Ground Conditions

Receptor	Potential Impact	Significance of Potential Impact (2020 ES)	Mitigation (2020 ES)	Significance of Potential Residual Impact (2020 ES)	Justification that the Conclusion of the 2020 ES Remains Valid
Geology	Soil erosion and compaction	Minor adverse (not significant)	Design and selection of construction materials in accordance with best practice. Undertake ground improvement works to reduce impacts from ground instability and soil compaction/erosion if required. Incorporate mitigation measures into the construction process, as set out in the REAC: Reservoir Site of the OEMP which forms part of the 2020 ES (Vol 4 Appendix 2.1; Document Reference: HTR-ATK-XX-XX-RP-Z-0069), including the adoption of working methods to appropriately manage soil erosion and compaction, surface water runoff and groundwater during construction.	Minor adverse (not significant)	The proposed, change in the embankment slopes, movement of the water tower and culvert will not change the significance of the potential impact identified in the 2020 ES because the site conditions are the same along with the planning application boundary lateral extents. There may be an additional requirement to excavate borrow pits slightly deeper this will make no material difference to the assessment.
	Ground stability				
Mineral resources	Loss, damage or sterilisation	Negligible (not significant)		Negligible (not significant)	
Human Health	Contamination from on-site and off-site sources	Minor beneficial (not significant)	Design and selection of construction materials in accordance with best practice. Incorporate mitigation measures into the construction process, as set out in the REAC as part of the OEMP which forms part of the 2020 ES, including the adoption of working methods to appropriately manage dust generation, pollution incidents, surface water runoff and groundwater during construction.		
Controlled waters (groundwater)					
Controlled waters (surface water)		Negligible (not significant)		Negligible (not significant)	
Property (existing and future structures and services)					
Ecological					
Soils	Impacts from waste soils generated during construction works	Minor adverse (not significant)	Minimise off-site disposal.	Minor adverse (not significant)	

9.8 Assessment of Potential Impacts during the Operational Phase

9.8.1 The potential impacts during the operational phase are summarised in **Table 9-3**.

Table 9-3: Potential Impacts during the Operational Phase - Ground Conditions

Receptor	Potential Impact	Significance of Potential Impact (2020 ES)	Mitigation (2020 ES)	Significance of Potential Residual Impact (2020 ES)	Justification that the Conclusion of the 2020 ES Remains Valid
Geology	Soil erosion and compaction	Negligible (not significant)	Mitigation undertaken during construction would improve ground conditions for the operational phase. The Scheme will be operated in accordance with the relevant regulations and best practice guidance.	Negligible (not significant)	The proposed change in the embankment slopes, movement of the water tower and culvert will not change the significance of the potential impact identified in the 2020 ES because the site conditions are the same along with the planning application boundary lateral extents. There may be an additional requirement to excavate borrow pits slightly deeper this will make no material difference to the assessment.
	Ground stability			Minor adverse (significant)	
Mineral resources	Loss, damage or sterilisation			Negligible (not significant)	
Human Health	Contamination from on-site and off-site sources	Minor beneficial (not significant)		Minor beneficial (not significant)	
Controlled waters (groundwater)				Negligible (not significant)	
Controlled waters (surface water)					
Property (existing and future structures and services)		Negligible (not significant)			
Ecological			Negligible (not significant)		
Soils	Impacts from waste soils generated during construction works		Minimise off-site disposal.		

9.9 Design, Mitigation and Enhancement Measures

- 9.9.1 The design, mitigation and enhancement measures detailed in the 2020 ES remain relevant.
- 9.9.2 The mitigation measures are outlined in Table 3.1 REAC: Reservoir Site of the OEMP which forms part of the 2020 ES (Vol 4 Appendix 2.1; Document Reference: HTR-ATK-XX-XX-RP-Z-0069).

9.10 Assessment of Effects

- 9.10.1 The effects can be found in full in the 2020 ES and have not changed since its completion therefore the assessment remains current.

9.11 Monitoring

- 9.11.1 The monitoring requirements can be found in full in the 2020 ES and have not changed since its completion therefore the assessment remains current.

9.12 Overall Assessment Findings

- 9.12.1 The overall findings can be found in full in the 2020 ES and have not changed since its completion therefore the assessment remains current.

9.13 Summary

- 9.13.1 It is considered that the 2020 ES is still relevant and appropriate for ground conditions in relation to the proposed changes to the Scheme therefore the assessment remains relevant. Its relevance is on the basis that the Scheme has not increased beyond the planning application boundary extents, the original baseline conditions remain the same and that additional contamination sources have not been identified during the earthworks pertinent to ground conditions.

10 Landscape and Visual

10.1 Competent Expert Evidence

10.1.1 This chapter has been prepared based on a review of the 2020 ES Chapter 11: Landscape and Visual assessment (Vol 2 Chapter 11; Document Reference: HTR-ATK-ZZ-ZZ-RP-Z-0111) with consideration for the changes to the Scheme by a chartered landscape architect with over 40 years' experience in the landscape architecture and used their knowledge and professional judgement to complete the review.

10.2 Review of Legislative and Policy Framework

10.2.1 The legislation and guidance listed in Table 11-1: Legislation, regulatory, and policy framework for landscape and visual amenity of the 2020 ES Chapter 11: Landscape and Visual have remained unchanged except for the following sections described in **Table 10-1** below.

Table 10-1: Review of Legislative and Policy Framework

2020 ES Legislation/Policy/Guidance	Current Legislation/Policy/Guidance	Summary of Updates
National		
NPPF 2019	NPPF December 2023	This NPPF 2023 is replacing the NPPF 2019 following the update issued on 19th December 2023. There is some relevance of the NPPF Chapter 12 to the landscape and visual aspects in that this chapter covers design and making places beautiful. The chapter headings and contents have been changed and there have been some modifications to the text. However, the changes to the content do not materially affect the changes proposed to the Scheme as they still accord with the NPPF 2023. The current relevant NPPF chapters are as follows: • Chapter 2: Achieving sustainable development; • Chapter 3: Plan-making; • Chapter 8: Promoting healthy and safe communities; • Chapter 11: Making effective use of land; • Chapter 12: Achieving well-designed and beautiful places; • Chapter 14: Meeting the challenge of climate change, flooding and coastal change; and • Chapter 15: Conserving and enhancing the natural environment.
Local		
Havant Borough Council Local Plan 2036 – Pre-submission Draft (2019)	Havant Borough Council Local Plan 2036	Status changed. Currently, the development plan in Havant comprises: The Havant Borough Local Plan (Core Strategy) (2011); The Havant Borough Local Plan (Allocations) (2014); The Hampshire Minerals and Waste Plan 1 (2013); The Emsworth Neighbourhood Plan (2021). Work has commenced on a new Local Plan and consultation on a Draft Plan is expected in late 2024.

2020 ES Legislation/Policy/Guidance	Current Legislation/Policy/Guidance	Summary of Updates
East Hampshire District Council Draft Local Plan 2017-2036 (2019)	East Hampshire District Council Draft Local Plan 2017-2036 (2019)	Status changed. This Local Plan never progressed to Adoption. East Hampshire District Council published a new draft Local Plan for consultation (Regulation 18) on Monday 22nd January 2024.

10.3 Study Area

- 10.3.1 The changes to the Scheme lie within the planning application boundary presented in the 2020 ES. The study area for the assessment remains unchanged.

10.4 Assessment Methodology

- 10.4.1 The landscape and visual methodology remains unchanged from the 2020 ES.

10.5 Baseline Conditions

- 10.5.1 There is an ancient woodland within the site which forms part of a Conservation Area - Sir George Staunton & Listed Buildings - Leigh Park (Staunton Country Park), Grade II* RPG. The southern toe of the currently approved embankment extends into an area of a retained woodland spur called 'The Avenue' which is located in the RPG. Most of The Avenue has already been removed. In addition, there is an area of remaining woodland of Round Wood projecting northwards from the main woodland block, this being outside the RPG but within the Conservation Area. Some of the existing woodland within the Conservation Area has already been removed as part of the enabling works by Portsmouth Water in line with the Arboricultural Impact Assessment (ES Vol 4 Appendix 9.14; Document Reference: HTR-ATK-ZZ-ZZ-RP-L-0001).
- 10.5.2 Tree removal works to enable construction of the main reservoir elements have been largely completed as part of the enabling works. Bridleway 120, which extends across the reservoir site from east to west, has been temporarily diverted to the north along Forestry England tracks in Havant Thicket for the duration of the main reservoir construction works.
- 10.5.3 Advance planting has been undertaken as part of the Biodiversity Mitigation and Compensation Strategy on Gipsies Plain and Memory Park on Deerslaughter Plain to the east and southwest of the reservoir site to enhance habitat connectivity. The advance planting started in 2019 and comprises woodland, parkland, grassland, hedge bolstering and pond creation.

10.6 Assessment of Potential Impacts during the Construction and Operational Phases

- 10.6.1 The proposed construction impacts detailed in the 2020 ES paragraphs 11.193 – 11.197 would not change. However, the construction period would be extended by two years due to the proposed design changes, the increased levels of ground works and increase in the embankment material volumes. This would not affect the previously predicted level of construction impacts other than the period of impact would be extended.
- 10.6.2 The proposed operational impacts detailed in the 2020 ES paragraph 11.192 would not change.

10.7 Design, Mitigation and Enhancement Measures

- 10.7.1 The measures detailed in the 2020 ES paragraphs 11.193 – 11.199 are suitable and no further mitigation measures are required.
- 10.7.2 The mitigation measures are outlined in Table 3.1: REAC: Reservoir Site of the OEMP which forms part of the 2020 ES (Vol 4 Appendix 2.1; Document Reference: HTR-ATK-XX-XX-RP-Z-0069).

10.8 Assessment of Potential Landscape and Visual Effects during the Operational Phase

- 10.8.1 As a consequence of the proposed changes to the Scheme, there would be some operational landscape and visual effects, these being mainly limited to the southern and western areas of the reservoir. The changes are described below.

Landscape Effects of Embankment Earthworks

- 10.8.2 The changes to the proposed Scheme include amendments to the size and position of the main reservoir southern, western and southeastern embankment detail. The most significant alterations would be to the southern main reservoir embankment. The slope angles of the inside and outside embankment faces have been re-designed, resulting in a larger main embankment footprint which extends further north.
- 10.8.3 The 2020 ES presents a series of photomontages (ES Vol 3 Chapter 11: Landscape and Visual Part 4 of 4) from a number of locations within the study area to illustrate the visibility of the Scheme within the existing landscape setting. These photomontages have been updated to reflect the proposed Scheme changes and are presented to demonstrate how existing intervening landform and mature vegetation within the site provide a high level of screening and highlight where direct views over the site are possible, and therefore areas that potential mitigation measures are required to reduce the adverse effects arising from the Scheme. For reference, see **Figure 11-29: in Appendix B: Havant Thicket Photo Visualisation Sheets** of the ES Addendum.

- 10.8.4 The changes would result in the area of the embankment footprint increasing in size and the toe of the southern embankment would move slightly northwards in some places away from the ancient woodland to the south. There would be no change to the height of the embankment crest level of 40.5 m AOD, but its position would move further north by approximately 80 m. The embankment would continue to be grass covered with no tree or shrub planting. The reduction in the bund slope angle would reduce its 'engineered' form making it more natural, this being a positive effect particularly in its context of being close to the woodland and being in a Conservation Area and Grade II* RPG. The lower parts of the embankment to the waterside would be largely submerged with only the highest parts above the high waterline, this being 1.5 m when full and potentially dropping by 1.0 - 2.0 m seasonally. There would be a reduction in the area of open water within the reservoir resulting from the embankment extending into areas previously shown as open water.

Assessment of Landscape Effects of Valve Tower and the Reservoir Culvert

- 10.8.5 As a consequence of the main reservoir embankment moving to the north, the reservoir culvert and valve tower would be relocated outside of the core of the reservoir earth embankment. The reservoir culvert would be required to be lengthened due to the main embankment becoming wider.
- 10.8.6 The valve tower would be constructed of concrete with a plain, neutral coloured finish, with a diameter of approximately 8 m. The upper 1.5 m of the valve tower would protrude above the high waterline, with this potentially increasing by 1.0 - 2.0 m seasonally due to variations in water level. It would be located close to the embankment and not within the main central open water area. It would be a small additional element in comparison to the extensive water area within the reservoir. The reservoir culvert would be below the ground and have no landscape impacts. The top of the valve tower would be slightly higher at +41.10 m AOD than the crest of the embankment at +40.5 m AOD.
- 10.8.7 **Table 10-2** provides a review of the effects on the Landscape Character Areas (LCA) and designations identified in the 2020 ES in relation to the embankment earthworks, reservoir culvert and valve tower.

Table 10-2: Review of Schedule of Landscape Effects related to the Construction and Operational Stages

Ref	Identified Character Area and Source	2020 ES Effects During Construction		2020 ES Effects Completion (year 0)		2020 ES Effects Post Mitigation (year 15)		Is there any Change to Assessment Level of Effects Presented in the 2020 ES?	Assessment of Effects
		Magnitude of Change	Significance	Magnitude of Change	Significance	Magnitude of Change	Significance		
Landscape Receptor (LR).1	South Downs Landscape Character Area D2a: Hambledon to Clanfield Downland Mosaic - enclosed (adjacent to the reservoir site and access roads)	Low Adverse	Negligible Adverse Effect	Low Adverse	Neutral Effect	Low Adverse	Neutral Effect	No	The proposed design adjustment area is not located within this LCA.
LR.2	East Hampshire Landscape Character Area 10a: Havant Thicket and Southleigh Forest (covering part of the reservoir site and access roads)	Medium Adverse	Moderate Adverse Effect	Medium Adverse	Minor Adverse Effect	Low Adverse	Negligible Adverse Effect	No	The proposed design adjustment area is not located within this LCA.
LR.3	Havant Landscape Character Area 10: Blendworth Common and woodlands (adjacent to the reservoir site and access roads)	Low Adverse	Minor Adverse Effect	Low Adverse	Minor Adverse Effect	Very Low Adverse	Negligible Adverse	No	The proposed design adjustment area is not located within this LCA.

Ref	Identified Character Area and Source	2020 ES Effects During Construction		2020 ES Effects Completion (year 0)		2020 ES Effects Post Mitigation (year 15)		Is there any Change to Assessment Level of Effects Presented in the 2020 ES?	Assessment of Effects
		Magnitude of Change	Significance	Magnitude of Change	Significance	Magnitude of Change	Significance		
LR.4	Havant Landscape Character Area 11: A3(M) Eastern Corridor (adjacent to the reservoir site and access roads).	Very Low Adverse	Negligible Adverse Effect	Very Low Adverse	Neutral Effect	Very Low Adverse	Neutral Effect	No	The proposed design adjustment area is located within a small part of this LCA. There is a local benefit to the southern edge of the reservoir site where the proposed reservoir embankment in some locations will be moved slightly further from RPG of Staunton Country Park, which is also a Conservation Area. The bank would be less steep and appear slightly less 'engineered'. The valve tower would be a very small element in the wider character area. However, the changes are extremely small in comparison to the whole LCA and not significant and therefore will not result in a change on the predicted level of effects.

Ref	Identified Character Area and Source	2020 ES Effects During Construction		2020 ES Effects Completion (year 0)		2020 ES Effects Post Mitigation (year 15)		Is there any Change to Assessment Level of Effects Presented in the 2020 ES?	Assessment of Effects
		Magnitude of Change	Significance	Magnitude of Change	Significance	Magnitude of Change	Significance		
LR.8	Havant Landscape Character Area 20: Staunton Country Park (covering the reservoir site and access roads)	Medium Adverse	Moderate Adverse Effect	Medium Adverse	Minor Adverse Effect	Low Adverse	Negligible Adverse	No	The proposed design adjustment area is located within a small part of this LCA. There is a local benefit to the southern edge of the reservoir site where the proposed reservoir embankment in some locations will be moved slightly further from the RPG of Staunton Country Park, which is also a Conservation Area. The bank would be less steep and appear slightly less 'engineered'. The valve tower would be a very small element in the wider character area. However, the changes are extremely small in comparison to the whole LCA and not significant and therefore will not result in a change on the predicted level of effects.

Ref	Identified Character Area and Source	2020 ES Effects During Construction		2020 ES Effects Completion (year 0)		2020 ES Effects Post Mitigation (year 15)		Is there any Change to Assessment Level of Effects Presented in the 2020 ES?	Assessment of Effects
		Magnitude of Change	Significance	Magnitude of Change	Significance	Magnitude of Change	Significance		
LR.9	Local Landscape Character Sub Area 10a: Sink Hole Belt – Manor Lodge Road and Bledworth Common (adjacent to the reservoir site and access roads)	Low Adverse	Minor Adverse Effect	Low Adverse	Minor Adverse Effect	Very Low Adverse	Negligible Adverse Effect	No	The proposed design adjustment area is not located within this LCA.

Project related

Ref	Identified Character Area and Source	2020 ES Effects During Construction		2020 ES Effects Completion (year 0)		2020 ES Effects Post Mitigation (year 15)		Is there any Change to Assessment Level of Effects Presented in the 2020 ES?	Assessment of Effects
		Magnitude of Change	Significance	Magnitude of Change	Significance	Magnitude of Change	Significance		
LR.10	Local Landscape Character Sub Area 10aiii West: Wooded Claylands – Havant Thicket and Gypsies Plain (covering the reservoir site and access roads)	Medium Adverse	Moderate Adverse Effect	Medium Adverse	Minor Adverse Effect	Low Adverse	Negligible Adverse	No	The proposed design adjustment area is located within a part of this Rowlands Castle Parish Council Local LCA. There is a local benefit to the southern edge of the reservoir site where the proposed reservoir embankment will be moved slightly further in some places from the RPG of Staunton Country Park, which is also a Conservation Area. The valve tower would be a very small element in the wider character area. However, the changes are extremely small in comparison to the whole LCA and not significant and therefore will not result in a change on the predicted level of effects.
LR.11	Local Landscape Character Sub Area 10aiv: Lavant Valley South (adjacent to the reservoir site and access roads)	Very Low Adverse	Neutral Effect	Very Low Adverse	Neutral Effect	Very Low Adverse	Neutral Effect	No	The proposed design adjustment area is not located within this LCA.

Project related

Ref	Identified Character Area and Source	2020 ES Effects During Construction		2020 ES Effects Completion (year 0)		2020 ES Effects Post Mitigation (year 15)		Is there any Change to Assessment Level of Effects Presented in the 2020 ES?	Assessment of Effects
		Magnitude of Change	Significance	Magnitude of Change	Significance	Magnitude of Change	Significance		
LR.12	Reservoir site Landscape Character (author defined)	Medium Adverse	Moderate Adverse Effect	Medium Adverse	Minor Adverse Effect	Low Adverse	Negligible Adverse Effect	No	The proposed design adjustment area is located within the southern part of this LCA. The proposed design adjustment area is located within a small part of this LCA. There is a local benefit to the southern edge of the reservoir site where the proposed reservoir embankment in some locations will be moved slightly further from the RPG of Staunton Country Park, which is also a Conservation Area. The bank would be less steep and appear slightly less 'engineered'. The valve tower would be a very small element in the wider character area. However, the changes are small in comparison to the whole area and not significant and will have no effect on the predicted level of effects.

Assessment of Visual Effects of Main Reservoir Embankment Earthworks

- 10.8.8 The grassed embankment on the landward side would appear less 'engineered' and this would benefit pedestrian and other receptor views gained from the south and western sides of the reservoir. There would be some benefit to a lesser extent, in more distant pedestrian and other receptor views from the north and northeast where the upper parts of the waterside embankment would similarly be less steep. The reduction in the water surface area resulting from the embankment extending into areas previously shown as open water would reduce the expanse of open water in views from the embankment crest path and lookout.

Assessment of Visual Effects of Valve Tower and the Reservoir Culvert

- 10.8.9 The upper part of the valve tower would be visible in pedestrian views gained from the embankment crest path to the west and south, where it would also be visible from the lookout (located on the south side). There would be some parts of the path in the eastern part of the south side where views would be screened by intervening landform and although the valve tower would extend 0.6 m above the crest embankment, in views from the base of the embankment and some considerable distance further, the top of the valve tower would not be visible due to the intervening height of the embankment crest screening the view due to the angle of the embankment. In more distant views, the small element of the top of the valve tower above the embankment would either be screened by intervening vegetation or be such a small element in a wider view, it would appear insignificant. In views from the northern and central parts of the path at the western end, the valve tower would be seen against a backdrop of the grassed embankment with only 0.6 m being visible above the crest height of the embankment. In other views, it would be seen as extending a marginal distance into the water. Only at close range would the valve tower appear as a prominent feature, but it would still only appear as a small part of the wider reservoir surface. In most views, it would appear as a minor element in the wider landscape.
- 10.8.10 Some views would be gained for pedestrian and cyclist receptors using the paths to the north and northeastern areas beyond the reservoir shore. In views, the valve tower would be seen as a minor element seen against a backdrop of the closely located, grassed upper embankment in the wider extensive view.
- 10.8.11 From other wider pedestrian cyclist and other receptor viewpoints, there would be no views gained of the valve tower due to the intervening embankment screening it.

10.8.12 **Table 10-3** provides a review of the visual effects on the viewpoints identified in the 2020 ES, plus further assessment of some of the viewpoints mapped in figures from the 2020 ES Volume 3 – Chapter 11 – Landscape and Visual Part 1 of 4 Figure 11.8 - Viewpoint Location Plan (Vol 3 Chapter 11; Document Reference: APP_20_00990-ES_Vol_3_Chapter_11_Landscape_and_Visual) which are considered local, relevant and potentially affected by the proposed changes to the Scheme.

Table 10-3: Review of Schedule of Visual Effects for Construction and Operational Stages

Ref	Identified Visual Receptor	ES 2020 Effects During Construction		ES 2020 Effects Completion (year 0)		ES 2020 Effects Post Mitigation (year 15)		2020 ES Applicable Viewpoint Number(s)	Is there any Change to Assessment Level of Effects?	Assessment of Visual Effects
		Magnitude of Change	Significance	Magnitude of Change	Significance	Magnitude of Change	Significance			
Visual Receptor (VR).1	Conservation Area - Sir George Staunton	Medium Adverse	Moderate Adverse Effect	Low Adverse	Minor Adverse Effect	Low Adverse	Minor Adverse Effect	Viewpoint Numbers: 1, 2, 3a, 3b, 4a, 4b and 21.	No	From Viewpoint 1 and 2, the proposed altered reservoir embankment will be visible but set further to the north from the viewer and with a wider level buffer between the woodland edge and the embankment base in some places. The bank would appear slightly less steep. From Viewpoint 3a, 3b and 21, it may remain possible to see partial and oblique views of the embankment crest, towards the top of the woodland canopy and the far shoreline of the reservoir. However, whilst there will be a slight reduction in the adverse impact on receptors gaining views from Viewpoints 1 and 2, with some potential very minor change in the views from Viewpoints 3a, 3b and 21, the changes are small in comparison to the wider effect of the construction of the reservoir.

Project related

Ref	Identified Visual Receptor	ES 2020 Effects During Construction		ES 2020 Effects Completion (year 0)		ES 2020 Effects Post Mitigation (year 15)		2020 ES Applicable Viewpoint Number(s)	Is there any Change to Assessment Level of Effects?	Assessment of Visual Effects
		Magnitude of Change	Significance	Magnitude of Change	Significance	Magnitude of Change	Significance			
										No views of the valve tower would be gained as it would be screened by the embankment. No views to the area of the proposed design changes are gained from Viewpoints 4a and 4b. The changes are not significant and will not change the effects presented in the 2020 ES.
VR.2	Listed Buildings - Leigh Park (Staunton Country Park), Grade II* listed historic park and garden	Medium Adverse	Moderate Adverse Effect	Low Adverse	Minor Adverse Effect	Low Adverse	Minor Adverse Effect	Viewpoint Numbers: 1, 2, 3a, 3b, 4a, 4b and 21.	No	From Viewpoint 1 and 2, the proposed altered reservoir embankment will be visible but set further to the north from the viewer and with a wider level buffer between the woodland edge and the embankment base in some places. The bank would appear slightly less steep. From Viewpoint 3a, 3b and 21, it may remain possible to see partial and oblique views of the embankment crest, towards the top of the

Project related

Ref	Identified Visual Receptor	ES 2020 Effects During Construction		ES 2020 Effects Completion (year 0)		ES 2020 Effects Post Mitigation (year 15)		2020 ES Applicable Viewpoint Number(s)	Is there any Change to Assessment Level of Effects?	Assessment of Visual Effects
		Magnitude of Change	Significance	Magnitude of Change	Significance	Magnitude of Change	Significance			
										woodland canopy and the far shoreline of the reservoir. However, whilst there will be a slight reduction in the adverse impact on receptors gaining views from Viewpoints 1 and 2, with some potential very minor change in the views from Viewpoints 3a, 3b and 21, the changes are small in comparison to the wider effect of the construction of the reservoir. No views of the valve tower would be gained as it would be screened by the embankment. No views to the area of the proposed design changes are gained from Viewpoints 4a and 4b. The changes are not significant and will not change the effects presented in the 2020 ES.

Project related

Ref	Identified Visual Receptor	ES 2020 Effects During Construction		ES 2020 Effects Completion (year 0)		ES 2020 Effects Post Mitigation (year 15)		2020 ES Applicable Viewpoint Number(s)	Is there any Change to Assessment Level of Effects?	Assessment of Visual Effects
		Magnitude of Change	Significance	Magnitude of Change	Significance	Magnitude of Change	Significance			
VR.3	Listed Buildings - Rowlands Castle War Memorial, Grade II listed	Low Adverse	Minor Adverse Effect	Very Low	Neutral Effect	Very Low	Neutral Effect	Viewpoint Numbers: 5b	No	Very limited views to the area of the proposed design changes are gained from this viewpoint. The effects of views being screened by proposed vegetation remain as per the previously predicted effects.
VR.4	Listed Buildings - Leigh Park Mansion Terrace, The Staunton Memorial, Pathway (to the south of Staunton Memorial), Footbridge.	Medium Adverse	Moderate Adverse Effect	Low Adverse	Minor Adverse Effect	Low Adverse	Minor Adverse Effect	Viewpoint Numbers: 2, 3a and 3b	No	From Viewpoint 2, the proposed altered reservoir embankment will be visible but set further to the north from the viewer and with a wider level buffer between the woodland edge and the embankment base in some places. The bank would appear slightly less steep. From Viewpoint 3a and 3b it may remain possible to see partial and oblique views of the embankment crest, towards the top of the woodland canopy and the far shoreline of the reservoir. However, whilst there will be a slight reduction in the adverse impact on receptors

Project related

Ref	Identified Visual Receptor	ES 2020 Effects During Construction		ES 2020 Effects Completion (year 0)		ES 2020 Effects Post Mitigation (year 15)		2020 ES Applicable Viewpoint Number(s)	Is there any Change to Assessment Level of Effects?	Assessment of Visual Effects
		Magnitude of Change	Significance	Magnitude of Change	Significance	Magnitude of Change	Significance			
										gaining views from Viewpoint 2, with some potential very minor change in the views from Viewpoints 3a and 3b, the changes are small in comparison to the wider effect of the construction of the reservoir. No views of the valve tower would be gained as it would be screened by the embankment. The changes are not significant and will not change the predicted level of effects presented in 2020 ES.
VR.6	Public Rights of Way - Bridleway 120	Medium Adverse	Moderate Adverse Effect	Low Adverse	Minor Adverse Effect	Low Beneficial	Minor Beneficial Effect	6, and 17.	No	From Viewpoint 6, the proposed altered reservoir embankment, although moving further northwards in some places, will only likely be partially visible due to the intervening embankment on the far eastern corner of the reservoir screening the view. The bank would appear slightly less steep.

Project related

Ref	Identified Visual Receptor	ES 2020 Effects During Construction		ES 2020 Effects Completion (year 0)		ES 2020 Effects Post Mitigation (year 15)		2020 ES Applicable Viewpoint Number(s)	Is there any Change to Assessment Level of Effects?	Assessment of Visual Effects
		Magnitude of Change	Significance	Magnitude of Change	Significance	Magnitude of Change	Significance			
										Similarly, from Viewpoint 17, the proposed altered reservoir embankment, although moving further northwards in some places, will only likely be partially visible due to the intervening embankment on the southern edge of the reservoir screening the view. The bank would appear slightly less steep. From viewpoint 6, it may be possible to gain a view of the valve tower upper parts above the waterline. It would be seen as a small element within the wider landscape and seen against a backdrop of the grassed embankment. No views of the valve tower would be gained from viewpoint 17 as it would be screened by the embankment. From all the viewpoints, this will only result in a very minor change in the views. The changes are not significant

Project related

Ref	Identified Visual Receptor	ES 2020 Effects During Construction		ES 2020 Effects Completion (year 0)		ES 2020 Effects Post Mitigation (year 15)		2020 ES Applicable Viewpoint Number(s)	Is there any Change to Assessment Level of Effects?	Assessment of Visual Effects
		Magnitude of Change	Significance	Magnitude of Change	Significance	Magnitude of Change	Significance			
										and will have no effect on the predicted level of effects.
VR.7	Public Rights of Way - Bridleway 121	Medium Adverse	Moderate Adverse Effect	Low Adverse	Minor Adverse Effect	Low Beneficial	Minor Beneficial Effect	10a and 10b	No	Similarly, from Viewpoints 10a and 10b, the proposed altered reservoir embankment, although moving further northwards in some places, will only likely be partially visible due to the intervening embankment on the southern edge of the reservoir screening the view. The bank would appear slightly less steep. No views of the valve tower would be gained from viewpoints 10a and 10b as it would be screened by the embankment. From all the viewpoints, this will only result in a very minor change in the views. The changes are not significant and will have no effect on the predicted level of effects.
VR.8	Public Rights of Way - E9 European	Medium Adverse	Moderate Adverse Effect	Low Adverse	Minor Adverse Effect	Low Beneficial	Minor Beneficial Effect	4b, 5a and 7	No	From Viewpoint 5a, the proposed altered reservoir embankment, although

Project related

Ref	Identified Visual Receptor	ES 2020 Effects During Construction		ES 2020 Effects Completion (year 0)		ES 2020 Effects Post Mitigation (year 15)		2020 ES Applicable Viewpoint Number(s)	Is there any Change to Assessment Level of Effects?	Assessment of Visual Effects
		Magnitude of Change	Significance	Magnitude of Change	Significance	Magnitude of Change	Significance			
	Long Distance Route, Staunton Way									moving further northwards in some places, will only likely be partially visible due to the intervening embankment on the far eastern corner of the reservoir screening the view. The bank would appear slightly less steep. From Viewpoint 7 the proposed altered reservoir embankment would move further northwards and will appear nearer. The bank would appear slightly less steep. However, the change to the view will be small in extent. From viewpoint 7, it may be possible to gain a view of the valve tower upper parts above the waterline. It would be seen as a small element within the wider landscape and seen against a backdrop of the grassed embankment. No views to the area of the proposed design change are

Project related

Ref	Identified Visual Receptor	ES 2020 Effects During Construction		ES 2020 Effects Completion (year 0)		ES 2020 Effects Post Mitigation (year 15)		2020 ES Applicable Viewpoint Number(s)	Is there any Change to Assessment Level of Effects?	Assessment of Visual Effects
		Magnitude of Change	Significance	Magnitude of Change	Significance	Magnitude of Change	Significance			
										gained from Viewpoints 4b and 5a. From all the viewpoints, this will only result in a very minor change in the views. The changes are not significant and will have no effect on the predicted level of effects.
VR.16	Residential - Properties on the west side of the southern end of B2149 Manor Lodge Road.	Medium Adverse	Moderate Adverse Effect	Low Adverse	Minor Adverse Effect	Low Adverse	Negligible Adverse Effect	5a	No	From Viewpoint 5a, the proposed altered reservoir embankment, although moving further northwards, will only likely be partially visible due to the intervening embankment on the far eastern corner of the reservoir screening the view. No views of the valve tower would be gained from viewpoint 5a as it would be screened by the embankment and intervening vegetation. From all the viewpoints, this will only result in a very minor change in the view. The changes are not significant

Project related

Ref	Identified Visual Receptor	ES 2020 Effects During Construction		ES 2020 Effects Completion (year 0)		ES 2020 Effects Post Mitigation (year 15)		2020 ES Applicable Viewpoint Number(s)	Is there any Change to Assessment Level of Effects?	Assessment of Visual Effects
		Magnitude of Change	Significance	Magnitude of Change	Significance	Magnitude of Change	Significance			
										and will not change the predicted level of effects.
VR.17	Residential - Properties on Well Meadow	Medium Adverse	Moderate Adverse Effect	Medium Adverse	Moderate Adverse Effect	Low Adverse	Minor Adverse Effect	13	No	No views to the area of the proposed design changes are gained from this viewpoint.
VR.18	Residential - Properties on Winterslow Drive	Medium Adverse	Moderate Adverse Effect	Medium Adverse	Moderate Adverse Effect	Low Adverse	Minor Adverse Effect	12	No	Views from upper storeys of residential properties to the area of the proposed design changes are gained from this viewpoint. However, the proposed planting as it matures will soften the views as per the previously predicted effects.
VR.19	Residential - Properties on Swanmore Road.	Medium Adverse	Moderate Adverse Effect	Low Adverse	Minor Adverse Effect	Low Adverse	Negligible Adverse Effect	34	No	No views to the area of the proposed design changes are gained from this viewpoint.
VR.21	Roads and Other Transport Routes - Middle Park Way	Low Adverse	Minor Adverse	Low Adverse	Negligible Adverse Effect	Very Low	Neutral Effect	21	No	Glimpsed views from gateways to the area of the proposed design changes are likely to be gained from this viewpoint. Post proposed planting establishment views from the road will be further screened and benefit from the newly establish green

Project related

Ref	Identified Visual Receptor	ES 2020 Effects During Construction		ES 2020 Effects Completion (year 0)		ES 2020 Effects Post Mitigation (year 15)		2020 ES Applicable Viewpoint Number(s)	Is there any Change to Assessment Level of Effects?	Assessment of Visual Effects
		Magnitude of Change	Significance	Magnitude of Change	Significance	Magnitude of Change	Significance			
										infrastructure helping the new reservoir bed into the landscape as per the previously predicted effects.
VR.22	Roads and Other Transport Routes - B2149 Durrants Road/B2149 Manor Lodge Road	Low Adverse	Minor Adverse	Very Low	Neutral Effect	Very Low	Neutral Effect	5b and 35	No	From Viewpoint 5b, the proposed altered reservoir embankment, although moving further northwards, will only likely be partially visible due to the intervening embankment on the far eastern corner of the reservoir screening the view. No views of the valve tower would be gained from viewpoint 5a as it would be screened by the embankment and intervening vegetation. From the viewpoint, this will only result in a very minor change in the views. The changes are not significant and will not change the predicted level of effects. From Viewpoint 35, no views to the area of the proposed design change are gained from this viewpoint.

Project related

Ref	Identified Visual Receptor	ES 2020 Effects During Construction		ES 2020 Effects Completion (year 0)		ES 2020 Effects Post Mitigation (year 15)		2020 ES Applicable Viewpoint Number(s)	Is there any Change to Assessment Level of Effects?	Assessment of Visual Effects
		Magnitude of Change	Significance	Magnitude of Change	Significance	Magnitude of Change	Significance			
VR.23	Roads and Other Transport Routes - Swanmore Road	Medium Adverse	Moderate Adverse Effect	Low Adverse	Minor Adverse Effect	Low Adverse	Negligible Adverse Effect	34	No	No views to the area of the proposed design changes are gained from Viewpoint 34. There is a dense hedgerow on the eastern side of Swanmore Road which helps screen views towards the site and the proposed further planting east of the hedgerow will mature over time to screen the view.

10.9 Summary

Overall Landscape Effects

Construction

- 10.9.1 As a result of the proposed design changes, there would be no change to the landscape construction effects except for the extension of the construction period of time by two years.

Operational

- 10.9.2 The changes to the embankment slope design would result in a reduction of the angle of embankment slope of the reservoir site area. The valve tower relocation would be a local modification limited to a small area of the overall reservoir area. The overall effect is no change from the previously predicted level of effects as recorded in the 2020 ES Chapter 11: Landscape and Visual Table 11-18: Likely effects on landscape character (reservoir site and access roads).

Overall Visual Effects

Construction

- 10.9.3 As a result of the proposed design changes, there would be no change to the visual construction effects except for the extension of the construction period of time by two years.

Operational

- 10.9.4 The changes to the embankment slope design would have a locally beneficial visual effect on the landscape of the reservoir site area and although there would be some minor adverse effects as a result of the valve tower relocation, it would be limited to a small part of the overall reservoir area. The overall effect is no significant change from the previously predicted level of effects as recorded in the 2020 ES Chapter 11: Landscape and Visual Table 11-19: Likely visual effects (reservoir site and access roads).

11 Noise and Vibration

11.1 Introduction

- 11.1.1 This chapter of the ES Addendum has been prepared based on a review of the 2020 ES Chapter 12: Noise and Vibration (Vol 2 Chapter 12; Document Reference: HTR-ATK-ZZ-ZZ-RP-Z-0112) assessment with consideration for the proposed changes to the Scheme. The proposed changes to the Scheme relate to alterations to the design of the main reservoir embankment, reservoir culvert and valve tower.

11.2 Competent Expert Evidence

- 11.2.1 The noise and vibration implications of the proposed changes to the Scheme are assessed from both a construction and operational perspective.
- 11.2.2 This chapter has been prepared by a competent expert with at least 17 years' experience in the field of acoustic consultancy, and corporate members of the Institute of Acoustics. The competent person has used the knowledge and professional judgement to undertake this assessment.

11.3 Review of Legislative and Policy Framework

- 11.3.1 The 2020 ES Chapter 12: Noise and Vibration included a detailed review of salient noise and vibration policy relevant to the consented application. The legislative and policy framework in respect of noise and vibration has changed little since the publication of the 2020 ES.
- 11.3.2 To understand if there has been a significant change in policy that could impact the assessment a review against current policy has been undertaken. This policy review is provided within **Table 11-1**.

Table 11-1: Legislation, regulatory, and policy framework for the Noise and Vibration assessment

2020 ES Legislation/Policy/Guidance	Current Legislation/Policy/Guidance	Summary of Updates
National		
NPPF 2019	NPPF December 2023	No material changes.
Local		
Havant Borough Local Plan (Core Strategy) (2011), The	Havant Borough Local Plan (Core Strategy) (2011); The	At the time of submission of the 2020 ES, Havant Borough Council had consulted on a draft Local Plan which included

2020 ES Legislation/Policy/Guidance	Current Legislation/Policy/Guidance	Summary of Updates
Havant Borough Local Plan (Allocations) (2014) and Draft Havant Borough Local Plan 2036 (2019)	Havant Borough Local Plan (Allocations) (2014)	policy KS8 regarding Havant Thicket reservoir. The draft Local Plan was subsequently withdrawn in April 2022. Havant Borough Council is currently developing an updated Local Plan, however at the current time (January 2024) the adopted 2011/14 plans remain current. Havant Thicket reservoir is included as Strategic Site 2 within the 2011/14 documents. A series of infrastructure requirements for Havant Thicket reservoir are noted within the adopted Local Plans, which would have been material considerations when the planning application was determined and remain a material consideration for the changes proposed within this application.
East Hampshire District Local Plan (2014), Draft East Hampshire District Council Local Plan 2017-2036 (2019)	East Hampshire District Local Plan (2014), Draft East Hampshire District Council Local Plan 2021-2040 (2024),	At the time of submission of the 2020 ES, East Hampshire District Council had consulted on a draft Local Plan which included policy S31 regarding Havant Thicket reservoir. The draft Local Plan has been superseded by more recent drafts. The 2014 Local Plan included allocation of the Havant Thicket site for a new reservoir and would have been a material consideration when the planning application was determined and remain a material consideration for the changes proposed within this application. Regulation 18 consultation on a new Local Plan has begun in January 2024. Notably the consultation draft does not allocate the Havant Thicket Reservoir. Some of the policies which cover the noise aspects are: • Policy NBE13 -Protection of natural resources • Policy CLIM4 – Renewable and low carbon energy • Policy DM11 - Amenity

11.3.3 With regard to policies on Noise and Vibration, the policy tests at the National and Local level have not materially changed from those considered within the 2020 ES.

11.3.4 Whilst it is noted both Havant Borough Council and East Hampshire District Council are updating their Local Plans, neither adopted Local Plan has changed since the 2020 planning application.

11.4 Study Area

11.4.1 The planning application boundary of the Scheme and the study area on which the assessment is based has not changed since the 2020 ES.

11.5 Assessment Methodology

11.5.1 The methodology used for the various surveys and assessments undertaken to inform the 2020 ES are still current and therefore the current assessment remains valid.

11.6 Assessment Assumptions and Limitations

- 11.6.1 The assumptions and limitations within the 2020 ES are unaffected and therefore the current assessment remains valid.

11.7 Update to Baseline Environmental Conditions

- 11.7.1 **Chapter 12: Traffic and Transport** of the ES Addendum considers changes to baseline traffic flows and those resulting from the Scheme, noting that the 2023 future baseline remains consistent with that assessed in the 2020 ES.
- 11.7.2 To inform this analysis, a review of publicly available mapping and satellite information has been undertaken. No changes to the noise sensitive receptors likely to be affected by the Scheme have been identified. In addition, no significant changes to the noise sources likely to be contributing to baseline noise levels at the sensitive receptors have been identified. On this basis the baseline environment is unlikely to have changed sufficiently to affect the conclusions of the assessment presented in the 2020 ES Chapter 12: Noise and Vibration.

11.8 Assessment of Potential Impacts during the Construction Phase

Construction Noise

- 11.8.1 The footprint of the reservoir has receded on the southern aspect, effectively moving some elements of the embankment and associated construction activity further away from sensitive receptors.
- 11.8.2 Following the locations and methodology of the 2020 ES, maximum daytime reservoir construction noise levels at the established residential receptors have been calculated using a 3-d computational noise model created in SoundPLAN (v9.0) modelling software and are presented in **Table 11-2** below. This table is an updated version of Table 12-14 in the 2020 ES Chapter 12: Noise and Vibration, for the revised scheme years. Note that these values are worst-case and typical levels will be lower.

Table 11-2: Maximum calculated daytime construction noise levels (dBA) at residential receptors

Receptor	2024	2025	2026	2027	2028
Mulberry Cottage, 2, Manor Lodge Road, Rowland's Castle, PO9 6BA	37 to 54	49 to 50	51	51	37 to 53
The Former Rectory, 74, Manor Lodge Road, Rowland's Castle, PO9 6BA	39 to 55	50 to 52	53 to 54	54	37 to 57
1, Durrants Road, Rowland's Castle, PO9 6BE	37 to 53	48 to 50	53	53 to 54	36 to 55
50A, Durrants Road, Rowland's Castle, PO9 6BG	37 to 53	49 to 49	52	52	36 to 54

Receptor	2024	2025	2026	2027	2028
93, Winterslow Drive, Havant, PO9 5DZ	43 to 62	57	56	56	47 to 56
35, Well Meadow, Havant, PO9 4LW	43 to 64	56 to 57	56	57	40 to 57
1, Stratfield Gardens, Havant, PO9 4LS	44 to 60	56 to 58	57	56	55 to 59
2, Abbas Green, Havant, PO9 4EP	38 to 56	50 to 59	53 to 56	51 to 54	51 to 56

- 11.8.3 The worst-case predicted reservoir construction noise levels for each location and year show that noise levels do not exceed the daytime threshold for potential significant effects. Thus, there is no change from the conclusions of the 2020 ES.

Construction Vibration

- 11.8.4 The 2020 ES found no significant impacts from construction vibration, and as the footprint of the reservoir has receded from receptors on the southern aspect, this will be unchanged.

11.9 Assessment of Potential Impacts during the Operational Phase

- 11.9.1 The assessment of potential impacts during the operational phase within the 2020 ES are unaffected and therefore the findings of the 2020 ES remain valid for the revised scheme.

11.10 Design, Mitigation and Enhancement Measures

- 11.10.1 The design, mitigation and enhancement measures detailed in the 2020 ES remain relevant and no further mitigation measures are required.

11.11 Assessment of Effects

Construction Effects

- 11.11.1 The ES Addendum has identified that there has been no change to the sensitivity of receptors or to the magnitude of impacts anticipated during construction of the Scheme. On this basis it is concluded that there will be no significant change in effects resultant from construction of the revised Scheme from a noise and vibration perspective.

Operational Effects

- 11.11.2 The ES Addendum has identified that there has been no change to the sensitivity of receptors or to the magnitude of impacts anticipated during operation of the Scheme. On this basis it is concluded that there will be no significant change in effects resultant from operation of the revised Scheme from a noise and vibration perspective.

11.12 Monitoring

- 11.12.1 The noise and vibration mitigation measures detailed in the 2020 ES remain relevant and no further mitigation measures are required. The mitigation measures are outlined in Table 3.1: REAC: Reservoir Site of the OEMP from the 2020 ES (Vol 4 Appendix 2.1; Document Reference: HTR-ATK-XX-XX-RP-Z-0069).

11.13 Summary

- 11.13.1 Review of the baseline and assessment presented in the 2020 ES Chapter 12: Noise and Vibration has demonstrated that the effects of the proposed amendments to the embankment and valve tower would result in effects that are no greater than those reported in the 2020 ES.
- 11.13.2 The mitigation agreed for the consented scheme would remain appropriate to the proposed changes to the Scheme.

12 Traffic and Transport

12.1 Competent Expert Evidence

- 12.1.1 This chapter of the ES Addendum considers the traffic and transport impacts and effects resulting from the proposed changes to the Scheme. The changes to the Scheme relate to alterations to the design of the main reservoir embankment, reservoir culvert and valve tower. No alterations are sought to the consented scheme for the pipeline.
- 12.1.2 The traffic and transport implications of the proposed changes to the Scheme are assessed from both a construction and operational perspective.
- 12.1.3 This chapter has been prepared by competent experts with 25 years' experience in the field of transport planning, a member of Chartered Institute of Logistics and Transportation, Fellow of the Chartered Institute of Highways and Transportation and an MEng in Civil Engineering. The competent person used their knowledge and professional judgement to undertake this assessment.

12.2 Review of Legislative and Policy Framework

- 12.2.1 The 2020 ES Chapter 13: Traffic and Transport (Vol 2 Chapter 13; Document Reference: HTR-ATK-ZZ-ZZ-RP-Z-0113) and associated Transport Assessment ('2020 TA') (Vol 4 Appendix 13.1; Document Reference: HTR-ATK-XX-XX-RP-Z-0043) included a detailed review of salient transport policy that influenced the development of the transport strategy for the consented application.
- 12.2.2 To understand if there has been a significant change in transport policy that could impact the traffic and transport assessment a review against current policy has been undertaken. This policy review is provided within **Table 11-1**.

Table 12-1: Legislation, regulatory, and policy framework for the Traffic and Transport assessment

2020 ES Legislation/Policy/Guidance	Current Legislation/Policy/Guidance	Summary of Updates
National		
NPPF 2019	NPPF December 2023	No material changes.
Planning Practice Guidance (PPG) - 2014	Planning Practice Guidance (PPG) - 2014	No change.
The Guidelines for the	Environmental Assessment of	The IEMA Guidelines were updated in 2023. The updated

2020 ES Legislation/Policy/Guidance	Current Legislation/Policy/Guidance	Summary of Updates
Environmental Assessment of Road Traffic 1993	Traffic and Movement - 2023	guidelines provide the basis for a systematic, consistent and comprehensive coverage for the assessment of traffic and movement impacts for a wide range of development projects. In addition to traffic and movement expert advice, guidance has been provided by competent experts leading related impact assessments that have interactions with traffic and movement. In the context of the Scheme, the IEMA guidance would not make a material change to the assessments undertaken.
Local		
Hampshire Local Transport Plan (LTP 3) 2011-2031	Hampshire Local Transport Plan (LTP 3) 2011-2031, Draft LTP 4 (April 2022) ²⁰	Whilst LTP 3 is adopted, Hampshire County Council has acknowledged it is outdated. A draft LTP 4 document was published in 2022, but is yet to be formally adopted. The references within LTP 3 to South Hampshire specific policies are not included within LTP 4. As strategic documents, neither document has specific references to the Scheme, and thus there would be no material change to the assessments undertaken.
Hampshire Cycling Strategy and Hampshire Walking Strategy	East Hampshire Local Cycling and Walking Infrastructure Plan (LCWIP) August 2020 ²¹ , and Havant LCWIP 2023 ²²	The Hampshire Cycling and Walking Strategies that accompanied LTP3 have not been updated for the draft LTP4. The documents have effectively been superseded by LCWIPs for local boroughs. Both LCWIP documents seek to encourage active travel through support for the improvement of walking and cycle networks. The East Hampshire LCWIP does not acknowledge the development of the Havant Thicket scheme. The LCWIP proposes to investigate a cycle route between Horndean and Rowlands Castle, which could route via local roads or potentially the B2149. Given the Scheme access junction on the B2149 was consented and constructed before the LCWIP was published, the use of the B2149 by construction vehicles would be a material consideration in the development of any cycle scheme. The Havant LCWIP acknowledges the development of the Scheme should be taken into consideration as the LCWIP evolves. A network of off road cycle routes is shown around the completed reservoir in the associated network plan.
Havant Borough Local Plan (Core Strategy) (2011), The Havant Borough Local Plan (Allocations) (2014) and Draft Havant Borough Local Plan 2036 (2019)	Havant Borough Local Plan (Core Strategy) (2011); The Havant Borough Local Plan (Allocations) (2014)	At the time of submission of the 2020 ES, Havant Borough Council had consulted on a draft Local Plan which included policy KS8 regarding Havant Thicket reservoir. The draft Local Plan was subsequently withdrawn in April 2022. Havant Borough Council is currently developing an updated Local Plan, however at the current time (Jan 2024) the adopted 2011/14 plans remain current. Havant Thicket reservoir is included as Strategic Site 2 within the 2011/14 documents. A series of infrastructure requirements for Havant Thicket reservoir are noted within the adopted Local Plans, which would have been material considerations when the

²⁰ [Local Transport Plan | Hampshire County Council \(hants.gov.uk\)](https://hants.gov.uk/local-transport-plan/)

²¹ [PowerPoint Presentation \(easthants.gov.uk\)](https://easthants.gov.uk/powerpoint-presentation/)

²² [Havant Local Cycling and Walking Infrastructure Plan \(hants.gov.uk\)](https://hants.gov.uk/havant-local-cycling-and-walking-infrastructure-plan/)

2020 ES Legislation/Policy/Guidance	Current Legislation/Policy/Guidance	Summary of Updates
		planning application was determined and remain a material consideration for the changes proposed within this application.
East Hampshire District Local Plan (2014), Draft East Hampshire District Council Local Plan 2017-2036 (2019)	East Hampshire District Local Plan (2014), Draft East Hampshire District Council Local Plan 2021-2040 (2024),	At the time of submission of the 2020 ES, East Hampshire District Council had consulted on a draft Local Plan which included policy S31 regarding Havant Thicket reservoir. The draft Local Plan has been superseded by more recent drafts. The 2014 Local Plan included allocation of the Havant Thicket site for a new reservoir and would have been a material consideration when the planning application was determined, and remain a material consideration for the changes proposed within this application. Regulation 18 consultation on a new Local Plan has begun in January 2024. Notably the consultation draft does not allocate Havant Thicket reservoir.

12.2.3 With regard to transport policy, the policy tests at the National and Local level have not materially changed from those considered within the 2020 ES.

12.2.4 Neither adopted Local Plan has changed since the 2020 planning application. The Local Plan policies regarding transport infrastructure relating to the Havant Thicket Reservoir have therefore not changed.

12.3 Study Area

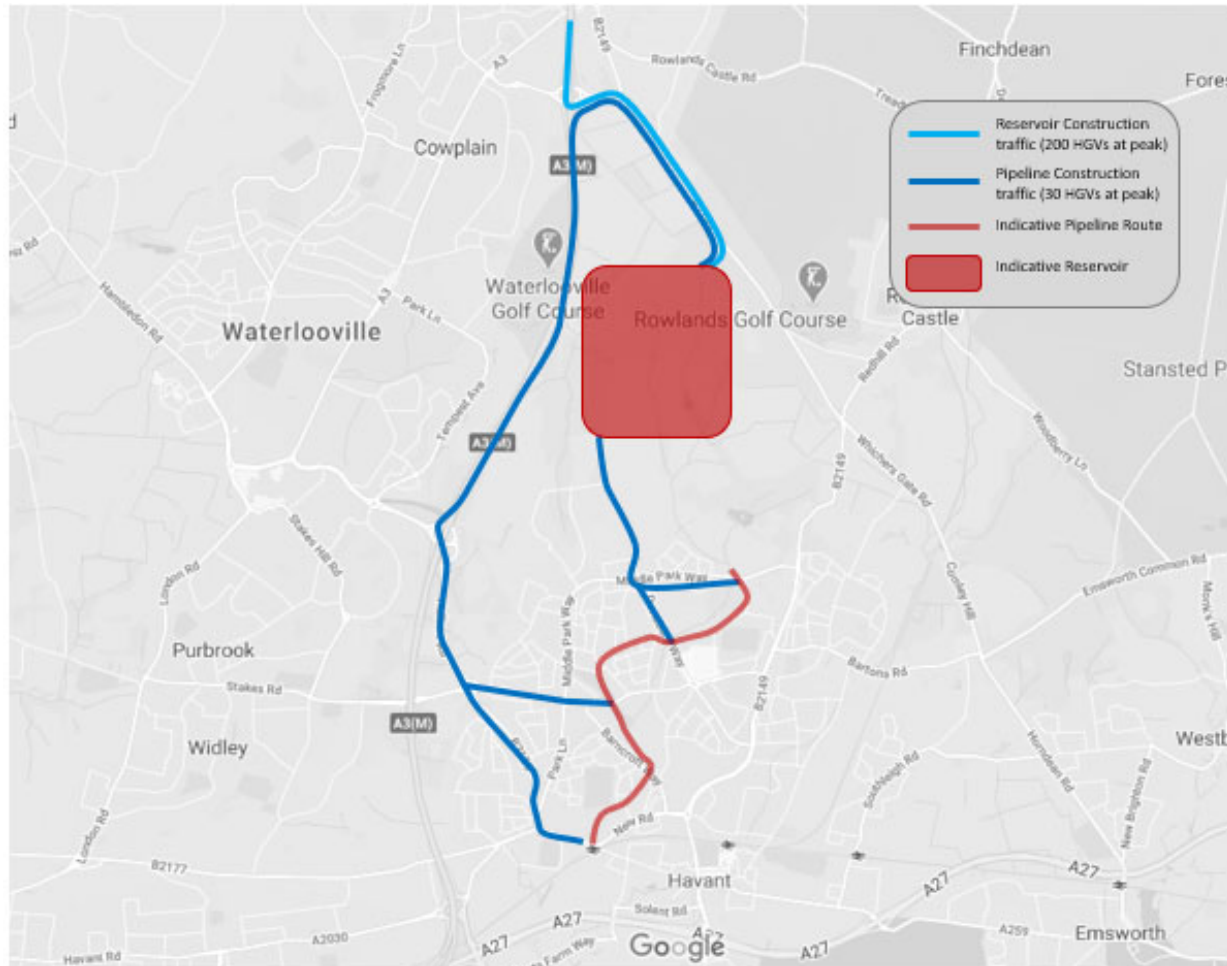
12.3.1 The study area considered in the 2020 ES Chapter 13: Traffic and Transport Chapter extending north of Waterlooville on the A3(M) to Bedhampton in the south. The 2020 ES study area was established to consider the construction impacts of not just the reservoir itself, but also construction of the associated pipeline connection to the south. The study area also allowed consideration of the operational traffic impacts of the local southern access to the reservoir site from Swanmore Road.

12.3.2 The ES Addendum assesses the potential impacts and effects relating to the proposed changes to the Scheme.

12.3.3 **Figure 12-1** shows the expected routing of reservoir construction traffic, as established by the 2020 ES. From **Figure 12-1**, it is apparent that traffic associated with reservoir construction would utilise the B2149 and A3(M) to access the main reservoir works site from the north. Traffic associated with reservoir construction would not utilise local roads to access the site from the south.

12.3.4 On the basis that construction traffic for the main reservoir works site is focussed on the B2149 route to the A3(M), the ES Addendum study area has concentrated on this area from a traffic and transport perspective.

Figure 12-1: Construction Traffic Routes



Source: Figure 13-2, 2020 ES (Vol 2 Chapter 13; Document Reference: HTR-ATK-ZZ-ZZ-RP-Z-0113)

12.4 Assessment Methodology

12.4.1 2020 ES Methodology

12.4.2 The 2020 ES utilised an evidence base approach, including traffic surveys from March 2020 (pre-COVID-19 restrictions), a 2023 future year to represent commencement of construction, and a 2029 future year to represent the earliest year of opening of the reservoir visitor centre. The Department for Transport's (DfT) TEMPro software (version 7.2) was used to establish traffic growth factors from the 2020 baseline to the future years.

- 12.4.3 Construction traffic demand was determined using a ‘first principles’ methodology, reflecting forecast material and personnel requirements to derive vehicle trips. Distribution of construction traffic was based on the routing shown in **Figure 12-1**.
- 12.4.4 Operational demand was forecast based on data from the Queen Elizabeth Country Park, with a gravity model used to determine distribution of trips.
- 12.4.5 The potential effects considered within the 2020 ES include:
- Severance;
 - Driver delay;
 - Pedestrian delay and amenity;
 - Accident and safety; and
 - Fear and intimidation.

ES Addendum Methodology

- 12.4.6 The ES Addendum follows a broadly similar methodology to the 2020 ES, albeit updated to reflect that the principles of the IEMA guidance, which has been updated in the intervening period.
- 12.4.7 Baseline conditions underpinning the 2020 ES have been reviewed in respect of traffic flows and collision data. Open source DfT traffic data has been used to determine changes in traffic flows on the highway network up to 2022. The latest Crashmap data has been used to inform the collision review.
- 12.4.8 To calculate traffic growth factors for the updated future year forecasts, the latest version of TEMPro (8.1) has been used.
- 12.4.9 Contractor information has been used to determine updated construction trip generation, reflecting the proposed changes to the reservoir.
- 12.4.10 The potential effects considered within the ES Addendum remain consistent with the 2020 ES.

12.5 Assessment Assumptions and Limitations

- 12.5.1 The ES Addendum adopts the same assumptions as the 2020 ES, e.g. traffic distribution and assessment years.
- 12.5.2 Limitations regarding the use of data from a variety of sources remain consistent with the 2020 ES, with factors applied to ensure a common baseline.

- 12.5.3 The 2020 ES anticipated a daily maximum of 100 Heavy Goods Vehicles (HGVs) arriving and 100 HGVs departing the reservoir construction site, which is maintained in the ES Addendum.

12.6 Update to Baseline Environmental Conditions

- 12.6.1 A review has been undertaken to ascertain whether the latest available data suggests material changes to baseline environmental conditions from a traffic and transport perspective.
- 12.6.2 Since the 2020 Scheme was consented, the enabling works have begun on site. The new site access junction with the B2149 proposed within the original consent has been constructed and opened to traffic, together with associated upgrades to the access road to the construction site.

Link Sensitivity

- 12.6.3 A review has been undertaken of the current sensitivity of the links associated with reservoir construction, as summarised in **Table 12-2**.

Table 12-2: Review of Reservoir Construction Link Sensitivities

Road Link reference	Description	2020 ES Sensitivity	2024 Sensitivity	Justification
L7	A3(M) junction 2 north slips	Negligible	Negligible	Link characteristics remain as previously assessed.
L8	Dell Piece East between A3(M) and roundabout with B2149	Negligible	Negligible	Link characteristics remain as previously assessed.
L41	A3(M) junction 2 south slips	Negligible	Negligible	Link characteristics remain as previously assessed.
L42	Northern Site Access Road	N/A	Negligible	Road now constructed, as route to accommodate construction and operational traffic associated with the Scheme.
L43	North of Northern Access B2149	Negligible	Negligible	Link characteristics remain as previously assessed.

- 12.6.4 From **Table 12-2**, it is apparent the characteristics of all links existing in 2020 remain the same in 2024. The northern site access road has been upgraded to facilitate the construction of the main reservoir works. The access road does not route past sensitive receptors and is hence defined as having a negligible sensitivity, consistent with all other links in **Table 12-2**.

Background Traffic Flow Review

- 12.6.5 The 2020 ES and TA were informed by traffic surveys undertaken at the beginning of March 2020, just in advance of national lockdowns associated with the COVID-19 pandemic.

- 12.6.6 DfT defines neutral traffic periods to survey as March through to November (excluding August), avoiding school holidays. Based on the DfT guidance it has not been possible to collect representative traffic surveys to inform the ES Addendum. On this basis, a review has been undertaken using available open source traffic data.
- 12.6.7 The DfT road traffic statistics website provides traffic data for motorway, 'A' class and minor roads in Great Britain. A review of the data available on or close to the reservoir construction route identified a series of count locations, as summarised in **Table 12-3**.

Table 12-3: Available DfT Count Data

DfT Count Reference	Description	Data available
16237	A3(M) north of Junction 2	2000 to 2022 traffic flows, including manual counts in 2017, 2020 and 2022.
46066	A3(M) south of Junction 2	2000 to 2022 traffic flows, including manual and automatic counts from 2017 to 2022.
945145	B2149 Durrants Road	2009 manual count

- 12.6.8 From **Table 12-3**, it is apparent that representative traffic flow data is available for the A3(M), however the only data available for the B2149 is both historic (2009), and to the south of the reservoir construction route.
- 12.6.9 **Table 12-4** and **Table 12-5** summarise total vehicle and HGV flows between 2017 and 2022 on the A3(M) to the north and south of junction 2 respectively.

Table 12-4: Annual Average Daily Flows, A3(M) north of Junction 2

Year	Count method	Total vehicles	HGVs	% HGVs
2017	Manual count	56,334	2,067	3.7%
2018	Estimated	56,302	2,401	4.3%
2019	Estimated	56,963	2,167	3.8%
2020	Manual count	47,445	2,616	5.5%
2021	Estimated	54,453	2,607	4.8%
2022	Manual count	52,642	2,563	4.9%

Source: DfT Count Site 16237

Table 12-5: Annual Average Daily Flows, A3(M) south of Junction 2

Year	Count method	Total vehicles	HGVs	% HGVs
2017	Manual count	65,152	2,571	3.9%
2018	Automatic count	62,941	2,541	4.0%
2019	Manual count	64,347	2,271	3.5%
2020	Automatic count	48,866	2,267	4.6%
2021	Manual count	60,873	2,250	3.7%
2022	Automatic count	60,934	2,080	3.4%

Source: DfT Count Site 46066

12.6.10 Review of **Table 12-4** and **Table 12-5** reveals DfT surveyed flows in 2020 were lower than 2019, suggesting the 2020 counts were undertaken during the COVID-19 pandemic. At both locations, the latest 2022 counts observed traffic flows that were still lower than 2019 levels, before the pandemic. North of junction 2 2022 flows were 7.6% lower than 2019, south of junction 2 2022 flows were 5.3% lower than 2019. On the basis of this evidence, it is contended that the use of the pre-pandemic traffic count data in the 2020 ES baseline scenario is robust.

Background Collision Data Review

12.6.11 The 2020 TA was informed by collision data acquired from Hampshire County Council for the period between 1st January 2015 and 31st December 2019. A subsequent review of collisions was undertaken using Crashmap data for the B2149 link north of the site access, and the B2149/Dell Piece East roundabout.

12.6.12 Corresponding Crashmap data was collected for the latest available five-year period (1st January 2018 to 31st December 2022) to allow a comparison of observed collisions. **Table 12-6** and **Table 12-7** summarise the observed collisions on the B2149 link and B2149/Dell Piece East roundabout respectively.

Table 12-6: Comparison of Observed Collisions, B2149 Link

Period	Fatal	Serious	Slight
2015 to 2019	0	1	4
2018 to 2022	0	0	2

Table 12-7: Comparison of Observed Collisions, B2149/Dell Piece East roundabout

Period	Fatal	Serious	Slight
2015 to 2019	0	1	2
2018 to 2022	0	0	2

12.6.13 The number and severity of collisions recorded at both locations summarised in **Table 12-6** and **Table 12-7** has reduced between the 2015-2019 and 2018-2022 periods. On this basis, it is concluded that there has been a reduction in observed collisions, and thus the baseline for the 2020 ES and TA is robust from this perspective.

12.7 Assessment of Potential Impacts during the Construction Phase

12.7.1 The 2020 ES utilised a 2023 future year for the assessment of construction traffic, developed by applying traffic growth to 2020 base year. **Table 12-8** summarises the 2020 baseline presented in the 2020 ES Chapter 13: Traffic and Transport and 2023 forecast traffic flows used within the 2020 ES for the reservoir construction links.

Table 12-8: 2020 Baseline and 2023 Forecast Traffic Flows

ES Road Link	2020 Flow	2023 Flow	% increase
7	10,413	10,951	4.9%
8	20,357	21,408	4.9%
41	18,212	19,153	4.9%
43	12,677	13,331	4.9%
Total	61,659	64,843	4.9%

Source: Table 13-6 2020 ES (Vol 2 Chapter 13; Document Reference: HTR-ATK-ZZ-ZZ-RP-Z-0113)

12.7.2 The 2020 ES assumed an additional 4.9% traffic growth from 2020 surveys for all assessed links for the construction phase assessment, as identified in **Table 12-8**.

12.7.3 Forecast traffic growth data has been extracted from the latest version of TEMPro (8.1) for Hampshire, summarised in **Table 12-9**.

Table 12-9: TEMPro 8.1 Traffic Growth Factors

Years	Growth factor
2022-2023	1.0049
2022-2025	1.0148
2022-2029	1.0598
2022-2031	1.0795

Source: DfT TEMPro 8.1, Hampshire

12.7.4 From **Table 12-9**, the latest version of TEMPro now assumes growth of only 0.5% between 2022 and 2023, with 8.0% traffic growth assumed between 2022 and 2031.

12.7.5 A comparison of the anticipated changes in background traffic expected by the 2023 construction year between the 2020 ES and current observations is provided in **Table 12-10**.

Table 12-10: Comparison of 2023 Forecasts, 2020 ES and 2024 ES Addendum

	2020 ES	ES Addendum
Forecast Increase 2020 to 2023	4.9%	N/A
Observed Change 2019 to 2022	N/A	-5.3%
Forecast Increase 2022 to 2023	N/A	0.5%
TOTAL GROWTH	+4.9%	-4.8%

Note: Observed Changes utilise DfT 2019 (i.e. pre COVID) data.

12.7.6 From **Table 12-10**, the 2020 ES construction scenario considers background traffic flows that are likely to be almost 10% higher than currently experienced on the network. The 2023 future year used within the 2020 ES is therefore considered a robust basis for ongoing assessment of construction impacts.

- 12.7.7 The 2020 ES anticipated a daily maximum of 100 HGVs arriving and 100 HGVs departing the reservoir construction site. Similarly, a daily maximum of 125 cars arriving and 125 departing the reservoir construction site was anticipated.
- 12.7.8 **Chapter 13: Materials Resources and Waste** of this ES Addendum summarises the materials required for the construction of the main reservoir works. **Table 13-3** identifies the updated material quantities now expected. Notably the additional fill material would be sourced from the site rather than imported.
- 12.7.9 From **Table 13-3** of this ES Addendum the greatest additional material import relates to Aggregate/Sand. The maximum annual import of Aggregate/Sand is estimated to be 174,132 tonnes, occurring in 2025. Utilising a 50-week working year, and five working days per week, results in an average import of 697 tonnes per day. Applying a load factor of 20 tonnes per vehicle results in a demand for 35 vehicles per day, well within the 100 anticipated daily HGV trips used in the 2020 ES. The contractor has confirmed that they would not expect to exceed the 100 daily HGV trips anticipated in the 2020 ES.
- 12.7.10 Although there is a change in materials quantities for the construction of the main reservoir works, most of the materials would be sourced from site and any materials required to be imported can be brought to site within the same anticipated daily maximum number of vehicles limits as the 2020 ES.
- 12.7.11 Given the inputs (2023 future baseline and construction traffic) remain consistent with those assessed in the 2020 ES, it is concluded that there will be no change in the resulting impacts.

12.8 Assessment of Potential Impacts during the Operational Phase

- 12.8.1 A review was undertaken of the traffic and transport implications of the proposed changes to the operational phase of the Scheme.

Public Rights of Way

- 12.8.2 The alignment of the bridleway proposed along the foot of the embankment will alter to reflect the revised position of the foot of the embankment. The bridleway will continue to form a continuous loop around the reservoir, retaining the same connections as the consented Scheme. The realignment of the bridleway would have a negligible impact to the users of the Public Rights of Way.

Traffic Demand

12.8.3 The 2020 ES utilised a 2029 future year for the assessment of operational traffic, developed by applying traffic growth to 2020 base year. **Table 12-11** summarises the 2020 baseline and 2029 forecast traffic flows used within the 2020 ES for links within the ES Addendum study area.

Table 12-11: 2020 Baseline and 2029 Forecast Traffic Flows

ES Road Link	2020 Flow	2029 Flow	% increase
7	10,413	11,683	12.2%
8	20,357	22,839	12.2%
41	18,212	20,433	12.2%
43	12,677	14,222	12.2%
Total	61,659	69,177	12.2%

Source: Table 13.6 of 2020 ES (VOL 2 CHAPTER 13; Document Reference: HTR-ATK-ZZ-ZZ-RP-Z-0113)

12.8.4 No change to operational demand is expected from the 2020 ES, therefore the assessment remains valid.

12.9 Design, Mitigation and Enhancement Measures

12.9.1 A Framework Construction Traffic Management Plan (Document Reference: HTR-ATK-XX-XX-RP-Z-0077, Atkins 2021) accompanied the 2020 planning application for the Scheme. Approval and subsequent implementation of the Construction Traffic Management Plan (CTMP) became a condition of planning consent for the Scheme. Version 1.2 of the CTMP (Document Reference: HTR-MRW-CTMP-v1.2) considers the main reservoir works site. The CTMP includes details of:

- Vehicle routing plans;
- Proposed programme and duration;
- Number of construction personnel including travel arrangements and mitigation where necessary;
- Alterations to the highway, including temporary and/or permanent, to enable construction;
- Details of the number of construction and delivery vehicles using the public highway;
- Traffic management details;
- Compounds and laydown area details;
- Highway condition surveys;
- Methods for managing the site to prevent mud onto the highway; and
- Details of on-site contractor parking.

- 12.9.2 The 2020 ES included a commitment to develop a detailed Travel Plan (TP) in advance of operational use of the Scheme. The TP *“will seek to minimise the proportion of visitors using single occupancy car trips and maximise opportunities for attracting visitors on sustainable modes of travel.”*
- 12.9.3 The measures contained within the CTMP and TP are designed/embedded mitigation for the Scheme, to ensure the approval parameters defined within the 2020 planning consent are met. The changes proposed to the Scheme would be reflected in the now live CTMP.

12.10 Assessment of Traffic and Transport Effects

Construction Effects

- 12.10.1 The ES Addendum has identified that there has been no change to the negligible sensitivity of receptors as detailed in **Table 12-2**. Likewise, there has been no change to the magnitude of impacts anticipated during construction of the Scheme, (see **Section 12.7**). On this basis it is concluded that there will be no significant change in effects resultant from construction related activities due to the proposed Scheme changes from traffic and transport perspective.

Operational Effects

- 12.10.2 The ES Addendum has identified that there has been no change to the negligible sensitivity of receptors as detailed in **Table 12-2**. Likewise, there has been no change to the magnitude of impacts anticipated during operation of the Scheme, (see **Section 12.8**). On this basis it is concluded that there will be no significant change in effects resultant from operation of the revised Scheme from traffic and transport perspective.

12.11 Monitoring

- 12.11.1 Monitoring of the construction traffic and traffic impacts of the Scheme is undertaken through updates to the CTMP. It is expected this monitoring regime continues with amendments to the Scheme.
- 12.11.2 The operational TP for the Scheme is expected to annually monitor visitor travel behaviour to minimise the proportion of visitors using single occupancy car trips and maximise opportunities for visitors to use sustainable modes of travel.

12.12 Summary

- 12.12.1 This chapter of the ES Addendum has considered the traffic and transport implications of the proposed changes to the Scheme.

- 12.12.2 Whilst legislation and guidance has evolved since the 2020 ES, none of the changes make a material difference to the assessments undertaken.
- 12.12.3 Review of the baseline conditions identified that traffic flows are yet to return to the pre-pandemic levels used within the 2020 ES and TA. A review of the latest collision data identified a reduction in the severity and number of collisions recorded over the latest five-year period. On this basis it is concluded that the baseline used in the 2020 ES and TA remains robust.
- 12.12.4 A CTMP has been implemented for the Scheme, and will be required to cover the proposed Scheme changes. A TP will be developed to manage operational travel impacts. The ES Addendum assessments have been undertaken on the basis that the measures within the CTMP and future TP will continue to be implemented.
- 12.12.5 Whilst consent is sought to alter the design of the reservoir embankment, construction of the altered Scheme can be undertaken within the same anticipated daily maximum vehicular traffic as the 2020 ES. The 2023 future baseline used to assess construction impacts in the 2020 ES remains robust. The traffic impact and consequent effects of construction thus remains consistent with that assessed in the 2020 ES.
- 12.12.6 The proposed alterations to the reservoir embankment will not make a material change to the operation of the Scheme from a traffic and transport perspective. The 2029 future baseline used to assess operational impacts in the 2020 ES remains robust. The traffic impact and consequent effects of operation thus remains consistent with that assessed in the 2020 ES.

13 Material Resources and Waste

13.1 Introduction

13.1.1 This chapter has been prepared based on a review of the 2020 ES Chapter 14: Material Resources and Waste assessment (Vol 2 Chapter 14; Document Reference: HTR-ATK-ZZ-ZZ-RP-Z-0114) with consideration for the proposed changes to the Scheme.

13.1.2 Material and waste quantities have been reviewed in light of the changes to the design and an updated profile provided.

13.2 Competent Expert Evidence

13.2.1 This chapter has been prepared by a Waste and Materials Resources specialist with 25 years' experience in waste and environmental projects. The expert is a Senior Environmental Consultant and Member of the Chartered Institution of Wastes Management and an associate of IEMA.

13.3 Review of Legislative and Policy Framework

13.3.1 **Table 13-1** provides a summary of changes to relevant legislation, policy and guidance relevant to material resources and waste since the publication of the 2020 ES.

Table 13-1: Summary of changes to legislation, policy and guidance relevant to material resources and waste

2020 ES Legislation/Policy/Guidance	Current Legislation/Policy/Guidance	Summary of Updates
National		
NPPF 2019	NPPF December 2023	The new NPPF published in December 2023 refers to the importance of substituting recycled materials before the extraction of primary raw materials.
Draft NPSWRI 2018	NPSWRI	Relevant to new applications, the NPSWRI requires applicants to set out the arrangements that are proposed for managing any waste produced in the application for development consent. The applicant should prepare a Site Waste Management Plan (SWMP) and Materials Management Plan (MMP) where relevant. The arrangements in the plan should include information on the proposed waste recovery and disposal system for all waste generated by the development and should also include details of the alternatives that have been considered.
Waste Management Plan for England 2013	Waste Management Plan for England 2021 ²³	The Waste Management Plan for England 2021 supersedes the previous waste management plan for England published in 2013. It provides an overview of waste management in England. The plan includes changes to waste management plan requirements which have been made by the Waste (Circular Economy) (Amendment) Regulations.
N/A	Waste prevention programme for England: Maximising	Maximising Resources, Minimising Waste constitutes the new Waste Prevention Programme for England. It sets out the priorities for action to manage England's resources and

²³ [Waste Management Plan for England \(publishing.service.gov.uk\)](https://www.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/115555/waste-management-plan-for-england-2021.pdf)

2020 ES Legislation/Policy/Guidance	Current Legislation/Policy/Guidance	Summary of Updates
	Resources, Minimising Waste, 2023 ²⁴	waste in accordance with the top layers of the waste hierarchy - prevention and reuse. The waste prevention programme sets out the circular economy approach which retains products and materials in circulation for as long as possible and at their highest value.
Local		
Not included in the 2020 ES	Havant Borough Council Local Plan 2036	The Havant Borough Local Plan 2036 plan was withdrawn from examination on 16 th March 2022. A new Local Plan, 'The Building a Better Future Plan', is currently in development.
Hampshire Minerals and Waste Plan 2013	Hampshire Minerals and Waste Plan	The Hampshire Minerals and Waste Plan that was adopted in 2013 is in the process of being updated and a Partial Update Draft Plan was consulted on in January 2024.
Not included in the 2020 ES	East Hampshire District Draft Local Plan (2021 – 2040)	The East Hampshire District Draft Local Plan contains two policies which are relevant to material resources and waste: - CLIM3 – Net-Zero Carbon Development: Embodied Emissions; and - NBE13 – Protection of Natural Resources. CLIM3 highlights the circular approach to development, as part of a low-waste, circular economy. NBE13 ensures that new developments will use natural resources prudently, maintaining and conserving them where appropriate, whilst encouraging their reuse or recycling to avoid waste.

13.4 Study Area

- 13.4.1 The study area for materials and waste remains the same as defined in the 2020 ES and is based on the red line boundary for the Scheme and the wider study areas for materials of South East England and the Hampshire Waste Planning Authority area for waste.

13.5 Assessment Methodology

- 13.5.1 The methodology has not changed since the completion of the 2020 ES therefore the assessment methodology remains current.

13.6 Assessment Assumptions and Limitations

- 13.6.1 The assumptions in the 2020 ES have been reviewed and comments on these are included in **Table 13-2** below.

²⁴ [The waste prevention programme for England: Maximising Resources, Minimising Waste - GOV.UK \(www.gov.uk\)](https://www.gov.uk/government/publications/waste-prevention-programme-for-england)

Table 13-2: Review of assumptions from 2020 ES

Assumption in 2020 ES Chapter 14: Material Resources and Waste	Comment/Revised Assumption
The assessment is based on the principle that the embankment, wetland retention structure, clay blanket (Bognor Sand Member) and clay cut-off (Harwich Formation) are primarily constructed using site-won materials from the reservoir site.	Assumption remains, site-won materials are primarily used in construction.
The quantities assessed are based on a reasonable worst-case design. This includes upstream embankment slopes with a 1:7 gradient and construction of both the north and south option access roads at the reservoir site.	The quantities have been updated to reflect the proposed Scheme changes.
Construction of the embankments, reservoir infrastructure (including culvert, valve access shaft, spillway and control house) and access roads has been assumed to take place between 2021 and 2026.	Construction programme for the main works is assumed to take place between 2024 and 2028.
A preliminary construction programme has been used to inform the materials and waste assessments.	Assumed to be the same across the 5 years.
Unused construction materials and equipment will be fed back into the supply chain for use on alternative schemes and as such will be excluded from the assessment.	No change.
Material and waste quantities have been converted into tonnes using conservative industry standard conversion rates.	Same approach adopted.
All construction material estimates are grouped into high-level categories for the purpose of the assessment.	No change.
It is assumed that soils used will be site-won. Therefore, soils have not been assessed against a baseline.	No change.
The estimated quantities of construction materials and waste presented in this chapter are rounded to three significant figures.	No change.

13.6.2 The limitations set out in the 2020 ES remain valid.

13.7 Update to Baseline Environmental Conditions

13.7.1 The baseline has not been updated for this chapter as a revised impact assessment is not required.

13.8 Assessment of Effects

13.8.1 The data presented in the 2020 ES Chapter 14: Material Resources and Waste for the types and quantities of materials used and wastes generated during the construction phase were previously estimated and the annual quantities indicated. These quantities have been re-profiled based on the proposed Scheme changes, and provided in **Table 13-3**.

Table 13-3: Reservoir site including access roads estimated material quantities. Updated baseline.

Date	Key Construction Materials	Estimated Quantity (per year)										Comments
		2021	2022	2023	2024	2025	2026	2027	2028	Total (m³)	Total (tonnes)	
2020 ES (Table 14-8)	Aggregate/rock	12,800	50,700	50,700	25,700	-	-	-	-	139,900	279,800	Although Table 14-8 in the 2020 ES states that the quantities presented are in tonnes, the values are in volumes (m³). Conversion factors have been used to present the data in tonnes*.
	Asphalt	5,340	-	-	-	-	-	-	-	5,340	11,978	
	Concrete	-	3,930	4,730	52	-	-	-	-	8,712	20,909	
	Fill Materials (site-won)	1,820	204,000	438,000	438,000	438,000	345,000	-	-	1,864,820	3,543,158	
	Steel	-	-	220	-	-	-	-	-	220	1,727	
2024 ES Addendum	Aggregate/rip rap	-	-	-	-	-	-	61,233	30,159	N/A	91,392	Greater split of material types
	Aggregate/sand	-	-	-	-	174,132	138,464	109,354	32,599	N/A	454,549	Increased quantity
	Aggregate/MOT T1	-	-	10,503	-	4817	-	-	3874	N/A	19,194	New material split out
	Asphalt	-	-	1,668	1,210	2,624	-	-	-	N/A	5,502	Increased quantity
	Concrete	-	-	-	5,644	9,406	3,762	-	-	N/A	18,812	Increased quantity
	Fill Materials (site-won)	-	-	-	280,250	2,284,609	1,841,373	1,657,424	494,088	N/A	6,557,745	Large increased quantity
	Steel	-	-	-	734	1,223	489	-	-	N/A	2,446	Increased quantity

Note: Revised estimates to inform the ES Addendum were provided by Future Water on 10th April 2024.

*2020 ES figures converted to tonnes from m³. The conversion factors used: Aggregate/rock 2 T/m³; Asphalt 2.24 T/m³; Concrete 2.4 T/m³; Fill Materials (site-won) 1.9 T/m³; and Steel 7.85 T/m³.

- 13.8.2 The data on specific materials presented in **Table 13-3** provides revised quantities and planned year of transfer. A wider range of materials is now included, splitting out aggregates into the different components. The quantities for aggregate/sand have increased, as previously the combined aggregate/rock category had a total quantity of 279,800 tonnes, whereas the revised estimate is now 454,549 tonnes just for sand. These materials will be imported to the site.
- 13.8.3 The estimated quantity of fill material that is site-won and proposed to be used within the engineering works of the Scheme has increased from 3,543,158 tonnes (reported in the 2020 ES) to 6,557,745 tonnes. It is assumed that all of this excavated material will remain on site (as noted in **Table 13-3**) and will be used within the engineered design or for landscaping.
- 13.8.4 The changes in the annual quantities and associated vehicle movements within the Scheme boundary related to the increased quantities of materials will be considered in other topics as these changes may affect other assessments including the following:
- Air Quality (**Chapter 6**);
 - Noise and Vibration (**Chapter 11**);
 - Traffic and Transport (**Chapter 12**); and
 - Effect on Climate (**Chapter 15**).
- 13.8.5 The construction, demolition and excavation (CDE) waste quantities are presented in **Table 13-4** which show the re-profiled timings of waste generation. We have assumed that the quantities of these non-hazardous wastes have not changed and therefore the impact assessment undertaken in the 2020 ES does not require updating.

Table 13-4: Reservoir site including access roads estimated CDE waste quantities: Updated baseline.

Date	Key Waste Types	Estimated Quantity (tonnes) per year								
		2021	2022	2023	2024	2025	2026	2027	2028	Total
2020 ES	Asphalt	92	-	-	-	-	-	-	-	92
2024 ES Addendum	Asphalt	-	-	-	92	-	-	-	-	92

13.9 Assessment of Potential Impacts during the Construction Phase

- 13.9.1 The potential impacts from materials and waste have not been re-assessed, as the direct and indirect impacts that were identified in the 2020 ES remain valid. It is recognised that the quantities of materials have increased, however the implications of these changes are considered in other topics.

13.10 Assessment of Potential Impacts during the Operational Phase

- 13.10.1 The potential impacts during the operational phase were not considered within the 2020 ES and are not considered here.

13.11 Design, Mitigation and Enhancement Measures

- 13.11.1 The design, mitigation and enhancement measures detailed in the 2020 ES Chapter 14: Material Resources and Waste and Appendix 14.1: Materials Management Strategy (Vol 4 Appendix 14.1; Document Reference: HTR-ATK-ZZ-ZZ-RP-Z-0139) remain relevant and no further mitigation measures are required.

13.12 Assessment of Effects

- 13.12.1 The effects have not changed since the publication of the 2020 ES, therefore the classification presented in the 2020 ES assessment remains valid based on the materials and wastes included.

13.13 Monitoring

- 13.13.1 The monitoring requirements have not changed since the completion of the 2020 ES therefore the assessment remains current. An SWMP and MMP will be developed and implemented for the construction phase as set out in the REAC (Vol 4 Appendix 2; Document Reference: HTR-ATK-XX-XX-RP-Z-0069) and further estimates of the quantities of materials and wastes developed.

13.14 Summary

- 13.14.1 It is considered that the 2020 ES is still relevant and appropriate for materials and waste in relation to the proposed changes to the Scheme, therefore the assessment remains relevant.

14 Water

14.1 Competent Expert Evidence

- 14.1.1 This chapter has been prepared based on a review of the 2020 ES Chapter 15: Water (Vol 2 Chapter 15; Document Reference: HTR-ATK-ZZ-ZZ-RP-Z-0115) with consideration for the proposed changes to the Scheme by a competent expert who is a Chartered Geomorphologist and Fellow of the Royal Geographical Society, with 20 years' experience in the preparation of Environmental Impact Assessments for the water environment, who has used his knowledge and professional judgement to complete the review.

14.2 Review of Legislative and Policy Framework

- 14.2.1 The legislation and policy listed in Table 15-1: Legislation, regulatory, and policy framework for the Water assessment of the 2020 ES have remained unchanged, except for the following additional policies described in **Table 14-1** below.

Table 14-1: Updated legislation, policy and guidance

2020 ES Legislation/Policy/Guidance	Current Legislation/Policy/Guidance	Summary of Updates
National		
NPPF 2019	NPPF December 2023	The NPPF 2023 has replaced the NPPF 2019 following the update issued on 19th December 2023. Changes to the NPPF place a greater emphasis on sustainable development and making 'beautiful' and 'sustainable' places, require the consideration of 'all sources of flood risk' in the location of development and the use of green infrastructure and natural flood management.
Draft NPSWRI 2018	NPSWRI April 2023	The NPSWRI was designated in September 2023, following consultation on the Draft Policy Statement. The relevant sections are Section 4.7 Flood Risk and Section 4.15 Water Quality and Resources. Changes in these sections include: • Specific reference to the ability of reservoirs to assist in flood risk management; • Highlighting the potential for operational adaptations to enhance local flood risk management; • Inclusion of the potential requirement for offsite mitigation such as securing land for flood storage/conveyance; • Specification that Flood Risk Assessments (in addition to Environmental Statements) must identify appropriate mitigation measures and how these will be secured; • Text stating that water companies are expected to deliver water environment improvements; • Reference to duties under the Environment Act 2021; and • Inclusion of the need for the Secretary of State to refuse permissions for a project that is likely to cause deterioration or failure to achieve good status or potential, unless exempt due to imperative reasons of overriding public interest.

2020 ES Legislation/Policy/Guidance	Current Legislation/Policy/Guidance	Summary of Updates
		The changes do not materially affect the proposed development as they are in line with NPPF and Water Framework Directive (WFD).
National Planning Practice Guidance (NPPG) 2019	NPPG 2024	Several sections of the NPPG have been updated to reflect the NPPF. Of relevance to the water environment are the changes to the Flood Risk and Coastal Change guidance (2022). These changes include updated definitions, enhanced guidance on the consideration of flood risk and improved guidance on sustainable drainage systems and natural flood management.
Various	Floods and Water (Amendment etc.) (EU Exit) Regulations 2019	These Regulations ensure that the legislation in related to floods and water continue to operate following the UK's withdrawal from the EU. They do this by making amendments to four pieces of primary legislation (Water Act 1989, Water Industry Act 1991, Water Resources Act 1991 and Water Act 2014) and 17 pieces of secondary legislation, including the Water Environment (Water Framework Directive) (England and Wales) Regulations 2017. The changes primarily relate to referring to EU obligations and directives as 'retained' and the transfer of responsibility from the European Commission to the Office for Environmental Protection.
The Conservation of Habitats and Species Regulations 2017	The Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019	The 2019 Regulations amend the 2017 Regulations to account for the UK's withdrawal from the EU. Changes primarily relate to transfer of functions from the European Commission to the appropriate authorities in England and Wales and creation of a UK national site network instead of the European Natura 2000 network. The objectives of the Regulations remain unchanged and competent authorities are still required to undertake an assessment of the potential for plans or projects to have 'likely significant effect' on sites designated under the Habitats Directive, Birds Directive or directly under the Regulations. The 'Dutch Nitrogen Case' ruled that where an internationally important site (i.e. Special Protection Area (SPA), Special Area of Conservation (SAC) and Ramsar Sites) is failing to achieve the required condition due to nutrient pollution, the potential for a new development to add to the nutrient load is "necessarily limited". This has informed the way in which the Conservation of Habitats and Species Regulations 2017 (as amended) should apply to pollution related pressures and incidents, and informs the impact assessment regarding sensitivity of water environment receptors.
Environment Bill (likely implementation in 2021 but currently under development)	Environment Act 2021	The Environment Bill received Royal assent in November 2021 and is now the Environment Act 2021. This does not replace or revoke the Environment Act 1995 but strengthens and enforces the adoption of environmental provisions. Part 5 of the 2021 Act relates to water and makes several amendments to the Water Industry Act 1991 specifically regarding water resources management plans and drainage and sewerage management plans, and the inclusion of a new section on storm overflows.
Water Framework Directive (WFD) Regulations Cycle 2 Classifications	Water Framework Directive (WFD) Regulations Cycle 3 Classifications	Chapter 15: Water of the 2020 ES reported baseline water body status based on the most recent interim WFD classification available at the time (Cycle 2 2016). Cycle 3 data (2019 and 2022) are now available on the Environment Agency Catchment Data Explorer ²⁵ and have been used to

²⁵ Environment Catchment Data Explorer (<https://environment.data.gov.uk/catchment-planning/>)

2020 ES Legislation/Policy/Guidance	Current Legislation/Policy/Guidance	Summary of Updates
		update the water quality baseline (Section 14.6). The updated classifications do not alter baseline water quality. The overall status of all surface water bodies in the study area has not changed. The status of the East Hants Lambeth Group groundwater body has improved from Poor in 2016 to Good in 2019.
Local		
Not included in the 2020 ES	Havant Borough Council Local Plan 2036	The Havant Borough Local Plan 2036 plan was withdrawn from examination on 16 th March 2022. A new Local Plan, 'The Building a Better Future Plan', is currently in development. Until the new plan is adopted the existing Core Strategy and Allocation Plans remain in place.
Not included in the 2020 ES	East Hampshire District Draft Local Plan (2021 – 2040)	Our Local Plan 2021-2040 (Draft) was published by East Hampshire District Council for consultation in January 2024. Among others, the draft plan contains policies on: Managing Flood Risk; Water Quality, Supply and Efficiency; and Water Quality Impact on the Solent International Sites.

14.3 Study Area

- 14.3.1 The proposed changes to the Scheme lie within the planning application boundary presented in the 2020 ES. The study area for the assessment remains unchanged and encompasses the surface water catchments of Hermitage Stream, the River Lavant (Hants) and Langstone Harbour. The study area also covers the groundwater catchments of the East Hants Lambeth Group, South Hants Lambeth Group and East Hants Chalk. The 2020 ES study area is shown Chapter 15: Water Figures of the 2020 ES (Vol 3 Chapter 15; Document Reference: APP_20_00990-ES_VOL_3_CHAPTER_15_WATER_FIGURES).

14.4 Assessment Methodology

- 14.4.1 The methodology remains unchanged from the 2020 ES.

14.5 Assessment Assumptions and Limitations

- 14.5.1 The assessment assumptions and limitations remain unchanged from the 2020 ES. No additional surveys or data requests (i.e. for abstractions and discharges) have been undertaken for use in this chapter of the ES Addendum. Updated published data sources have been used for assessing baseline water quality (i.e. River Basin Management Plan Cycle 3 update from the Catchment Data Explorer).

14.6 Update to Baseline Environmental Conditions

Surface Water

Water Body Status

- 14.6.1 Chapter 15: Water of the 2020 ES reported water body status based on the most recent interim WFD classification available at the time (2016). As data from 2016 did not cover all determinands quoted, data from previous classifications (2014 and 2015) were used. Baseline conditions were reported for Hermitage Stream (GB107042016370), Lavant (Hants) (GB107042016420) and Langstone Harbour (GB580705130000). **Table 14-2** and **Table 14-3** show comparisons of water body data using the original 2016 data presented in the 2020 ES Chapter 15: Water and updates in 2019 and 2022.
- 14.6.2 For all surface water bodies the overall baseline ecological status has remained the same between 2016 and 2022 (**Table 14-2** and **Table 14-3**). The baseline biological status and status of individual biological classification items (which were not included in the 2020 ES), have also remained the same except for Langstone Harbour. The overall biological status of Langstone Harbour deteriorated from Good in 2016 to Moderate in 2019 and 2022. This appears to be due to the addition of angiosperms (saltmarsh) in the 2019 update, which are at Moderate status. The Reason for Not Achieving Good (RNAG) classification for angiosperms is listed as coastal squeeze by the Environment Agency (as reported on the Environment Agency Catchment Data Explorer).
- 14.6.3 The majority of individual physico-chemical quality element classification elements are also unchanged, although for Hermitage Stream pH reduced from High to Moderate between 2016 and 2019 and remained Moderate in 2022. The RNAG for pH in Hermitage Stream are listed as 'misconnections' and 'urban development' by the Environment Agency. Temperature also reduced from High to Good between 2016 and 2019, but then improved to High in 2022. In addition, Chapter 15: Water of the 2020 ES did not present data for the Langstone Oyster Beds (GB510070073000) transitional water body, which is in Langstone Harbour. The artificial water body was at Good ecological potential in 2016 and 2019 (there was no update for this water body in 2022). The major change in baseline water quality between 2016 and 2019 is the deterioration from Good to Fail for chemical status. This scenario applies to all water bodies in England and is related to a group of global pollutants (polybrominated diphenyl ethers (PBDEs), a group of brominated flame retardants; mercury; certain polycyclic aromatic hydrocarbons (PAHs) and Perfluorooctane sulfonate (PFOS), a group of per-and polyfluoroalkyl substances (PFAS)). No feasible technical solution exists to remove these chemicals entirely and that they will take time to naturally drop to required levels – 2040 and 2063 are listed as the objective date for natural recovery for Hermitage Stream, Lavant (Hants), Langstone Harbour and Langstone Oyster Beds.

- 14.6.4 Apart from the impact of global pollutants affecting the chemical status of all surface water bodies described above, the main pressures on water quality remain the same in 2019 and 2022 compared to 2016. In Hermitage Stream's catchment, water quality pressures are due to point source pollution (misconnections), which is affecting invertebrates, phosphate and pH, and physical modifications associated with flood protection structures, barriers to ecological continuity and urban development, which are affecting fish, pH and invertebrates.
- 14.6.5 In addition, Hermitage Stream is designated as a heavily modified water body. The Environment Agency's Catchment Data Explorer states that the Mitigation Measures defined within the South East River Basin Management Plan are not yet in place to mitigate the impacts of physical modifications. In the Lavant (Hants) catchment, pressures are caused by physical modifications (barriers to ecological continuity and urban development), which are affecting fish in the catchment. In Langstone Harbour's catchment the main pressures on the water environment are from physical modifications (coastal squeeze), which are affecting angiosperms, and Mitigation Measures that are not properly in place to mitigate the impacts of physical modifications.
- 14.6.6 In Chapter 15: Water of the 2020 ES, water quality data from Portsmouth Water, covering the period 2008 to 2020, was analysed and reported for the catchments shown in **Table 14-2** and **Table 14-3**. Data was processed in line with the methodology described in the 2015 WFD Directions²⁶ to give the equivalent status of the relevant water body classification elements. No further data has been assessed in this addendum but the most recent update to the Environment Agency Catchment Data Explorer includes data up to 2022. It is therefore unlikely that further water quality analysis would materially change the status of the water bodies being assessed.

Groundwater

Groundwater Body Water Quality

- 14.6.7 Chapter 15: Water of the 2020 ES reported groundwater body status based on the most recent interim WFD classification available at the time (i.e. 2016). Baseline conditions were reported for the East Hants Chalk (GB40701G502700), South Hants Lambeth Group (GB40702G503700) and East Hants Lambeth Group (GB40702G500800) groundwater bodies. **Table 14-4** shows a comparison of water body data using the original 2016 data presented in the 2020 ES Chapter 15: Water, and the 2019 update. Note that the status of the groundwater body was not updated in 2022. The only change in baseline conditions for the three groundwater bodies is in the East Hants Lambeth Group, where the overall status and quantitative status have improved from Poor in 2016 to Good in 2019.

²⁶ [The Water Framework Directive \(Standards and Classification\) Directions \(England and Wales\) 2015 \(legislation.gov.uk\)](#)

Table 14-2: Hermitage Stream and Lavant (Hants) updated baseline water body water quality 2016 – 2022

Parameter	Hermitage Stream (GB107042016370)			Lavant (Hants) (GB107042016420)		
	2016 (2020 ES)	2019	2022	2016 (2020 ES)	2019	2022
Ecological status	Moderate	Moderate	Moderate	Poor	Poor	Poor
Biological quality elements	Poor	Poor	Poor	Poor	Poor	Poor
Fish	Poor	Poor	Poor	Poor	Poor	Poor
Invertebrates	Moderate	Moderate	Moderate	High	High	High
Physico-chemical quality elements	Moderate	Moderate	Moderate	High	High	High
Acid Neutralising Capacity	High	High	High	N/A	N/A	N/A
Ammonia	High	High	High	High	High	High
Biochemical Oxygen Demand	High	High	High	N/A	N/A	N/A
Dissolved Oxygen	High	High	High	High	High	High
pH	High	Moderate	Moderate	High	High	High
Phosphate	Moderate	Moderate	Moderate	High	High	High
Temperature	High	Good	High	High	High	High
Hydromorphological supporting elements	Supports Good	Supports Good	Supports Good	Supports Good	Supports Good	Supports Good
Hydrological Regime	Supports Good	Supports Good	Supports Good	Supports Good	Supports Good	Supports Good
Morphology	N/A	N/A	N/A	Supports Good	Supports Good	Supports Good
Specific pollutants	High	High	High	N/A	N/A	N/A
Triclosan ²⁷	High	High	High	N/A	N/A	N/A

²⁷ 2014 status High

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Parameter	Hermitage Stream (GB107042016370)			Lavant (Hants) (GB107042016420)		
	2016 (2020 ES)	2019	2022	2016 (2020 ES)	2019	2022
Copper ²⁷	N/A	High	High	N/A	N/A	N/A
Zinc ²⁷	N/A	N/A	N/A	N/A	N/A	N/A
Chemical	Good	Fail	Does not require assessment	Good	Fail	Does not require assessment
Priority substances ²⁸	Does not require assessment	Good	Does not require assessment	Does not require assessment	Good	Does not require assessment
Lead and its compounds ²⁸	N/A	N/A	N/A	N/A	N/A	N/A
Nickel and its compounds ²⁸	N/A	N/A	N/A	N/A	N/A	N/A
Other Pollutants	Does not require assessment	Does not require assessment	Does not require assessment	Does not require assessment	Does not require assessment	Does not require assessment
Priority hazardous substances	Good	Fail	Does not require assessment	Does not require assessment	Fail	Does not require assessment
Cadmium and its compounds ²⁸	N/A	N/A		N/A	N/A	
Di(2-ethylhexyl)phthalate (Priority hazardous) ²⁸	N/A	N/A		N/A	N/A	
Nonylphenol ²⁸	Good	Good		N/A	N/A	
Tributyltin Compounds ²⁸	N/A	N/A		N/A	N/A	

²⁸ 2014 status Good

Table 14-3: Langstone Harbour updated baseline water body water quality 2016 – 2022

Parameter	Langstone Harbour (GB580705130000)		
	2016 (2020 ES)	2019	2022
Ecological	Moderate	Moderate	Moderate
Biological quality elements	Good	Moderate	Moderate
Angiosperms	N/A	Moderate	Moderate
Saltmarsh	N/A	Moderate	Moderate
Invertebrates	Good	Good	Good
Infaunal Quality Index	Good	Good	Good
Macroalgae	Good	Good	Good
Opportunistic Macroalgae	Good	Good	Good
Phytoplankton	N/A	High	High
Physico-chemical quality elements	Good	Good	Good
Dissolved inorganic Nitrogen	Good	Good	Good
Dissolved Oxygen	High	High	High
Specific pollutants	N/A	N/A	N/A
Arsenic ²⁹	N/A	N/A	N/A
Copper ²⁹	N/A	N/A	N/A
Zinc ²⁹	N/A	N/A	N/A
Hydromorphological supporting elements	Supports Good	Supports Good	Supports Good

²⁹ 2014 status High

Parameter	Langstone Harbour (GB580705130000)		
	2016 (2020 ES)	2019	2022
Hydrological regime	Supports Good	Supports Good	Supports Good
Chemical	Good	Fail	Does not require assessment
Priority substances ³⁰	Does not require assessment	Good	Does not require assessment
Fluoranthene ³⁰	N/A	Good	
Lead and its compounds ³⁰	N/A	Good	
Nickel and its compounds ³⁰	N/A	Good	
Other Pollutants	Does not require assessment	Good	Does not require assessment
Priority hazardous substances	Good	Fail	Does not require assessment
Benzo(a)pyrene ³⁰	N/A	Good	
Cadmium and its compounds ³⁰	N/A	Good	
Hexachlorobenzene	Good	Good	
Hexachlorobutadiene	Good	Good	
Mercury and its compounds ³¹	N/A	Fail	

³⁰ 2014 status Good

³¹ 2014 status Fail

Table 14-4: Baseline groundwater body status 2016 – 2019

Groundwater body	Overall status		Quantitative status element		Chemical status element		Overall objective	
	2016	2019	2016	2019	2016	2019	2016	2019
East Hants Chalk GB40701G502700	Poor	Poor	Poor	Poor	Poor	Poor	Poor	Good
South Hants Lambeth Group GB40702G503700	Good	Good	Good	Good	Good	Good	Good	Good
East Hants Lambeth Group GB40702G500800	Poor	Good	Poor	Good	Good	Good	Good	Good

14.7 Designated Sites

14.7.1 As described in the 2020 ES Chapter 15: Water, nationally and internationally designated sites are associated with Langstone Harbour, which has the following environmental designations:

- Langstone Harbour Site of Special Scientific Interest;
- Chichester and Langstone Harbour Special Protection Area;
- Solent Maritime Special Area of Conservation;
- Chichester and Langstone Harbour Ramsar Site; and
- Langstone Harbour shellfish water.

14.7.2 The condition of these designated sites is as described in the 2020 ES.

14.8 Receptor Importance

14.8.1 As described in the **Sections Surface Water** and Groundwater, baseline water quality is predominantly unchanged from the 2020 ES, with the exception of the reduction in surface water chemical status for all water bodies due to concentrations of global pollutants. This does not change receptor importance (the overall ecological status of all surface water bodies is unchanged since the 2020 ES), and as such the importance of the receptors.

14.8.2 Receptor importance for groundwater resources was mainly high or very high in the 2020 ES, so the improvement in overall status from Poor to Good for the East Hants Lambeth Group groundwater body will not change receptor importance. Groundwater resources assessed as low importance in the 2020 ES were headwater areas situated outside of designated groundwater bodies and these low importance areas remain unchanged by the improvement in groundwater status.

14.9 Assessment of Potential Impacts during the Construction Phase

14.9.1 The potential construction impacts assessed in Chapter 15: Water of the 2020 ES are shown in **Table 14-5**. Study sections 1 and 3 would be affected by the proposed changes to the Scheme. In the 2020 ES study section 1 is defined as Headwater Streams 1, 2 and 3 up to the reservoir site footprint, and study section 3 is defined as Riders Lane Stream between the reservoir footprint up to Hermitage Stream confluence, including The Lake Stream joining Riders Lane Stream from Leigh Lake. An updated assessment has been made and the original significance of effect reassessed, therefore. The significance of effect for all impacts remains the same as the 2020 ES.

- 14.9.2 The potential construction impacts assessed in Chapter 15: Water of the 2020 ES are shown in **Table 14-5**. Study sections 1 and 3 would be affected by the proposed changes to the Scheme. An updated assessment has been made and the original significance of effect reassessed.

14.10 Assessment of Potential Impacts during the Operational Phase

- 14.10.1 For operational impacts the 2020 ES unmitigated significance of effect and significance following mitigation are shown because for most operational impacts there is no mitigation (or effects are positive). As described in **Table 14-6**, significance of effect for all impacts remains the same as the 2020 ES.

Table 14-5: Updated significance of effect (construction).

Receptor	Type of Impact	Study Section	2020 ES Significance Following Mitigation	Addendum Assessment	Addendum Effect
Water quality	Changes to water quality	3, 5, 6	Negligible	No change	Negligible
	Pollution	2	Negligible		Negligible
Hydro morphology	Habitat loss	2	Moderate	It is anticipated that the only changes to the impacts described in the 2020 ES would be for hydromorphology. Extension of the reservoir embankment would result in a larger embankment footprint and a longer culverted section of Riders Lane Stream beneath the embankment. However, the area of channel and floodplain that will be covered by the changes to the embankment would have been lost within the footprint of the reservoir, as assessed in the 2020 ES. The proposed changes to the embankment design are therefore not expected to result in any additional loss of hydromorphological elements of Riders Lane Stream.	Moderate
	Habitat connectivity	1, 2	Moderate		Moderate
	Changes to hydrology	2, 3	Minor		Minor
	Changes to river geo morphology	1, 2, 3	Moderate (1, 2), Major (3)		Moderate (1, 2), Major (3)
Flood risk	Fluvial/tidal flood risk	-/-	-/-	No change	-/-
	Surface water flood risk	2	Negligible		Negligible
Groundwater	Changes to groundwater quantity	3	Moderate	No change	Moderate
	Changes to groundwater quality	3	Negligible		Negligible

Table 14-6 Summary of significance of effect (operation)

Receptor	Type of Impact	Study Section	2020 ES Unmitigated Significance of Effect	2020 ES Significance Following Mitigation	Addendum Assessment	Addendum effect
Water quality	Changes to water quality	2, 3, 5, 6	Minor impact in study section 2 (permanent) Minor benefit in study section 3 and 5 (permanent) Major benefit in study section 6 Moderate impact during drought (temporary)	Minor impact on study section 2 (permanent) Benefits to study section 3, 5, 6 unchanged. Moderate impact during drought (temporary)	No change	As 2020 significance following mitigation
	Pollution	2, 3	Minor	Negligible		
Hydro morphology	Habitat loss	2, 7	Minor benefit	-/-	As described in Section 14.9 , extension of the reservoir embankment would result in a larger embankment footprint and a longer culverted section of Riders Lane Stream below the embankment. This means that a longer section of Riders Lane Stream would be affected by controlled compensation flows from the reservoir (changes in hydrology). However, the area of channel and floodplain that will be covered by the extended embankment would have been lost below the reservoir as assessed in the 2020 ES.	As 2020 ES unmitigated significance of effect
	Habitat connectivity	7	Minor benefit	-/-		
	Changes to hydrology	3, 5	None or up to Moderate benefit	-/-		

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Receptor	Type of Impact	Study Section	2020 ES Unmitigated Significance of Effect	2020 ES Significance Following Mitigation	Addendum Assessment	Addendum effect
	Changes to river geo morphology	7	Minor benefit	-/-	Extension of the embankment will not result in any additional impacts on Riders Lane Stream.	
Flood risk	Fluvial/tidal flood risk	3, 5	Moderate benefit	-/-	No change	As 2020 ES unmitigated significance of effect
	Surface water flood risk	2	Minor	Negligible		As 2020 significance following mitigation
Groundwater	Changes to groundwater quantity	1, 2, 3	Minor	Minor	No change	As 2020 significance following mitigation
	Changes to groundwater quality	1	Minor	Negligible		As 2020 significance following mitigation

14.11 Design, Mitigation and Enhancement Measures

- 14.11.1 The measures detailed in the 2020 ES paragraphs 15.218 – 15.245 are suitable and no further mitigation measures are required. The mitigation measures are outlined in Table 3.1: REAC: Reservoir Site of the OEMP which forms part of the 2020 ES (Vol 4 Appendix 2.1; Document Reference: HTR-ATK-XX-XX-RP-Z-0069).
- 14.11.2 River restoration mitigation measures agreed with the Environment Agency as part of the Article 4.7 derogation case for Hermitage Stream (GB107042016370) water body are described in **Section 14.14**.

14.12 Assessment of Effects

- 14.12.1 As there are no changes to construction or operational impacts, or receptor importance/sensitivity, the assessment of effects has not changed since publication of the 2020 ES (paragraphs 15.246 – 15.251 and Table 15-45 and Table 15-46).

14.13 Monitoring

- 14.13.1 The monitoring measures detailed in the 2020 ES paragraphs 15.252 – 15.257 are suitable and no further mitigation measures are required.
- 14.13.2 The water mitigation measures detailed in the 2020 ES remain relevant and no further mitigation measures are required. The monitoring measures are outlined in Table 3.1: REAC: Reservoir Site of the OEMP which forms part of the 2020 ES.

14.14 Supporting Assessments

Water Framework Directive Compliance Assessment

- 14.14.1 A WFD compliance assessment was undertaken for the proposed Havant Thicket Reservoir, as part of the 2020 ES (Vol 4 Appendix 15.1; Document Reference: HTR-ATK-ZZ-ZZ-RP-Z-0123). The assessment identifies that deterioration is considered unlikely for the following water bodies screened into the assessment:
- River Lavant (Hants) GB107042016420;
 - Langstone Harbour GB580705130000;
 - East Hants Chalk GB40701G502700;
 - East Hants Lambeth Group GB40702G500800; and
 - South Hants Lambeth Group groundwater body GB40702G503700.

14.14.2 The assessment concluded that that the proposed reservoir was deemed to have the potential to cause deterioration of the impacted water body of the Riders Lane Stream which is part of the Hermitage Stream water body (GB107042016370). An Article 4.7 derogation case was prepared and accepted by the Environment Agency to enable the project to proceed through the planning process (Atkins, 2021). Three packages of river restoration measures were shortlisted through consultation with the Environment Agency. At the expert workshop (no. 3) held on 5th March 2021, the Environment Agency confirmed that Package 2 had sufficient mitigation and compensation for the Scheme, and that this package should form the basis of Section 106 funding. It was deemed that Package 2 provided sufficient length of watercourse improvement (5.5 km) and an appropriate balance of measures to satisfy ecological mitigation and compensation provides a joined up network of quality habitat improvements that will mitigate against the high conservation habitat lost from the Scheme. This package is currently being progressed for delivery with funding approved by Ofwat.

14.14.3 The proposed changes are not considered to alter the findings of the 2020 WFD compliance assessment and do not require additional mitigation as part of the ongoing Article 4.7 package of measures. This is because the additional alterations to Riders Lane Stream would occur upstream of the original embankment line, within the reservoir footprint, and have therefore already been considered.

Flood Risk Assessment

14.14.4 Based on the assumption that the extended culvert below the reservoir embankment will have the same operational design capacity as assessed in the 2020 ES Appendix 15.2: Flood Risk Assessment (FRA) (Vol 4 Appendix 15.2; Document Reference: HTR-ATK-XX-XX-RP-Z-0042). Therefore, the impacts on flood risk will be no worse than those predicted in the 2020 FRA.

14.15 Overall Assessment Findings

14.15.1 The overall findings reported in the 2020 ES Chapter 15: Water (paragraphs 15.258 – 15.262) for construction and operational phases of the Scheme have not changed, therefore the assessment remains current.

14.16 Summary

- 14.16.1 The proposed changes to the Scheme lie wholly within the planning application boundary presented in the 2020 ES. The water baseline and receptor importance remain unchanged since 2020. Extension of the reservoir embankment will not result in any additional loss of hydromorphological elements of Riders Lane Stream because the longer section of culverted watercourse would have been lost below the reservoir in the Scheme assessed in the 2020 ES. Similarly, extension of the embankment will not result in additional impacts from controlled compensation flows through the culverted section of Riders Lane Stream. The overall assessment of effects has not changed since publication of the 2020 ES.
- 14.16.2 Since 2020, a package of river restoration compensation measures has been agreed with the Environment Agency relating to Article 4.7 derogation case for Riders Lane Stream, which is part of the Hermitage Stream water body (GB107042016370). The proposed changes are not considered to alter the findings of the 2020 WFD compliance assessment and do not require additional mitigation as part of the ongoing Article 4.7 package of measures.

15 Effect on Climate

15.1 Introduction

15.1.1 This chapter provides an addendum to the 2020 ES Chapter 16: Effect on Climate assessment and should be read in conjunction with the following documents:

- 2020 ES Chapter 16: Effect on Climate (Vol 2 Chapter 16; Document Reference: HTR-ATK-ZZ-ZZ-RP-Z-0116); and
- 2020 ES Appendix 16: Carbon Model (Vol 4 Appendix 16.1; Document Reference: HTR-ATK-ZZ-ZZ-RP-0141).

15.2 Competent Expert Evidence

15.2.1 This chapter has been prepared by the following individuals who have used their knowledge and professional judgement to review the 2020 ES Effect on Climate assessment with consideration for the changes to the Scheme:

- A Senior Environmental Consultant (MEng Mechanical Engineering) with six years' experience in carrying out greenhouse gas (GHG) assessments for a range of projects, and has used their knowledge and professional judgement to complete the review.
- This chapter was reviewed by a Senior Environmental Consultant (MSc Environmental Modelling, Monitoring and Management) with 10 years' experience in carrying out greenhouse gas assessments.

15.3 Review of Legislative and Policy Framework

15.3.1 The legislation, regulation and policy presented in Table 16-1 of the 2020 ES which was relevant to the Effect of Climate assessment of the Scheme was reviewed. With consideration to the proposed changes to the Scheme, any updates and changes to legislation, regulation and policy was assessed, and where applicable are presented in **Table 15-1**.

Table 15-1: Summary of changes to policy, legislation, and guidance relevant to effects on climate

2020 ES Legislation/Policy/Guidance	Current Legislation/Policy/Guidance	Summary of Updates
National		
Not included in the 2020 ES	NPWSRI 2023	The finalised NPWSRI was published in April 2023. The NPWSRI aims to streamline the planning permission process for nationally significant water infrastructure projects and enable new water supply infrastructure including detailed requirements for climate change mitigation in relation to greenhouse gas emissions.
Not included in the 2020 ES	NPPF December 2023	The NPPF, updated in December 2023, sets out planning guidance for climate change for new developments in Section 14, which are applicable for the Havant Thicket Reservoir and the changes within this application.

2020 ES Legislation/Policy/Guidance	Current Legislation/Policy/Guidance	Summary of Updates
UK Climate Change Act 2008	UK Climate Change Act 2008	The Climate Change Act 2008 was outlined in the 2020 ES and is still applicable for ES Addendum as it provides the framework for the UK to meet its long-term goals of reducing GHG emissions.
Not included in the 2020 ES	Carbon Budget Orders (2009, 2011, 2016, 2021)	The Climate Change Act 2008 established a system of legally-binding 'Carbon Budgets' which were introduced to drive progress towards the UK's net zero targets.
Local		
Not included in the 2020 ES	Havant Borough Local Plan (Core Strategy) (2011); The Havant Borough Local Plan (Allocations) (2014)	At the time of submission of the 2020 ES, Havant Borough Council had consulted on a draft Local Plan, Draft Havant Borough Local Plan 2036 (2019), which included policy KS8 regarding Havant Thicket Reservoir. The draft Local Plan was subsequently withdrawn in April 2022. Havant Borough Council is currently developing an updated Local Plan, however at the current time (February 2024) the adopted 2011/14 plans remain current. Havant Thicket reservoir is included as Strategic Site 2 within the 2011/14 documents. A series of infrastructure requirements for Havant Thicket reservoir are noted within the draft Local Plans, which would have been material considerations when the planning application was determined and remain a material consideration for the changes within this application.
Not included in the 2020 ES	East Hampshire District Local Plan (2014); Draft East Hampshire District Council Local Plan 2021-2040 (2024),	At the time of submission of the 2020 ES, East Hampshire District Council had consulted on a draft 2014 Local Plan which included policy S31 regarding Havant Thicket reservoir. The draft Local Plan has subsequently been superseded by more recent drafts. The 2014 draft Local Plan included allocation of the Havant Thicket site for a new reservoir and would have been a material consideration when the planning application was determined and remain a material consideration for the changes within this application. Regulation 18 consultation on a new Local Plan has begun in January 2024. Notably the consultation draft does not reference Havant Thicket reservoir.
Guidance		
British Standards Institution (BSI) PAS 2080:2016 Carbon Management in Infrastructure ³²	BSI PAS 2080:2023 Carbon Management in building and infrastructure ³³	PAS2080:2023 is an update to PAS2080:2016 with the provision of a carbon management process for buildings and infrastructure to support of organisations to reduce their GHG emissions and meet climate change commitments.

15.4 Study Area

15.4.1 The study area outlined in the 2020 ES Chapter 16: Effect on Climate included direct and indirect emissions for the construction and operational phases of the Scheme, and encompassed the following elements:

- Embankments;

- Wetland retaining structure and islands;
- Control house and other structures; and
- Access roads.

15.4.2 The proposed changes to the Scheme (as detailed in **Chapter 2: Changes to the Scheme** of the ES Addendum) will result in additional material requirements and, therefore require an increase in the movement of materials within the site, and more materials that would be imported to site compared to the 2020 ES assessment.

15.4.3 The impact of the Scheme, considering the proposed changes, is evaluated through the quantification of GHG emissions for the construction phase of each element detailed above. The operational stage emissions calculated in the 2020 ES remain unchanged, as the changes to the Scheme are not anticipated to result in a change in operational emissions.

15.4.4 The Effect on Climate assessment in the 2020 ES was undertaken with reference to lifecycle stages and source categories outlined in the BSI published standard, PAS2080:2016 'Carbon Management in Infrastructure'³². The PAS2080:2016 lifecycle stage corresponding to the construction phase of the Scheme is the Before Use stage (A0-A5). PAS2080:2016 has been superseded by PAS2080:2023 'Carbon Management in Buildings and Infrastructure'³³, which was published in April 2023. However, the lifecycle stages and source categories presented in the 2020 ES based on the PAS2080:2016 are still relevant for use in the assessment, and consist of the following for the construction phase:

- Construction emissions from:
 - Raw material extraction, manufacturing, and intra-manufacturing transport (A1 – A3);
 - Transport of materials and workforce to the works site (A4); and
 - Construction processes including fuel, energy and water use, and waste transportation and treatment (A5).

³² British Standards Institution, PAS 2080:2016 Carbon management in Infrastructure, BSI Standards Limited 2016

³³ British Standards Institution, PAS 2080:2023 Carbon management in buildings and infrastructure, BSI Standards Limited 2023

15.5 Assessment Methodology

Approach to the Assessment

15.5.1 The general approach to quantifying GHG emissions as part of this chapter is largely similar to the 2020 ES Chapter 16: Effect on Climate. Any changes to the approach were because of the unavailability of the tool used in the 2020 ES, updates to emission factors used as part of the assessment, and application of the latest IEMA guide: Assessing Greenhouse Gas Emissions and Assessing their Significance³⁴ published in 2022. An overview of the methodology adopted in this assessment is presented below.

Data Collection

15.5.2 The updated material requirements for the Scheme were provided directly by Future Water, who is the Principal Contractor for the main reservoir works. The materials quantities used in the assessments are shown in **Section 15.10**.

15.5.3 The sources that have been used to inform the assessment are listed in **Table 15-2**.

Table 15-2: GHG emission assessment data sources

Data Source	Data Set	Year	Notes
Department for Energy Security and Net Zero (DESNZ) ³⁵	Conversion factors for reporting of GHG emissions	2023	Emissions factors for use in the GHG assessment for fuel consumption.
DfT WebTAG data v1.21 ³⁶	Vehicle emissions factor	2023	Representative emission factor for road vehicles.
Jones and Hammond, 2019 ³⁷	Inventory of Carbon and Energy (ICE) database	2019	Emission Factors for embodied emissions in materials used in construction.
UK Statutory Instrument	UK Carbon Budget Orders 2009 ³⁸ , 2011 ³⁹ , 2016 ⁴⁰ , 2021 ⁴¹	Various	National carbon budgets used to contextualise the emissions from the Scheme.

³⁴ Institute of Environmental Management & Assessment (IEMA) Guide: Assessing Greenhouse Gas Emissions and Evaluating their Significance (2022)

³⁵ <https://www.gov.uk/government/publications/greenhouse-gas-reporting-conversion-factors-2023>

³⁶ Department for Transport (DfT) (2023). TAG Data Book, Table A1.3.9. May 2023 v1.21

³⁷ Jones, C., Hammond, G. (2019). Circular Economy and University of Bath ICE (Inventory of Carbon & Energy) Database, Version 3.

³⁸ [The Carbon Budgets Order 2009 \(legislation.gov.uk\)](https://www.legislation.gov.uk/ukdsi/2009/01/030001_0001/1-1)

³⁹ [The Carbon Budget Order 2011 \(legislation.gov.uk\)](https://www.legislation.gov.uk/ukdsi/2011/01/030001_0001/1-1)

⁴⁰ [The Carbon Budget Order 2016 \(legislation.gov.uk\)](https://www.legislation.gov.uk/ukdsi/2016/01/030001_0001/1-1)

⁴¹ [The Carbon Budget Order 2021 \(legislation.gov.uk\)](https://www.legislation.gov.uk/ukdsi/2021/01/030001_0001/1-1)

Calculations

- 15.5.4 The GHG assessment for the 2020 ES was undertaken using the Atkins web-based tool, Carbon Knowledgebase, which calculates the emissions footprint of infrastructure projects using a central database of verified carbon factors. For the ES Addendum, the GHG emissions calculation for the construction phase of the Scheme was determined through data collected from various sources, including the Scheme's design and construction teams (e.g., tonnes of materials, kilometres driven, energy data in kilowatt hours (kWh)) and applied the relevant emission factors. The emissions factors that were used in the assessment include the ICE database, and the DESNZ GHG reporting conversion factors as detailed in **Table 15-2**.
- 15.5.5 The methodology applied to calculate emissions from each element associated with the construction phase of the Scheme is provided in the following sections.

Embodied Carbon in Materials

- 15.5.6 Embodied carbon includes GHG emissions from the extraction, transport, manufacturing, and assembly of materials required for the construction of the Scheme. Embodied carbon was calculated for imported materials required to enable the construction of the following components:
- Embankments;
 - Wetland retaining structure and islands;
 - Control house and ancillary structures; and
 - Access roads.
- 15.5.7 The construction of the Scheme will utilise site-won materials (e.g. clay and topsoil). These materials are not extracted, manufactured, assembled or transported, and therefore the use of the embodied carbon calculation is not appropriate. This is a change from the 2020 ES, which took a more conservative approach and used the embodied carbon for site-won materials. For the ES Addendum, the emissions associated with the excavation, movement and laying of site-won materials are considered in the emissions associated with the use of plant and equipment presented in paragraph **15.5.20**.
- 15.5.8 To provide a precautionary assessment, it is assumed that there will be no reduction in the GHG emissions intensity during extraction, transport and manufacturing of materials from the present day until the end of the construction phase.

- 15.5.9 The emission factors in the ICE database are 'cradle-to (factory) gate' and, therefore do not include the transportation of materials to site for imported materials. Emissions associated with the transport of imported materials to site have been quantified separately as part of the road vehicles source group.
- 15.5.10 The types of material required for the Scheme are largely similar to the 2020 ES, with the exception of the addition of steel. **Table 15-3** presents the materials emission factors used to calculate embodied carbon from imported materials in the assessment. The only change in the emission factors in this ES Addendum compared to the 2020 ES is an updated emission factor for polypropylene.

Table 15-3: Emissions Factors for Embodied Carbon

Material/Component	Carbon Factor (2020 ES)	Carbon Factor (ES Addendum)	Source (ES Addendum)
Clay*	0.024 kgCO ₂ e/kg	-	-
Topsoil*	0.024 kgCO ₂ e/kg	-	-
Sand	0.00493 kgCO ₂ e/kg	0.00493 kgCO ₂ e/kg	ICE database v3.0 ³⁷
Gravel	0.0052 kgCO ₂ e/kg	0.0052 kgCO ₂ e/kg	ICE database v3.0 ³⁷
Limestone	0.09 kgCO ₂ e/kg	0.09 kgCO ₂ e/kg	ICE database v3.0 ³⁷
Polypropylene	2 kgCO ₂ e/kg	1.63 kgCO ₂ e/kg	Plastics Europe Environmental Product Declaration (EPD) 2013 ⁴² (updated from the Plastics Europe EPD 2008 source used in the 2020 ES)
Concrete	0.103 kgCO ₂ e/kg	0.103 kgCO ₂ e/kg	ICE database v3.0 ³⁷
Asphalt	14.2 kgCO ₂ e/m ²	0.05 kgCO ₂ e/kg**	ICE database v3.0 ³⁷
Ductile Iron	2.03 kgCO ₂ e/kg	2.03 kgCO ₂ e/kg	ICE database v3.0 ³⁷
Steel	Not applicable	2.47 kgCO ₂ e/kg	ICE database v3.0 ³⁷

Note: * The clay and topsoil carbon factors are not applicable in the ES Addendum as the embodied carbon in materials is not quantified for the site-won materials.

** This factor uses a different metric than the 2020 ES factor as the latest asphalt material quantity for the ES Addendum was provided in mass.

- 15.5.11 It has been assumed that some virgin materials will be used for some components of the Scheme and this information was provided by Future Water.

⁴² [Eco-profiles set • Plastics Europe](#)

Road Vehicles

- 15.5.12 Road vehicle movements associated with the construction of the Scheme would result in the release of GHG emissions. GHG emissions are calculated from the total distance (km) travelled by HGVs and cars (light vehicles) to and from the construction site. It should be noted that approach is line the 2020 ES for the GHG emissions from HGVs only as the emissions from cars were not considered in the 2020 ES.
- 15.5.13 The total HGV and car movements are provided in **Chapter 12: Traffic and Transport** of the ES Addendum, where it is anticipated that a daily maximum of 100 HGVs and 125 cars arrive and depart from the reservoir construction site, which and is unchanged from the 2020 ES. Data for the total anticipated vehicle movements or an annual average during the construction phase were not available for the assessment. Therefore, the GHG emissions associated with the HGVs were calculated based on the HGV movements derived based on the total mass of each type of material transported to site. In addition, the GHG emissions associated with cars were calculated based on the maximum daily vehicle movements assumed to take place over the entire construction period, which is a conservative approach and will result in an overestimation.
- 15.5.14 The 2020 ES calculated GHG emissions associated with HGVs used to import materials and for waste removal only. GHG emissions from HGV movements were calculated using emission factors in units of kgCO₂e per tonne.km. Therefore, the required mass of each material was multiplied by the anticipated distance travelled, with an assumed distance of 50 km per movement, which was the same approach as the 2020 ES. Emission factors were obtained from the DESNZ database, where it was assumed that diesel HGVs would be used, which would be 50% laden (assuming that vehicles make two journeys, one with a full and empty load respectively), which is again in accordance with the 2020 ES. The updated HGV carbon factors obtained from the 2023 DESNZ database used in this assessment are shown in **Table 15-4**.

Table 15-4: HGVs emission factors

Activity	HGV Emission Factor	Source/Note
Transport of materials	0.0931 kgCO ₂ e per tonne.km	DESNZ greenhouse gas reporting conversion factors ³⁵ . HGV (diesel), All Articulated, 50% laden
Transport of waste	0.1157 kgCO ₂ e per tonne.km	DESNZ greenhouse gas reporting conversion factors ³⁵ . HGV (diesel), rigid (>3.5 - 7.5 tonnes) 50% laden

- 15.5.15 The distances travelled by cars was calculated by multiplying the anticipated number of movements (125 cars per day over the construction period) by an assumed one-way trip distance of 10 km and therefore a round trip distance of 20 km, which in the absence of project specific data, is an assumption adopted from other infrastructure projects.

- 15.5.16 The construction period 2024 to 2031 with six working days per week has been assumed for the car's emissions calculation.
- 15.5.17 To provide a conservative assessment, the fleet make up of cars in the UK (in terms of fuel and Euro standards) for the earliest year of construction (2024) has been used in the assessment.
- 15.5.18 The fleet composition for 2024 (i.e., proportion of diesel, petrol, and electric cars) has been obtained from the DfT WebTAG data v1.21³⁶. The fleet composition used in the assessment, and emission factors associated with each vehicle type are provided in **Table 15-5**. The emission factors for each vehicle type were obtained from DESNZ database³⁵.

Table 15-5: Calculation of emission factors used for cars in the assessment

Earliest Year of Construction	Fleet Composition ³⁶			Vehicle Emission Factor (kg CO ₂ e per km) ³⁵			Emission Factor use in the Assessment (kg CO ₂ e per km)
	Diesel	Petrol	Electric	Diesel	Petrol	Electric*	
2024	50.7%	38.5%	10.8%	0.17	0.164	0.066	0.156

*Assumed to be plug-in hybrid electric vehicle, as battery electric vehicle has 0 CO₂e emissions in the 2023 DESNZ dataset

Water Consumption

- 15.5.19 Water consumption is required during the construction of the main embankment, which is anticipated to be 110 m³ per month (not including water for dust suppression which is extracted from lagoons) from 2024 to 2031 (96 months). GHG emissions associated with water consumption have been derived by multiplying the total anticipated water requirements with a representative emission factor (0.177 kgCO₂e per m³) which was obtained from the DESNZ database³⁵.

Plant and Equipment

- 15.5.20 The GHG emissions associated with the use of Non-Road Mobile Machinery (NRMM) during the construction of the Scheme were calculated using the data provided in **Table 15-6** and emission factors obtained from the European Monitoring and Evaluation Programme (EMEP)/European Environment Agency (EEA) air pollutant emission inventory guidebook⁴³. This includes emissions associated with the excavation, movement and laying of site-won materials. The plant and equipment of the Scheme components in the scope of the ES Addendum are highlighted in **Table 15-6**.

Table 15-6 Construction Plant and Equipment

Scheme Component	Plant and Equipment	Rated Power	Operational Hours
Embankment	49 T Excavator	300kW / 405hp	18,720
	ADT	250kW / 337.5hp	102,960
	D65	150kW / 202.5hp	82,240

⁴³ [EMEP/EEA air pollutant emission inventory guidebook 2023 — European Environment Agency \(europa.eu\)](https://www.eea.europa.eu/en/air-pollution/emissions/emission-factors/emission-factors)

Scheme Component	Plant and Equipment	Rated Power	Operational Hours
	Smooth Roller	50kW / 67.5hp	51,480
	Padfoot	60kW / 81hp	51,480
	37 Tonne Excavator	200kW / 270hp	28,080
	Wirtgen Soil Stabilising Machine	200kW / 270hp	4,320
Culvert and Valve Shaft	30 Tonne Excavator	200kW / 270hp	10,951
	80 Tonne Excavator	400kW / 540hp	10,951
	120 Tonne Crawler Crane	250kW / 337.5hp	10,951
Spillway Construction	30 Tonne Excavator	200kW / 270hp	90
	80 Tonne Excavator	400kW / 540hp	90
	120 Tonne Crawler Crane	250kW / 337.5hp	90
Wetland	49 T Excavator	300kW / 405hp	682
	ADT	250kW / 337.5hp	3,750
	D65	150kW / 202.5hp	3,068
	Smooth Roller	50kW / 67.5hp	1,875
	Padfoot	60kW / 81hp	1,875
	37 Tonne Excavator	200kW / 270hp	1,023
	Wirtgen Soil Stabilising Machine	200kW / 270hp	157
Control House	30 Tonne Excavator	200kW / 270hp	1,481
	80 Tonne Excavator	400kW / 540hp	1,481
	120 Tonne Excavator	250kW / 337.5hp	1,481

Electricity Consumption

- 15.5.21 The GHG emissions associated with electricity consumption for the construction of the Scheme is assumed to be around 1,311,693 kWh and applying an electricity generation factor.

Comparison to the UK Carbon Budgets

- 15.5.22 The comparison to the UK Carbon Budgets assessed in the 2020 ES are described in paragraphs 16.14 and 16.15 of the 2020 ES Chapter 16: Effect on Climate.
- 15.5.23 The comparison to the UK Carbon Budgets in the ES Addendum to determine if the construction emissions from the Scheme would adversely affect the UK's ability to meet its future carbon targets is presented in Significance Assessment 0.

Significance Assessment

- 15.5.24 The methodology for assessing the significance of the Scheme's GHG emissions presented in the 2020 ES has changed in line with the IEMA guidance³⁴. The IEMA guidance recognises *"when evaluating significance, all new GHG emissions contribute to a negative environmental impact; however, some projects will replace existing development or baseline activity that has a higher GHG profile. The significance of a project's emissions should therefore be based on its net impact over its lifetime, which may be positive, negative or negligible"*.
- 15.5.25 Significance can be evaluated in a number of ways depending on the context of the assessment (i.e., sector-based, locally, nationally, policy goals or against performance standards). The IEMA guidance recommends that significance criteria align with the Paris Agreement, the UK's Carbon Budgets up to 2037 and net zero commitments: *"the crux of significance is not whether a project emits GHG emissions, nor even the magnitude of GHG emissions alone, but whether it contributes to reducing GHG emissions relative to a comparable baseline consistent with a trajectory towards net zero by 2050"*.
- 15.5.26 The IEMA guidance provides relative significance descriptions to assist assessments, specifically in the EIA context. Section VI of the IEMA guidance describes five distinct levels of significance which are not solely based on whether the project emits GHG emissions alone, but how the project makes a relative contribution towards achieving a science-based 1.5°C aligned transition towards net zero. These are presented in **Table 15-7**.

Table 15-7: Assessment Significance Criteria based on the principles of the 2022 IEMA Guidance

Significance	Definition
Major adverse	The Scheme's GHG impacts are not mitigated or are only compliant with do-minimum standards set through regulation, and do not provide further reductions required by existing local and national policy for projects of this type. A project with major adverse effects is locking in emissions and does not make a meaningful contribution to the UK's trajectory towards net zero.
Moderate adverse	The Scheme's GHG impacts are partially mitigated and may partially meet the applicable existing and emerging policy requirements but would not fully contribute to decarbonisation in line with local and national policy goals for projects of this type. A project with moderate adverse effects falls short of fully contributing to the UK's trajectory towards net zero.
Minor adverse	The Scheme's GHG impacts would be fully consistent with applicable existing and emerging policy requirements and good practice design standards for projects of this type. A project with minor adverse effects is fully in line with measures necessary to achieve the UK's trajectory towards net zero.
Negligible	The Scheme's GHG impacts would be reduced through measures that go well beyond existing and emerging policy and design standards for projects of this type, such that radical decarbonisation or net zero is achieved well before 2050. A project with negligible effects provides GHG performance that is well 'ahead of the curve' for the trajectory towards net zero and has minimal residual emissions.
Beneficial	The Scheme's net GHG impacts are below zero and it causes a reduction in atmospheric GHG concentration, whether directly or indirectly, compared to the without-project baseline. A project with beneficial effects substantially exceeds net zero requirements with a positive climate impact.

- 15.5.27 The effect significance of the Scheme's GHG emissions was evaluated by the Scheme's phase. For the construction phase, significance was determined by comparing the magnitude of emissions with the fourth and fifth budget periods (2023 -2027 and 2028-2032 respectively) and evaluating its effect on the UK's ability to meet its future carbon budgets and, by proxy, the emission reduction needed to achieve its international climate commitments and a science-based 1.5°C transition towards net zero.
- 15.5.28 For the Scheme's operational phase, which is anticipated to commence after the completion of the main reservoir embankment and the wet commissioning of the reservoir in 2031, the relevant UK carbon budgets have not been set or do not fully apply, as the Scheme's operational lifetime extends beyond 2050 by which the UK commits to achieving net zero. Therefore, the effect significance for these phases was determined by considering the Scheme's effects on the UK's ability to achieve and maintain its net zero status. The Scheme's anticipated first operational year is 2032 which aligns with the fifth carbon budget (2028-2032) and the subsequent five operational years align with the sixth carbon budget (2033 to 2037). Emissions over this budget period have also been compared for further context.
- 15.5.29 Likely significant effects identified within the assessment as major/moderate adverse or beneficial are deemed to be significant in EIA terms within this chapter. In cases where there is a net reduction in emissions, only one level of significance criteria is offered.

15.6 Assumptions and Limitations

- 15.6.1 For the 2020 ES, a principal contractor was not available, therefore the 2020 assessment was performed using data available from an outline design. For the ES Addendum, the GHG assessment has been based on the information provided by Future Water (Principal Contractor), who are developing the detailed design and undertaking the construction of the main reservoir works for the Scheme. Therefore, more accurate data was available for the ES Addendum assessment than was available for the 2020 ES.
- 15.6.2 To calculate the emissions associated with the site-won materials (i.e., clay, topsoil), the assessment used the relevant conversion factors related to the extraction of the materials (see **Table 15-3**). As these conversion factors take into consideration the fuel and energy required to extract and transport the material ('cradle' to gate principle) the fuel consumption is not required to be reported in this ES Addendum.
- 15.6.3 The 2020 ES did not assess the emissions associated with land use change on the basis that any effects are likely to be negligible in comparison with the overall emissions. This ES Addendum takes the same approach as the 2020 ES on land use emissions.

15.7 Update to Baseline Environmental Conditions

- 15.7.1 As stated in the 2020 ES Chapter 16: Effect on Climate, the atmosphere is the only applicable receptor for the GHG assessment. As such, it is affected by all global sources of GHGs, and is therefore considered to be a high sensitivity to additional emissions.
- 15.7.2 National and regional GHG emissions, and Portsmouth Water's recent GHG emissions are presented in the following sections. The regional and Portsmouth Water baseline emissions have been provided for context. The national and regional baseline information presented in the 2020 ES has been updated to the latest available figures available at the time of writing the ES Addendum.

National Baseline Emissions

- 15.7.3 The most recent available annual GHG emissions figures for the UK are for the year 2022, where net territorial GHG emissions were estimated to be 406.2 million tonnes CO₂e⁴⁴. This represents a 3.5% reduction compared to emissions in the year 2021. There was a decrease in GHG emissions across most sectors from 2021 to 2022. The largest contributing factor was a reduction in heating use due to warmer weather. The largest contributing sectors within the UK by emissions contribution are 'Domestic transport' and 'Building and product uses'.
- 15.7.4 The position of the water sector within the sectors outlined in the Department for Business and Industrial Strategy national emissions report⁴⁴ is not entirely clear. However, Water UK reports emissions from the sector each financial year (1st April – 31st March)⁴⁵. The latest available figures highlight that emissions from the sector were approximately 2.5 or 1.6 Metric tonnes CO₂e in the 2020 – 2021 financial year, depending on the calculation methodology⁴⁵. These emissions fall within the organisational boundary adopted by the sector to calculate GHG emissions, which covers "*operational emissions*" and "*any other additional emissions data being gathered at the discretion of the water company*"⁴⁶.
- 15.7.5 Over the operational lifespan of the Scheme, national UK emissions are anticipated to decrease due to the anticipated decarbonisation of many sectors in the UK. A prescribed pathway for the reduction of emissions to 2050 and beyond is not available, however Carbon Budgets have been published up until 2037⁴¹.
- 15.7.6 The Carbon Budgets set a cap on the total amount of GHGs the UK can emit over a five-year period. The sixth Carbon Budget, enshrined in UK law by the Carbon Budget Order 2021, was published by the Committee on Climate Change in December 2020, which is the latest available Carbon Budget for the UK.

Regional Baseline Emissions

15.7.7 The 2020 ES outlined the regional emissions for the Havant Borough and East Hampshire in 2017 (437.5 kilotonnes (kt)CO₂e), which was the latest available information at the time, obtained from the DESNZ UK local authority and regional greenhouse gas emissions national statistics⁴⁷. The latest available regional emissions (for the 2021 reporting year) show that emissions in the Havant Borough were a total of 376 ktCO₂e, which is a 43% reduction compared to 2005, the earliest year of reporting (665 ktCO₂e) for the Borough. In addition, the total emissions for East Hampshire is 520 ktCO₂ which is a 37% reduction when compared to 2005 (826 ktCO₂e).

Portsmouth Water Baseline Emissions

15.7.8 Portsmouth Water reports its emissions in line with the GHG protocol⁴⁸ which categories emissions into the following scopes:

- Scope 1 – “are direct emissions that are produced from our sites and assets, such as process emissions, our vehicle fleet and fuels used on site”. For a water company these can include refrigerants and fuels including gas oil, diesel, and natural gas.
- Scope 2 – “emissions are indirect energy emission from the generation of electricity provided by energy suppliers”. For a water company these can include emissions from imported electricity.
- Scope 3 – “are other indirect emissions such as the transport and energy emissions from our operational contractors and the emissions associated with the efficiency of electricity distribution”. For a water company these can include transmission and distribution losses from grid imports, well-to-tank emissions of fuels, outsourced activities, chemical use, business travel.

15.7.9 In 2019, the UK water industry, including Portsmouth Water, made a Public Interest Commitment (PIC)⁴⁹ to net zero operational emissions by 2030 with measures such as greater water efficiency, buying green energy as well as generating renewable energy. To support the water industry’s PIC, emissions reports based on water companies’ operational emissions are issued on an annual basis⁴⁶. Appendix 7E - Carbon of the Revised Draft Portsmouth WRMP (2023) for the next 50 years (2025-2075) states that Portsmouth Water is developing its Net Zero Route map which aims to set out how it will meet the net zero targets⁵⁰.

⁴⁴2022 UK Greenhouse Gas emissions: one page summary (publishing.service.gov.uk)

⁴⁵Water UK Annual Emissions Report 2021 | Water UK

⁴⁶Water-UK-Net-Zero-2030-Routemap.pdf

⁴⁷UK local authority and regional greenhouse gas emissions national statistics, 2005 to 2021 - GOV.UK (www.gov.uk)

⁴⁸ghg-protocol-revised.pdf (ghgprotocol.org)

⁴⁹Public-Interest-Commitment.pdf (water.org.uk)

⁵⁰Title Page (portsmouthwater.co.uk)

15.7.10 Portsmouth Water's latest net operational emissions considering the scope 1, 2 and 3 emissions, in the 2022 - 2023 financial year were approximately 6,700 tonnes CO₂e as detailed in their Annual Performance Report 2023⁵¹.

Do-Minimum Scenario

15.7.11 The project baseline definition as the Do-Minimum scenario stated in paragraph 16.30 of the 2020 ES remains unchanged for the ES Addendum. In the 2020 ES, it was assumed that there are no emissions from the current site, and that the baseline is therefore 0 tonnes CO₂ emitted per year.

15.8 Potential Impacts

15.8.1 The 2020 ES highlighted the Scheme's potential impact to climate change due GHG emissions released into the atmosphere. The ES Addendum maintains that the Scheme has the potential to impact climate change and the significance of the potential impacts are evaluated in **Section 15.10**.

15.9 Design, Mitigation and Enhancement Measures

15.9.1 The design principles detailed in paragraphs 16.33, and 16.39 to 16.47 of the 2020 ES Chapter 16: Effect on Climate remain relevant.

15.9.2 The key design enhancements measures outlined in the 2020 ES include the following:

- The materials to be used in the embankments will be sourced from the site as far as possible, and where this is not possible, local materials will be used;
- Off-site disposal of materials found on site will be avoided as much as possible; and
- Materials selected will be sustainable and suitable for the rural context of the reservoir in a country park. Importing of materials not found on site will be minimised as much as possible; where required the aim will be to utilise local sources where appropriate.

15.10 Assessment of Effects

Construction – Embodied Carbon in Materials

Embankments

15.10.1 GHG emissions associated with the production of materials for the construction of the embankments based on the changes to the Scheme are shown in **Table 15-8**.

⁵¹ [*PW Annual-Performance 2023 FINAL.pdf \(portsmouthwater.co.uk\)*](#)

Table 15-8: Production of embankment materials

Material	2020 ES Quantity (tonnes)	2020 ES CO ₂ e (tonnes)	ES Addendum Quantity (tonnes)	ES Addendum CO ₂ e (tonnes)	CO ₂ e % change in ES Addendum compared to 2020 ES
Clay (site won)	4,466,678	107,202	5,975,255	See Table 15-15	-
Topsoil (site won)	74,752	1,794	219,771	See Table 15-15	-
Sand	183,058	902	251,824	1,241	38%
Gravel	168,937	878	202,724	1,054	20%
Limestone	87,128	7,841	87,128	7,842	0%
Polypropylene	416	832	438	714	-14%
Total		119,449		10,815	-91%

15.10.2 As per the 2020 ES, most of the embankment materials, specifically clay and topsoil, will be sourced onsite and will not have associated transport emissions. In line with the methodology outlined in paragraph 15.5.6, for the ES Addendum, the emissions associated with imported materials to the site will be quantified using embodied carbon factors except for the site-won materials. The emissions associated with the site-won materials are quantified based on the plant and equipment use are presented in Table 15-15. This is a change from the 2020 ES, where embodied carbon in the site-won materials was conservatively quantified using embodied emission factors. As presented in Table 15-8, the emissions associated with the embankment materials based on the proposed changes to the Scheme is 10,815 tonnes CO₂e. This is a 91% decrease compared to the emissions reported in the 2020 ES (119,449 tonnes CO₂e). This is due to the revision of the material quantities provided in the 2020 ES and the change in methodology for quantifying the site-won materials emissions.

Wetland Retaining Structure and Islands

15.10.3 The updated emissions associated with the production of materials for the construction of the wetland retaining structures and islands are presented in Table 15-9. The emissions presented in Table 16-4 of the 2020 ES are also detailed in Table 15-9.

Table 15-9: Production of wetland materials

Material	2020 ES Quantity (tonnes)	2020 ES CO ₂ e (tonnes)	ES Addendum Quantity (tonnes)	ES Addendum CO ₂ e (tonnes)	CO ₂ e % change in ES Addendum compared to 2020 ES
Clay (site won)	131,670	3,160	331,808	See Table 15-15	-
Topsoil (site won)	12,266	294	30,910	See Table 15-15	-
Limestone	4,264	384	4,264	384	0%
Polypropylene	22	45	22	36	-20%
Total		3,883		420	-89%

15.10.4 As per the 2020 ES, clay and topsoil will be sourced onsite and do not have associated transport emissions. The approach to the site-won materials stated in paragraph **15.10.1** applies to the wetland embodied carbon in materials calculation. The emissions associated with the site-won materials will be quantified based on the plant and equipment use presented in the **Section Construction – Plant and Equipment**. The updated emissions associated with the transportation of wetland structure materials is 420 tonnes CO₂e, which is an 89% decrease compared to the 2020 ES due to the revision of the material quantities provided at the 2020 ES stage and the change in methodology for quantifying the site-won materials emissions.

Control House and Structures

15.10.5 The updated emissions associated with the production of materials for the construction of the control house and structures are presented in **Table 15-10**. The emissions have been obtained based on the approach detailed in paragraph **15.5.6**. The emissions presented in Table 16-5 of the 2020 ES Chapter 16: Effect on Climate are also detailed in **Table 15-10**.

Table 15-10: Production of control house materials

Component	Material	2020 ES Quantity (tonnes)	2020 ES CO ₂ e (tonnes)	ES Addendum Quantity (tonnes)	ES Addendum CO ₂ e (tonnes)	CO ₂ e % change in ES Addendum compared to 2020 ES
Culvert under embankment (for 1:7 slope)	Concrete	18,878	1,944	9,025	930	-52%
Valve access shaft	Concrete	600	62	2,180	225	262%
Control House (option 3)	Concrete	1,318	136	7,280	750	451%
Spillway	Concrete	126	13	327	808	159%
Pipes	Ductile Iron	117	238	450	914	284%
Various*	Steel	-	-	2,446	6,045	-
Total			2,393		8,896	272%

15.10.6 The updated emissions associated with the construction of control house materials is 8,896 tonnes CO₂e. This is an increase of 272% compared to the 2020 ES emissions (2,392 tonnes CO₂e). The increase is due to more detailed data provided by the design and construction teams than the material quantities provided at the 2020 ES stage. A significant proportion of the increase in embodied carbon emissions is due to the quantities of steel which were not included in the control house materials quantities in the 2020 ES. The steel quantities provided for the ES Addendum resulted in embodied carbon emissions of 6,045 tonnes CO₂e which represents a 68% of the total embodied carbon emissions (8, 896 tonnes CO₂e) for the control house.

Access Roads

15.10.7 The updated emissions associated with the production of materials for the construction of the access roads are presented in **Table 15-11**. The emissions presented in Table 16-6 of the 2020 ES Chapter 16: Effect on Climate are also detailed in **Table 15-11**.

Table 15-11: Production of access road materials

Component	Material	2020 ES Quantity (tonnes)	2020 ES CO ₂ e (tonnes)	ES Addendum Quantity (tonnes)	ES Addendum CO ₂ e (tonnes)	CO ₂ e % change in ES Addendum compared to 2020 ES
North Access	Aggregate	7,289	38	10,503	55	44%
	Asphalt	1,157	60	1,668	84	39%
South Access	Aggregate	4,817	25	4,817	25	0%
	Asphalt	2,624	88	2,624	131	49%
Car park	Aggregate	3,874	20	3,874	20	1%
	Asphalt	1,210	40	1,210	61	52%
Total			271		375	39%

15.10.8 The updated emissions associated with the construction of the access roads is 375 tonnes CO₂e, which is an increase of 39% compared to the 2020 ES due to the provision of more accurate data provided by Future Water at the time of writing the ES Addendum.

Visitor Centre and Educational Centre

15.10.9 The 2020 ES presented the construction emissions for the visitor centre and educational centre as 1,650 tonnes CO₂e. However, this ES Addendum does not cover these elements of the wider Scheme and is the responsibility of Portsmouth Water. Therefore, the visitor centre and educational centre construction emissions is not considered in this ES Addendum.

Construction – Road Vehicle Emissions

15.10.10 **Table 15-12** presents the emissions associated with the transportation of materials to the construction site based on the proposed changes to the Scheme. The figures for road vehicle emissions presented in paragraphs 16.50, 16.54, 16.58 and 16.61 in the 2020 ES are also included in **Table 15-12**.

Table 15-12: Construction emissions from material transport by HGVs

Component	2020 ES Transported Material (tonnes)	2020 ES CO ₂ e (tonnes)	ES Addendum Transported Material (tonnes)	2020 ES CO ₂ e (tonnes)	CO ₂ e % change in ES Addendum compared to 2020 ES
Embankment	4,796,521	46,413	542,093	5,049	-89%
Wetland retaining structure and islands	4,286	42	4,286	40	-4%
Control house and structures	21,039	205	21,708	202	-1%
North Access	8,446	82	12,171	113	38%
South Access	7,441	72	7,441	69	-4%
Car park	5,084	49	5,084	47	-4%
Total		46,863		5,521	-88%

15.10.11 **Table 15-12** shows that the total emissions from road vehicles for the transportation of imported materials to site is anticipated as 5,521 tonnes CO₂e, which a decrease of 88% compared to the 2020 ES value of 46,863 tonnes CO₂e. The transportation of embankment materials contributes a significant proportion of the reduction in emissions, with an 89% reduction in emissions compared to the 2020 ES. It should be noted that the 2020 ES calculated the emissions based on the transportation of 4,796,521 tonnes of materials, which does not align with the total mass of imported materials non-site won materials (439,539 tonnes), which includes, sand, gravel, limestone, and polypropylene as shown in **Table 15-8**. The emissions associated with the transport of north access road materials also contribute a significant proportion of the reduction in emissions, with a 38% reduction in emission compared to the 2020 ES.

15.10.12 The total distance travelled by cars during the construction period of 2024-2031 was derived to be 6,257,143 km in line with the methodology detailed in Calculations . Using the emission factor of 0.156 kg CO₂e per km presented in **Table 15-5** the emissions associated with car use by employees during construction is 974 tonnes CO₂e.

Waste Transportation

15.10.13 During the construction of the Scheme, waste generated which requires transportation offsite was only relevant to the access roads based on the information presented in the 2020 ES Appendix 16.1: Carbon Model and is assumed to remain unchanged for the ES Addendum. For the ES Addendum, the emissions from the transportation of waste were calculated using the same waste quantities but with the latest emission factor for HGV's (detailed in **Table 15-4**), and are presented in **Table 15-13**.

Table 15-13: Construction waste transportation emissions

Component	2020 ES Waste Quantity (tonnes)	2020 ES tonnes CO ₂ e	ES Addendum Waste Quantity (tonnes)	ES Addendum tonnes CO ₂ e
North Access - Aggregate	2,401	23	Unchanged from the 2020 ES	28
South Access - Aggregate	4,280	42	Unchanged from the 2020 ES	50
Car park - Aggregate	5,299.6	52	Unchanged from the 2020 ES	61
Total	11,981	117	Unchanged from the 2020 ES	139

Construction – Water Use

15.10.14 Water use for the Scheme was not quantified in the 2020 ES due to unavailable information. For the ES Addendum, the water usage information was available as detailed in the **Water Consumption** section of the Calculations **Section**. Based on the methodology detailed in this section, the water use during the construction phase is quantified to be 19 tonnes CO₂e.

Construction – Plant and Equipment

15.10.15 Due to unavailable data, the plant and equipment construction emissions were not quantified in the 2020 ES. However, for the ES Addendum, sufficient information to calculate the associated emissions was provided by the Scheme's design and construction teams. The total GHG emissions associated with the plant and equipment anticipated to support the construction of the Scheme (detailed in **Table 15-6**) is 56,650 tonnes CO₂e as presented in **Table 15-14**.

Table 15-14 Construction Plant and Equipment emissions

Scheme Component	GHG Emissions (tonnes CO ₂ e)
Embankment	44,289
Culvert and Valve Shaft	7,354
Spillway	60
Wetland	1,622
Control House	994
Landscaping (Hard and Soft)	215
Roads	2,116
Total	56,650

15.10.16 Based on the quantities of the site-won materials, the emissions related to the construction of the embankment and wetland are based on the plant and equipment used to excavate and place the materials within the Scheme footprint. **Table 15-15** presents the quantities of the site-won materials required for embankment and wetland, and their associated carbon emissions.

Table 15-15 Site-won materials carbon emissions due to plant use

Scheme Component	GHG Emissions (tonnes CO ₂ e)
Embankment	
Clay (site-won)	43,563
Topsoil (site-won)	726
Embankment total	44,3289
Wetland	
Clay (site-won)	1,484
Topsoil (site-won)	138
Wetland total	1,622

Construction – Electricity Consumption

15.10.17 The GHG emissions associated with the Scheme electricity consumption, which is detailed in paragraph **15.5.21**, during the construction phase was provided by the Scheme's design and construction teams as 81 tonnes CO₂e.

Total Construction Phase Emissions

15.10.18 The total emissions for the construction phase based on the proposed changes to the Scheme are shown in **Table 15-16**. Emissions from the 2020 ES are also provided.

Table 15-16: Construction phase GHG emissions

Emissions Source		2020 ES GHG Emissions tonnes CO ₂ e	ES Addendum GHG Emissions tonnes CO ₂ e	% Change
	Design Element			
Embodied carbon in material and HGVs emissions (material transport)	Embankment	165,861	15,864	-90%
	Wetland retaining structure and islands	3,925	460	-88%
	Control house and structures	2,598	9,098	251%
	Access roads (north access, south access, and car park)	475	605	27%
Visitor centre and education centre		1,500	-	-
Employee transportation (cars)		-	974	-
Water use		-	19	-
Waste transportation		117	139	19%
Plant and Equipment		-	56,650	-
Electricity Consumption		-	81	-
Total		172,987	83,890	-52%

15.10.19 As the site-won materials are excavated, transported, and layered within the construction site, the embodied carbon calculation used in the 2020 ES was inappropriate. The site-won materials (e.g., topsoil and clay) which were considered in the embodied carbon calculation in the 2020 ES are no longer considered in this ES Addendum.

15.10.20 The only associated emissions for the site-won materials are plant and equipment use, which is quantified in this ES Addendum. Therefore, the total construction emissions for the Scheme have decreased by 52%, predominately due to the reductions of 90% and 88% in the embodied emissions associated with the construction of the embankment and wetland respectively. This is a result of a change in the methodology for deriving embodied carbon in materials.

Operation

15.10.21 The assessment of the emissions associated with the operation of the Scheme presented in the 2020 ES remains unchanged. As detailed in paragraph 16.66 of the 2020 ES, the operational carbon emissions for the reservoir schemes were estimated as 42,984 tCO₂e which is 716 tCO₂e per year over a 60-year design life.

Significance Assessment

15.10.22 The contribution of the construction and operation of the Scheme, with the proposed changes, to the UK's overall budgets are presented in **Table 15-17**. The 2020 ES operational data was used to inform the contribution to the 5th and 6th carbon budget period. It should be noted that Table 16-9 in the 2020 ES presents the Scheme's emission contribution to the UK carbon budget based on the available carbon budgets and the construction and operational phases at the time it was written.

Table 15-17: Contribution of the construction and operation of the Scheme to the UK's carbon budgets

Budgetary Period	National Carbon Budget	Scheme Stage	ES Addendum Reservoir Emissions (% of budget)
2023-2027 (4 th budget period)	1,950 MtCO ₂ e	Construction (2024-2027)	0.07 MtCO ₂ e (0.003%)
2028-2032 (5 th budget period)	1,725 MtCO ₂ e	Construction (2028 - 2031)	0.02 MtCO ₂ e (0.001%)
2028-2032 (5 th budget period)	1,725 MtCO ₂ e	Operation (2032)	0.00716 MtCO ₂ e (0.00004%)
2033-2037 (6 th budget period)	965 MtCO ₂ e	Operation	0.00358 MtCO ₂ e (0.0004%)

15.10.23 Construction activities for the components considered in this ES Addendum will take place between 2024 and 2031, which falls in the fourth and fifth budget periods (2023 -2027 and 2028-2032 respectively). This is a change to the assessment in the 2020 ES which considered construction activities to take place between 2021 and 2029, and therefore to fall across the third, fourth and fifth carbon budget periods. Based on the assumption that the total construction emissions of 83,890 tonnes CO₂e is spread evenly across the construction period, giving an annual construction emission of approximately 16,778 tonnes CO₂e, the construction of the Scheme would contribute 0.003% and 0.001% to the fourth and fifth carbon budget periods respectively, which forms a relatively small proportion of the respective carbon budgets. In addition, construction GHG emissions would occur over a short duration as a single occurrence. Therefore, the construction of the Scheme would result in GHG emissions which would contribute to global climate change.

15.10.24 The operational phase of the Scheme is anticipated to commence in 2032 after the wet commissioning of the Scheme concludes in 2031. Based on the operation of the Scheme in 2032, the annual emissions are 716 tonnes CO₂e, which contributes 0.00004% to the fifth carbon budget period. The Scheme's operational emission over the subsequent five years (2033 – 2037), results in approximately 3,580 tonnes CO₂e, which contributes 0.0004% of the sixth carbon period.

15.10.25 Consequently, the construction and operational GHG emissions are unlikely to have a significant effect on global climate change and are unlikely to adversely affect the UK's ability to meet its future carbon reduction targets.

15.10.26 Therefore, the Scheme's construction and operational GHG emissions are considered to have minor adverse effect which is considered to be not significant in EIA terms.

15.11 Monitoring

15.11.1 The monitoring requirements outlined in the 2020 ES have not changed.

15.12 Summary

15.12.1 The GHG emissions for the construction of the Scheme, with consideration of the design changes and the additional assessment of emission sources not considered in the 2020 ES, resulted in a 53% decrease in construction emissions. The reduction in construction emissions is due to the conservative approach taken in the 2020 ES which applied embodied carbon factors to site-won materials. This further supports the assessment that the Scheme is anticipated to make a small contribution to the overall national emissions. Therefore, the conclusion of the 2020 ES that the Scheme is deemed unlikely to cause a significant effect on climate change remains unchanged.

16 Vulnerability to Climate Change

16.1 Introduction

16.1.1 This chapter provides an addendum to the Vulnerability to Climate Change assessment included within the 2020 ES and should be read in conjunction with the following document:

- 2020 ES Chapter 17: Vulnerability to Climate Change (Vol 2 Chapter 17; Document Reference: HTR-ATK-ZZ-ZZ-RP-Z-0117).

16.2 Competent Expert Evidence

16.2.1 This chapter has been prepared by the following individuals who have used their knowledge and professional judgement to review the 2020 ES Vulnerability to Climate Change assessment with consideration for the proposed changes to the Scheme:

- A Senior Environmental Consultant (MEng Mechanical Engineering) with six years' experience in environmental impact assessment and have used their knowledge and professional judgement to complete the review.
- This chapter was reviewed by a Senior Environmental Consultant (MSc Environmental Modelling, Monitoring and Management) with 10 years' experience in carrying out environmental impact assessment.

16.3 Review of Legislative and Policy Framework

16.3.1 The legislation, regulation and policy presented in Table 17-1 of the 2020 ES relevant to the Vulnerability to Climate Change assessment of the Scheme with consideration to the proposed changes were assessed and where applicable the identified updates are presented in **Table 16-1**.

Table 16-1: Review of legislative and policy framework relevant to vulnerability to climate change

2020 ES Legislation/Policy/Guidance	Current Legislation/Policy/Guidance	Summary of Updates
National		
NPPF 2019	NPPF, December 2023	The NPPF, updated in December 2023, sets out planning guidance for climate change for new developments in Section 14, which are applicable for the Havant Thicket Reservoir and the changes within this application.
Draft NPSWRI, 2018	NPSWRI 2023	The final version of the draft NPWSRI issued to consultation in November 2018 was published in April 2023. The NPWSRI aims to streamline the planning permission process for nationally significant water infrastructure projects and enable new water supply infrastructure.
Local		
East Hampshire District Council, Draft Local Plan, 2017-36	East Hampshire District Local Plan (2014);	The 2014 draft Local Plan included allocation of the Havant Thicket site for a new reservoir and would have been a material consideration when the planning application was

2020 ES Legislation/Policy/Guidance	Current Legislation/Policy/Guidance	Summary of Updates
	East Hampshire District Council, Draft Local Plan 2021-2040	determined and remain a material consideration for the changes within this application. The consultation Draft Local Plan 2021-2040 which was issued on 22nd January 2024. The East Hampshire District Council Draft Local Plan 2021-2040 includes the following relevant policies: • Policy CLIM5 – Climate Resilience • Policy NBE7 – Managing Flood Risk Policy CLIM5 sets out the requirement to consider avoiding and minimising the risks associated with a changing climate in the design and location of a development. Policy NBE7 sets out the requirements to consider the overall risk of any sources of flooding and the inclusion of sufficient flood protection, resilience and resistance measures.
Havant Borough Council Local Plan, Local Plan Consultation, 2018	The Havant Borough Council Local Plan is made up of the following: • The Havant Borough Local Plan (Core Strategy) (2011) • The Havant Borough Local Plan (Allocations) (2014) • The Emsworth Neighbourhood Plan (2021)	The consultation for the Havant Borough Council Local Plan Consultation 2018 was withdrawn on 16th March 2022. A new Local Plan is in development and consultation of the draft plan is expected in late 2024.
Portsmouth Water WRMP, 2019	Portsmouth Water Revised WRMP 2019 (December 2022)	The Portsmouth Water WRMP, 2019 was revised in December 2022 with the updated version being the Portsmouth Water WRMP 2019 (December 2019). The 2019 plan was revised in line with statutory requirements and focused on using latest available information to inform the planning for a 1 in 200 year drought event.

16.4 Study Area

- 16.4.1 The study area for the Vulnerability of Climate Change assessment presented in the 2020 ES has not changed.

16.5 Assessment Methodology

- 16.5.1 The assessment methodology presented in the 2020 ES for the Vulnerability of Climate Change has not changed and no amendments are proposed.

16.6 Baseline Environmental Conditions

- 16.6.1 The study area for the Vulnerability to Climate Change assessment presented in the 2020 ES is the same as for the Scheme with the proposed changes detailed in **Chapter 2: Changes to the Scheme**.
- 16.6.2 The current climate baseline presented in the 2020 ES was based on data from the Meteorological Office in South East England River Basin for the 1981-2010 period. The current baseline is still applicable with consideration for the proposed changes and no updates are required.
- 16.6.3 For the future climate baseline, the climate projection data in the 2020 ES were obtained from the United Kingdom Climate Projections (UKCP18) database for the South East England River Basin for the 2071 to 2089 period. No updates are required for the future climate conditions as the 2020 ES baseline is still representative for the Scheme with the proposed changes.
- 16.6.4 Therefore, there are no updates to the baseline environmental conditions for the Vulnerability to Climate Change assessment of the Scheme detailed in the 2020 ES.

16.7 Assessment of Potential Impacts during the Construction Phase

- 16.7.1 The proposed changes to the Scheme detailed in **Chapter 2: Changes to the Scheme** will not affect the potential impacts of climate variability and climate change identified in the 2020 ES for the Scheme's construction phase. It is noted that the construction period would be extended by two years due to the increased activities associated with the proposed changes. The extended construction duration is not considered to affect the previously assessed impact of climate change to the construction of the Scheme therefore deemed not to be significant.

16.8 Assessment of Potential Impacts during the Operational Phase

- 16.8.1 The proposed changes to the Scheme detailed in **Chapter 2: Changes to the Scheme** will not affect the potential impacts of climate variability and climate change identified in the 2020 ES for the Scheme's operational phase.

16.9 Design, Mitigation and Enhancement Measures

- 16.9.1 The measures detailed in the 2020 ES is suitable and no further design, mitigation and enhancement measures are required.

16.10 Assessment of Effects

- 16.10.1 The assessment of effects presented in the 2020 ES is suitable and no further assessment of effects is required.

16.11 Monitoring

- 16.11.1 The monitoring recommendations made in the 2020 ES are suitable and no further monitoring is required.

16.12 Summary

- 16.12.1 A number of relevant legislation and policies were identified to have been updated since the 2020 ES. Although there are some policy updates since the 2020 ES the conclusion presented in the 2020 ES for Scheme's Vulnerability to Climate Change is still valid for the proposed changes to the Scheme.

17 Population and Human Health

17.1 Competent Expert Evidence

17.1.1 This chapter provides an addendum to the population and human health assessment included within the 2020 ES and should be read in conjunction with the following documents:

- 2020 ES Chapter 18: Population and Human Health (Vol 2 Chapter 18; Document Reference: HTR-ATK-ZZ-ZZ-RP-Z-0118);
- ES Addendum **Chapter 6: Air Quality**;
- ES Addendum **Chapter 9: Ground Conditions**;
- ES Addendum **Chapter 10: Landscape and Visual**; and
- ES Addendum **Chapter 11: Noise and Vibration**.

17.1.2 This assessment considers the potential effects on health and wellbeing arising from the proposed changes to the Scheme, as summarised in the sections below.

17.1.3 The population and human health chapter of the ES Addendum has been prepared by an environmental consultant with over 30 years' experience in undertaking environmental impact assessments and is a Member of the Institution of Environmental Sciences.

17.2 Review of Legislative and Policy Framework

17.2.1 The legislation, policy and guidance presented in the 2020 ES Chapter 18: Population and Human Health Chapter remain unchanged, except for those policies described in **Table 17-1**.

Table 17-1: Summary of changes to legislation and policies relevant to the assessment of population and human health

2020 ES Legislation/Policy/Guidance	Current Legislation/Policy/Guidance	Summary of Updates
National		
NPPF 2019	NPPF December 2023	The NPPF 2023 issued on 19 th December 2023 replaces the previous 2019 version. The chapter headings and contents have been changed and there have been some modifications to the text. However, the changes to the content do not materially affect the proposed changes to the Scheme as they still accord with the NPPF.
Draft NPSWRI 2018	NPSWRI 2023	The NPSWRI is no longer in draft format and was published in April 2023. The paragraph numbers have been modified, however the content covered in the 2020 ES remains unchanged.
PPG: Healthy and Safe Communities – November 2019	PPG: Healthy and Safe Communities – August 2022	PPG: Healthy and Safe Communities was updated in August 2022, however the updates are not relevant to the Scheme. The summary published in the 2020 ES remains relevant.
Local		

2020 ES Legislation/Policy/Guidance	Current Legislation/Policy/Guidance	Summary of Updates
Havant Borough Council Local Plan 2036	Havant Borough Local Plan 2036	The Havant Borough Local Plan 2036 was withdrawn from examination on 16 th March 2022. A new Local Plan, 'The Building a Better Future Plan', is currently in development. The consultation document notes that " <i>Plans should promote a sustainable pattern of development that aligns growth and infrastructure</i> " and that policies should set out " <i>an overall strategy and make safe provision for infrastructure for... community facilities, green infrastructure and adaptation to climate change</i> " which it states includes health infrastructure.
East Hampshire District Council Adopted Local Plan	East Hampshire District Draft Local Plan (2021 – 2040)	The adopted policies stated in the 2020 ES remain largely unchanged, with new policies in the draft local plan as detailed below. Policy HWC1: Health and Wellbeing of Communities states that " <i>developments should contribute to healthy and active lifestyles</i> ". Policy DGC5: Provision and enhancement of open space, sport and recreation sets out the need for and importance of open space, sport and recreational spaces.
Hampshire Joint Strategic Needs Assessment (JSNA) 2017-2022	Hampshire and Isle of Wight JSNA ⁵²	Updates to the Hampshire and Isle of Wight JSNA include updates to small area life expectancy and inequalities and an update the Healthy People: Quality and Outcomes Framework with data from 2021/22. Reports for JSNA Healthy Places and JSNA Healthy Lives were published in March 2022 and July 2022 respectively. In the Healthy Places report, green spaces are recognised as important assets to support health and wellbeing.

17.3 Study Area

17.3.1 The study area remains unchanged from the 2020 ES.

17.4 Assessment Methodology

17.4.1 The assessment methodology remains unchanged from the 2020 ES, however the baseline data in the ES Addendum uses demographic data based on the 2021 Census, rather than the 2011 Census data used in the 2020 ES.

17.5 Assessment Assumptions and Limitations

17.5.1 Changes to baseline environmental conditions for the ES Addendum have been identified via desk-based studies only. Other assumptions and limitations remain unchanged from the 2020 ES.

⁵² [Joint Strategic Needs Assessment \(JSNA\) | Health and social care | Hampshire County Council \(hants.gov.uk\)](https://hants.gov.uk/joint-strategic-needs-assessment-jsna/)

- 17.5.2 The death rate for cardiovascular disease, detentions under the Mental Health Act 1983, levels of deprivation, unemployment and average household income have not substantially changed since publication of the 2020 ES (Tables 18-14, 18-15, 18-16, 18-17 and 18-18 respectively of the 2020 ES Chapter 18: Population and Human Health).

17.6 Updates to Baseline Environmental Conditions

- 17.6.1 The Boundary Commission for England updated the wards in the East Hampshire County Constituency following the 2023 Period Review of Westminster Constituencies, however this does not influence the demographic and general health data presented in **Table 17-2** and **Table 17-3** respectively, which used data from the 2021 Census, before the ward boundaries were redrawn.

Access to Open Space

- 17.6.2 There is no change to access to open space as presented in the 2020 ES.

Access to Opportunities for Recreation and Leisure

- 17.6.3 There is no change to the opportunities for recreation and leisure as presented in the 2020 ES.

Active Travel

- 17.6.4 Since the publication of the 2020 ES, mitigation measures carried out as part of the enabling works for the Scheme have required the planned temporary closure or diversion of permissive footpaths and a bridleway. Bridleway 120, which extends across the reservoir site from east to west, has been temporarily diverted to the north along Forestry England tracks in Havant Thicket for the duration of the reservoir works.

Access to Work and Training

- 17.6.5 Since the publication of the 2020 ES, additional businesses in the vicinity of Warren Park, Leigh Park and Rowlands Castle which have since been identified.
- 17.6.6 In the vicinity of Warren Park, the following businesses have been identified in addition to those in the 2020 ES:
- Used car dealership;
 - Construction company;
 - Handyman services;
 - Beauty salon;
 - Hot tub shop; and
 - Convenience store.

17.6.7 In the vicinity of Leigh Park, the following businesses have been identified in addition to those in the 2020 ES:

- Roofing company; and
- Shopping centre which includes several businesses.

17.6.8 In the vicinity of Rowlands Castle, the following businesses have been identified in addition to those in the 2020 ES:

- Clothing shop;
- Jewellery shop;
- Sweet shop;
- Florist;
- Roofing; and
- Kitchen furniture shop.

Access to Healthcare Services, Education and Social Infrastructure

17.6.9 In addition to the social infrastructure listed in the 2020 ES, the following have also been identified:

- YMCA Warren Park;
- St Clare's Church;
- St Clare's Pre-School;
- Girls and Boys Day Nursery Warren Park;
- Park Middle School; and
- Havant Academy.

Risk of Injuries and Death

17.6.10 No existing risk of injury or death have been identified.

Public Health Profile

17.6.11 Data from the 2021 Census from the Office of National Statistics have been used to examine the public health profile. A comparison between local and national average data on communities with increased susceptibility to health issues (i.e. % population under 15 and % population over 65) is set out in **Table 17-2** to the most recent data available from the 2021 Census, which is rounded to the nearest 100 people. **Table 17-2** also presents the data from Table 18-11 of the 2020 ES Chapter 18: Population and Human Health.

- 17.6.12 Havant Borough and the wards of Rowlands Castle, Bedhampton and St Faiths have below the national average proportion of under 15s in the population, whereas East Hampshire and the wards of Warren Park and Battins have above the national average proportion of under 15s in the population.
- 17.6.13 Havant Borough, East Hampshire and the wards of Rowlands Castle, Bedhampton and St Faiths have above the national proportion of over 65s, whereas the wards of Warren Park and Battins have below the national proportion of over 65s.

Table 17-2: Data from the 2020 ES (2011 Census) and the ES Addendum (2021 Census) showing the demographic profile of the local area

Geography	2020 ES			ES Addendum		
	Population	% Under 15	% Over 65	Population	% Under 15	% Over 65
Havant Borough	120,684	6.4%	11%	124,200	17.2%	24.3%
East Hampshire	115,608	3.35%	19.29%	125,700	17.4%	23.1%
Rowlands Castle	2,530	2.65%	27.55%	3,200	13.3%	28.4%
Warren Park	7,619	4.75%	10.85%	7,600	24.3%	12.8%
Bedhampton	8,835	2.98%	21.63%	9,400	14.8%	21.7%
Battins	7,062	3.82%	14.40%	7,000	21.4%	15.2%
St Faiths	8,882	2.53%	22.24%	10,300	15.1%	23.9%
England	53,012,456	18.9%	16.4%	56,490,000	17.3%	18.4%

- 17.6.14 The general health of the local population compared to the national picture is set out in **Table 17-3** with data from the 2021 census. Data from Table 18-11 of the 2020 ES Chapter 18: Population and Human Health is also presented in **Table 17-3**.
- 17.6.15 Havant Borough and the wards of Warren Park, Bedhampton and Battins are below the national average for very good health, which is unchanged from the 2020 ES. Warren Park and Battins are also above average for very bad health, which is unchanged from the 2020 ES.
- 17.6.16 The general health of Havant Borough compared to the England average remains unchanged from the 2020 ES, where the proportion of the population in very good health is below the national average, and good health, fair health, bad health and very bad health are above the national average.
- 17.6.17 East Hampshire is above the England average for population in very good health and good health, and is below the England average for fair, bad and very bad health, as per the 2020 ES.

- 17.6.18 Rowlands Castle is above the England average for population very good health and good health, and is below the national average for bad health, as per the 2020 ES. In the 2020 ES, Rowlands Castle was above the national average for fair health and very bad health but has since changed to below the national average.
- 17.6.19 As per the 2020 ES, Warren Park remains below the national average for proportion of population in very good health, and above the national average proportion for population in good health, fair health, bad health and very bad health.
- 17.6.20 As per the 2020 ES, Bedhampton remains below the national average proportion for population in very good health, and above the national average proportion for population in good and fair health. In the 2020 ES, the proportion of population in bad health in Bedhampton was below the England average and is now above. Bedhampton was previously above the national average for very bad health and is now in line with the England average.
- 17.6.21 As per the 2020 ES, Battins is below the national average for very good health, and above the national average for fair, bad and very bad health. In the 2020 ES, Battins was below the national average for the proportion of population in good health but is now above.
- 17.6.22 As per the 2020 ES, St Faiths remains above the national average for the proportion of population in good health, and below for fair health and bad health. St Faiths was previously above the England average for proportion of the population in very good health and is now inline with the England average. St Faiths was previously above the England national average for very bad health and is below.

Table 17-3: Data from the 2020 ES (2011 Census) and the ES Addendum (2021 Census) showing the general health of the local population

Geography	2020 ES					ES Addendum				
	Very Good Health	Good Health	Fair Health	Bad Health	Very Bad Health	Very Good Health	Good Health	Fair Health	Bad Health	Very Bad Health
Havant Borough	44.31%	35.86%	14.24%	4.29%	1.26%	44.3%	35.6%	15.5%	4.4%	1.2%
East Hampshire	50.45%	34.70%	11.15%	2.89%	0.82%	50.8%	34.3%	11.4%	2.9%	0.7%
Rowlands Castle	47.98%	36.59%	14.17%	4.12%	1.26%	51.4%	33.8%	11.4%	2.5%	0.8%
Warren Park	44.51%	34.49%	14.21%	5.18%	1.60%	43.4%	34.3%	14.9%	5.7%	1.7%
Bedhampton	43.86%	36.59%	14.17%	4.12%	1.26%	45.2%	36.0%	13.4%	4.1%	1.2%
Battins	42.51%	34.06%	15.86%	5.61%	1.97%	41.3%	34.5%	16.7%	5.7%	1.9%
St Faiths	47.95%	35.18%	12.55%	3.30%	1.01%	48.5%	34.5%	12.4%	3.6%	1.0%
England	47.2%	34.2%	13.1%	4.2%	0.9%	48.5%	33.7%	12.7%	4.0%	1.2%

- 17.6.23 Limitations on day-to-day activities for HBC, EHDC and the wards of Rowlands Castle, Warren Park, Bedhampton, Battins and St Faiths and England are shown in **Table 17-4**.
- 17.6.24 In both Havant Borough and East Hampshire, there has been a reduction in the population whose day-to-day activities are limited a lot, an increase in population whose day-to-day activities are limited a little, and an increase in the population who are not disabled under the Equality Act compared to the 2020 ES.
- 17.6.25 There is no change to limitations on day-to-day activities for Rowlands Castle compared to the 2020 ES.
- 17.6.26 The proportion of population whose day-to-day activities are limited a lot in Warren Park remains above the England average, and the proportion of the population who are not disabled remains below the national average, as per the 2020 ES. There has since been an increase of the proportion of population whose day-to-day activities are limited a little.
- 17.6.27 There is no change to the proportion of population in Bedhampton and Battins who have limitations on day-to-day activities compared to the 2020 ES.
- 17.6.28 St Faiths remains below the national average proportion of population whose day-to-day activities are limited a lot, as per the 2020 ES. In the 2020 ES, the proportion of population in St Faiths whose day-to-day activities were limited a little was above the England average and is now below the national average. The proportion who were not disabled was previously below the national average and is now above.

Table 17-4: Data from the 2020 ES (2011 Census) and the ES Addendum (2021 Census) showing limitations on day-to-day activities

Geography	2020 ES			ES Addendum		
	Day-to-Day Activities Limited a lot	Day-to-Day Activities Limited a little	Not Disabled under the Equality Act	Day-to-Day Activities Limited a lot	Day-to-Day Activities Limited a little	Not Disabled under the Equality Act
Havant Borough	8.82%	10.52%	80.66%	7.6%	11%	81.3%
East Hampshire	6.40%	8.51%	85.08%	5.2%	9.6%	85.3%
Rowlands Castle	7.63%	9.25%	83.12%	5.99%	11.24%	82.77%
Warren Park	9.37%	8.93%	81.12%	11.86%	14.32%	73.81%
Bedhampton	8.89%	10.74%	80.37%	8.49%	12.83%	78.68%
Battins	10.38%	11.06%	78.56%	11.92%	15.39%	72.68%
St Faiths	7.98%	10.44%	81.58%	7.56%	11.17%	81.27%

Geography	2020 ES			ES Addendum		
	Day-to-Day Activities Limited a lot	Day-to-Day Activities Limited a little	Not Disabled under the Equality Act	Day-to-Day Activities Limited a lot	Day-to-Day Activities Limited a little	Not Disabled under the Equality Act
England	8.3%	9.3%	82.4%	8.42%	11.39%	80.19%

Levels of Deprivation

17.6.29 The unemployment rate and average household income gross weekly pay has been examined following the proposed changes to the Scheme.

17.6.30 **Table 17-5** presents an overview of the change in unemployment since the publication of the 2020 ES. The unemployment rate in Havant, East Hampshire and Hampshire have increased since the 2020 ES. Havant is now above the national unemployment rate, where previously it was below the national. East Hampshire and Hampshire remain below the average for Great Britain.

Table 17-5: Unemployment rate

Geography	Unemployment Rate - 2020 ES	Unemployment Rate - ES Addendum
Havant BC	3.2%	4%
East Hampshire	2.1%	3.1%
Hampshire	2.7%	2.9%
Great Britain	3.9%	3.7%

Data source: <https://www.nomisweb.co.uk/>

17.6.31 **Table 17-6** presents an overview of the change in household income since the publication of the 2020 ES. As per the 2020 ES, the average household income gross weekly pay is above the average for Great Britain in Havant, East Hampshire and Hampshire.

Table 17-6: Average household income gross weekly pay

Geography	Average household income gross weekly pay – 2020 ES	Average household income gross weekly pay – ES Addendum
Havant	£594.70	£689.80
East Hampshire	£654.50	£732.00
Hampshire	£636.40	£731.00
Great Britain	£587.00	£682.60

Data source: <https://www.nomisweb.co.uk/>

17.7 Assessment of Potential Impacts during the Construction Phase

Access to Open Space

- 17.7.1 The proposed changes to the Scheme would increase the duration of construction works by approximately two years. Therefore, access to Staunton Country Park and Havant Thicket would be affected by construction traffic using access roads, either within, or adjacent to these open spaces, for a longer duration.

Access to Opportunities for Recreation and Leisure

- 17.7.2 The proposed impacts on recreation and leisure during construction identified in the 2020 ES would not change however, the duration of effects experienced by users of recreation and leisure facilities would increase, as the construction period would be extended by two years.

Active Travel

- 17.7.3 The extension of the construction period by two years would result in permissive footpaths and bridleways being temporarily closed or diverted for a longer duration. For example, Bridleway 120, which extends across the reservoir site would be the subject of a temporary diversion to the north along Forestry England tracks in Havant Thicket for a longer duration.

Access to Work and Training

- 17.7.4 The extension of the construction period by two years would increase the period of potential disruption to the daily transport/delivery movements of businesses due to temporary road closures and/or movement of construction traffic. The extension of the construction period by two years could also increase the duration of impacts on local businesses on the northern approach to the reservoir site, for example from changes in amenity and/or accessibility.

Access to Healthcare Services, Education and Other Social Infrastructure

- 17.7.5 No impacts on accessing social infrastructure during construction of the reservoir were identified in the 2020 ES and no change to the assessment has been identified.

Risk of Injuries and Death

- 17.7.6 No significant construction health and safety impacts were identified in the 2020 ES and no change to the assessment has been identified.

Impact Magnitude

17.7.7 The magnitude of health determinant impacts is presented in **Table 17-7** for the construction phase. This shows the assessment presented in the 2020 ES and any changes to impact magnitude arising from the proposed changes to the Scheme. A Moderate magnitude of impact has been identified for access to opportunities for recreation and leisure during construction, as access to open space would be temporarily restricted for an additional two years.

Table 17-7: Reservoir construction phase - health determinant impacts

Health Determinant	Impact Description	Impact Magnitude (2020 ES)	Change to Impact Magnitude presented in the 2020 ES?
Air pollution	The generation of dust during vegetation removal and earthworks construction, and traffic emissions from construction was identified in the 2020 ES. The proposed changes to the Scheme would not result in any greater effects than those presented in the 2020 ES.	Minor	No change
Access to open space	A temporary loss of access to open space was identified in the 2020 ES. With the proposed changes to the Scheme, access to open space would be affected over a longer duration.	Moderate	No change
Access to healthcare services, education and other social infrastructure	No impacts were identified in the 2020 ES. With the proposed changes to the Scheme, no additional impacts have been identified.	Negligible	No change
Risk of injuries and death	No significant construction health and safety impacts were identified in the 2020 ES. With the proposed changes to the Scheme, no change to the assessment has been identified.	Negligible	No change
Access to opportunities for recreation and leisure	Temporary restrictions on access to Havant Thicket during construction were identified in the 2020 ES. With the proposed changes to the Scheme, access to open space would be temporarily restricted for an additional two years.	Minor	Moderate
Active travel	The 2020 ES reported that the bridleway and permissive paths would be the subject of short diversions around the construction site, but the diversions were not expected to discourage the use of them. The proposed changes to the Scheme would not result in any greater effects than those presented in the 2020 ES.	Minor	No change
Access to work and training	The 2020 ES reported that the construction of the Scheme would generate new employment opportunities, which could provide financial security and contribute to self-esteem, particularly for low-income groups in the area. Construction would support the local supply chain.	Moderate Beneficial	No change

Health Determinant	Impact Description	Impact Magnitude (2020 ES)	Change to Impact Magnitude presented in the 2020 ES?
	The proposed changes to the Scheme would have similar impacts to those presented in the 2020 ES.		
Soil and water pollution	The 2020 ES reported that contamination of soil could arise from on-site and off-site sources and a risk of temporary watercourse pollution as a result of reservoir dewatering activities. The proposed changes to the Scheme would not result in any greater impacts than those presented in the 2020 ES.	Negligible	No Change
Noise pollution and vibration	The 2020 ES reported that noise from construction of the northern site access road and/or from night-time works could arise, and from vibration arising from earth compaction activities. The proposed changes to the Scheme would not result in any greater impacts than those presented in the 2020 ES.	Minor	No change

17.8 Assessment of Potential Impacts during the Operational Phase

- 17.8.1 The impacts of the proposed changes to the Scheme during operation would remain the same as those presented in the 2020 ES.

17.9 Design, Mitigation and Enhancement Measures

- 17.9.1 The design, mitigation and enhancement measures identified in the 2020 ES, and any additional measures identified in this ES Addendum would be adopted in order to minimise the effects on physical health from the potential effects of air, water and noise pollution.

Reservoir - Construction

- 17.9.2 The mitigation measures are outlined in Table 3-1: REAC: Reservoir Site of the OEMP which forms part of the 2020 ES (Vol 4 Appendix 2.1; Document Reference: HTR-ATK-XX-XX-RP-Z-0069).

Reservoir - Operation

- 17.9.3 The design, mitigation and enhancement measures during operation would remain the same as those presented in the 2020 ES.

17.10 Assessment of Effects

- 17.10.1 The effects on population and human health are assessed by bringing together the assessment of the receptors' sensitivity with the magnitude of impacts to health determinants.

Reservoir - Construction

- 17.10.2 Table 18-27 in the 2020 ES identifies the effects on human health during the construction phase of the reservoir. With the proposed changes to the Scheme, access to open space would be temporarily restricted for an additional two years, and therefore, a moderate adverse effect on access to opportunities for recreation and leisure would be experienced by all receptors, compared to slight adverse, or moderate/slight adverse effects presented in the Table 18-27 of the 2020 ES.
- 17.10.3 **Table 17-8** provides a summary of the construction phase effects on population and human health arising from the proposed changes to the Scheme. A moderate adverse effect on access to opportunities for recreation and leisure would be experienced by all receptors, as access to open space would be temporarily restricted for an additional two years. With mitigation, a slight adverse effect would be experienced by users accessing the site for recreation and leisure. All other construction phase effects on health determinants (air pollution, access to open space, access to healthcare services, education and other social infrastructure, risk of injuries and death, active travel, access to work and training, soil and water pollution, and noise pollution and vibration) remain unchanged, as per the 2020 ES.

Reservoir - Operation

- 17.10.4 There is no change to the population and human health assessment for the operational phase of the Scheme presented in the 2020 ES.

Table 17-8: Updated summary of potential impacts of the construction phase on population and human health

Activity*	Receptor	2020 ES Impact Assessment			2020 ES Mitigation Measures	2020 ES Residual Effect	ES Addendum Impact Assessment			ES Addendum Mitigation Measures	ES Addendum Residual Effect
		Receptor Sensitivity	Impact Severity	Impact Relevance			Receptor Sensitivity	Impact Severity	Impact Relevance		
Access to opportunities for recreation and leisure	Children and adolescents	High	Minor	Moderate or Slight Adverse	See 2020 ES Chapter 18: Population and Human Health Table 18-30.	Slight Adverse	High	Moderate	Moderate Adverse	As per the 2020 ES Chapter 18: Population and Human Health Table 18-30.	Slight Adverse
	Older people	Medium	Minor	Slight Adverse		Slight Adverse	Medium	Moderate	Moderate Adverse		Slight Adverse
	People who are disabled and/or with other health problems	Medium	Minor	Slight Adverse		Slight Adverse	Medium	Moderate	Moderate Adverse		Slight Adverse
	Low-income groups	High	Minor	Moderate or Slight Adverse		Slight Adverse	High	Moderate	Moderate Adverse		Slight Adverse

* Note: All other construction phase effects on health determinants remain unchanged, as per the 2020 ES.

17.11 Monitoring

17.11.1 There is no change to the monitoring of effects as presented in the 2020 ES.

17.12 Summary

Reservoir - Construction

17.12.1 With mitigation, all construction phase residual effects on health determinants remain unchanged, as per the 2020 ES.

Reservoir - Operation

17.12.2 There is no change to the effects on population and human health as presented in the 2020 ES.

18 Cumulative and In-Combination Effects

18.1 Introduction

- 18.1.1 This chapter provides an addendum to the cumulative and in-combination effects assessment included within the 2020 ES Chapter 19: Cumulative and In-Combination Effects (Vol 2 Chapter 19; Document Reference: HTR-ATK-ZZ-ZZ-RP-Z-0119).

18.2 Competent Expert Evidence

- 18.2.1 The Cumulative and In-Combination Effects chapter has been undertaken by technical specialists responsible for the respective technical chapters presented in this ES Addendum.

18.3 Review of Legislative and Policy Framework

- 18.3.1 A review of legislation and policies governing the assessment of cumulative and in-combination effects has been undertaken. The European Directive 2011/92/EU referenced in the 2020 ES is no longer applicable to the UK.

18.4 Study Area

- 18.4.1 The study area for the assessment of in-combination effects reflects the study areas, also termed the Spatial Zol, identified within the relevant topic chapters of the ES Addendum, therefore any changes from the 2020 ES is detailed within the relevant topic chapters.
- 18.4.2 The study area for the identification of 'other development' for inclusion in the assessment of cumulative effects is based upon thresholds and spatial areas. The thresholds and Zol's are based upon professional judgement and take into account the nature and location of 'other development' and the Zol's for individual environmental topics. Each environmental specialist applies the Zol specific to their environmental topic.

18.5 Assessment Methodology

- 18.5.1 For consistency, the methodology used in the 2020 ES for the assessment of in-combination (synergistic) and cumulative (additive) effects has been adopted in the ES Addendum.

Cumulative Effects

18.5.2 Cumulative impacts may arise from the combined effects of several different projects, in combination with the proposed changes to the Scheme. The principle of the cumulative assessment is based on the four-stage assessment approach to cumulative assessment for Nationally Significant Infrastructure Projects, as outlined by the Planning Inspectorate in Advice Note 17:

- Stage 1: Establish the Scheme's Zol and Long List of 'Other Development';
- Stage 2: Identify Shortlist of 'Other Development' - apply threshold criteria based on temporal scope, the scale and nature of other development and any other relevant factors to assist in deciding whether to include or exclude 'other development';
- Stage 3: Information Gathering - compile detailed information on the 'other development' shortlisted, including proposed design and location, programme of construction, operation and decommissioning and environmental assessment information; and
- Stage 4: Assessment - assess the cumulative effects of the Scheme with the 'other development' based on factors including duration of effect, extent of effect, type of effect, frequency of the effect, value and resilience of receptors and likely success of mitigation.

18.5.3 Further details on each stage are provided below.

Stages 1 and 2

18.5.4 Stages 1 and 2 have been combined in this chapter, as the long list was already defined and refined to a shortlist within the 2020 ES. The shortlist of developments considered in the 2020 ES was used as a starting point for developments to be considered within the cumulative assessment for this ES Addendum. However, as the spatial extent of the proposed changes to the Scheme differs to that of the 2020 ES, certain developments are not relevant to the cumulative assessment based on the criteria outlined below. In addition, some developments listed in the 2020 ES have now been completed and therefore would no longer be relevant. The list of developments considered in the 2020 ES has been reviewed taking into account the following criteria (outlined in the 2020 ES) used to identify committed developments:

- Trunk road and motorway projects which have gone through the statutory processes and have been approved;
- Sites allocated for development in adopted local plans or emerging plans that are close to adoption and are within 5 km of the Scheme;

- Planning applications and permissions which are up to five years old;
- All NSIPs listed on the Planning Inspectorate programme of projects within 5 km of the Scheme;
- Planning applications and permissions accompanied by an ES or a non-statutory EIA within 5 km of the Scheme;
- Planning applications and permissions that do not include any form of EIA within 500 m of the Scheme;
- Planning applications for major development⁵³ within 500 m of the Scheme; and
- All applications within 250 m of the Scheme.

18.5.5 **Table 18-1** outlines the list of developments considered in the cumulative assessment based on the above criteria.

Table 18-1: Short list of developments considered within the cumulative assessment

Site Reference	Development Description	Development Location	Planning Reference	Scoped in/out of ES Addendum Cumulative Assessment
1	1,944 new dwellings, 76,121 m ² of new employment floorspace and 9,000 m ² of retail floorspace.	Land east of B2149, Elmleigh Road.	Allocation - CS18.1	Scoped in
2	Residential dwellings of 49 units.	Land east of the railway line, south of Bartons Road.	Allocation - UE43	Scoped in
3	Creation of a community health campus with nursing home, extra care accommodation and health centre. New homes including affordable and extra care housing.	A brownfield site on the site of the former Oak Park School.	Allocation - H69	Scoped in
4	Residential dwellings of 72 units.	Located on Dunsbury Way; formerly part of the redevelopment of the Procter and Gamble factory site.	Allocation - L119	Scoped in
5	Residential dwellings of 90 units.	Brownfield site located on the corner of Petersfield Road and Bartons Road.	Allocation - L145	Scoped in
6	Residential dwellings of 116 units.	An open field to the north of the existing built-up Warren Park area of Leigh Park.	Allocation - UE6a	Scoped in

⁵³ As stated in the Atkins 2020 ES: Major development and minor development have been defined in accordance with Article 2 of the Town and Country Planning Development Management Procedure (England) Order 2015. Thresholds for a major development includes more than 10 new houses, a site area of 0.5 ha, the provision of a building or buildings where the floor space to be created by the development is 1,000 square metres or more; and all mineral and waste developments. Development falling below these thresholds is classed as minor development.

Site Reference	Development Description	Development Location	Planning Reference	Scoped in/out of ES Addendum Cumulative Assessment
7	Redevelopment site for provision of 1,300 m ² of new manufacturing and/or warehousing floorspace with between 18 and 36 jobs.	Brownfield site left over from the redevelopment of Procter and Gamble.	Allocation - BD65	Scoped in
8	Residential dwellings homes including affordable housing and local hub of community facilities.	To the east of the site lies the Warren Park Primary School.	Allocation - L25	Scoped in
9	New homes including affordable housing.	Northeast of the Hermitage Stream.	Allocation - L83	Scoped in
10	Opportunity to regenerate and improve district centre. New homes including affordable housing.	Leigh Park District Centre.	Allocation - L138	Scoped in
11	Residential dwellings of 84 units.	Situated on the edge of Cowplain. South of Hazleton Wood and west of Waterlooville Golf Club.	Allocation - W126	Scoped in
12	Development of Greywell Precinct, Park Parade area, Somborne Drive area, Dunsbury way area,	Land south of Bishopstoke Road.	Allocation - KS3	Scoped in
13	New floorspace at Havant and South Downs College for teaching/educational facilities.	Land Northwest of B2129 Petersfield Road, Havant College.	Allocation - KS7	Scoped in
14	Residential development of about 90 dwellings.	Located to the north of Bartons Road, immediately west of Havant Crematorium.	Allocation - H21	Scoped in
15	Residential development of about 15 dwellings.	Located on the south side of Bartons Road.	Allocation - H27	Scoped in
16	Mixed use development of about 90 dwellings and 5,900 m ² of employment floorspace (classes B1, B2, B8).	Located on the corner of Bartons Road and New Lane at the gateway to the New Lane industrial area; immediately north of Marsh Plant Hire.	Allocation - H35	Scoped in
17	Mixed use development of around 45 dwellings and a builder's yard.	Located in a prominent location on the corner of Petersfield Road and Bartons Road.	Allocation - H38	Scoped in

Site Reference	Development Description	Development Location	Planning Reference	Scoped in/out of ES Addendum Cumulative Assessment
18	Mixed-use development of about 560 dwellings, a convenience store, open space and community centre with sporting facilities.	Located on the northern slope of Portsdown Hill as it slopes down towards Crookhorn; immediately south of South Downs Campus of Havant & South Downs College (HSDC) & adjacent to the A3(M).	Allocation - H41	Scoped in
19	Residential development of about 40 dwellings on area of 1.3 ha.	Currently used as golf club practice ground. Anvil Close and Farriers Way serve the properties adjacent to the west of the site with Waterlooville Golf Course bounding the remainder of the site.	Allocation - H48	Scoped in
20	Hybrid planning application comprising outline application for employment uses and hotel with conference facilities and detailed application for new access link road.	Dunsbury Hill Farm, Park Lane, Cowplain, Waterlooville.	Permission - APP/12/00338	Scoped in
21	Restoration of historic path landscape, including refurbishment of follies, conversion of coach house and stable block to create visitor/volunteer facilities.	Sir George Staunton Country Park, Middle Park Way, Havant PO9 5HB.	Permission - APP/17/00736	Scoped out – works complete
22	Conversion of coach house and stable block to create visitor and volunteer facilities and construction of new visitor car park.	Sir George Staunton Country Park, Middle Park Way, Havant PO9 5HB.	Permission - APP/17/00735	Scoped out – works complete
23	A 1 classroom teaching block northeast of existing schools, a 4-classroom teaching block southwest of the existing schools, improvement of existing play areas, creation of a multi-use games area and expansion of the existing car park.	Trosnant Infant and Junior School, Stockheath Lane, Havant PO9 3BD.	Permission - APP/17/00049	Scoped out – >500 m from scheme updates
24	Proposed change of use from a paddock to a temporary overflow car park.	Storey Gardens, Sir George Staunton Country Park, Middle Park Way, Havant, Hampshire, PO9 5HB.	Permission - APP/16/00063	Scoped out – works complete

Site Reference	Development Description	Development Location	Planning Reference	Scoped in/out of ES Addendum Cumulative Assessment
25	AQUIND Interconnector 2000 MW subsea and underground High Voltage Direct Current power transmission link between Normandy and Lovedean substation in Portsmouth.	Land and sea between Normandy and Lovedean substation in Portsmouth.	Application - EN020022	Scoped in – application was initially refused but is being re-determined
26	A 62 ha site allocated for mixed-use development including: 850 dwellings; a Care Village including 100 independent living units and 60 bed extra care provision; about 2 ha industrial (B2) and business use (B1); and new primary school.	Land south of B2149 Havant Road near Rowlands.	Allocation - SA33	Scoped in
27	Approx. 50 dwellings.	Near Durrants.	Allocation - SA39	Scoped in
28	Between 50 and 60 dwellings.	Land east of Bartons Road.	Allocation - SA40	Scoped in
29	Between 100 and 115 dwellings.	Near Little leigh farm.	Allocation - SA41	Scoped in
30	Creation of 700 dwellings, 1.7 ha of employment land, a Local Centre (retail, primary school and community facilities), a Care Village, playing pitches, a cricket pavilion, allotments together footpaths and cycleways).	Land east of Horndean.	Permission - 55562/001	Scoped in
31	Residential-led (C3) mixed-use development with up to 800 dwellings, up to 2 ha of employment land (uses B1 and B2), a Local Centre (including: retail (A1); financial and professional services (A2); restaurants, cafés, and drinking establishments (A3 and A4), hot food takeaways (A5), together with a primary school and community facilities informal and formal open space and allotments.	Land east of Horndean.	Permission - 55562/005	Scoped in
32	Development of 85 restricted dwellings (55+ years) with associated infrastructure, open space and access from Rowlands Castle Road following the demolition of all existing buildings/hardstanding.	Land east of Horndean.	Permission – 55562/006	Scoped in

Site Reference	Development Description	Development Location	Planning Reference	Scoped in/out of ES Addendum Cumulative Assessment
33	Development of a care village with 60-bed care home, a village care centre with up to 60 care-assisted living apartments and up to 60 extra care units comprising bungalows and apartments, with associated parking, landscaping and drainage.	Land east of Horndean.	Permission - 55562/007	Scoped in
34	60-bed care home and up to 50 no. extra care bungalows and apartments with associated parking, landscaping and sustainable drainage.	Land east of Horndean.	Permission - 55562/008	Scoped in
35	Construction of approximately 210 dwellings.	Land north of Long Copse Lane, Emsworth.	Permission - GEN/18/01143	Scoped in

18.5.6 New developments identified since publication of the 2020 ES have been reviewed and compared against the criteria outlined above. Following this review, only one additional development has been considered in the cumulative assessments as detailed in **Table 18-2**.

Table 18-2: Additional developments considered within the cumulative assessment

Site Reference	Description	Development Location	Planning Reference	Distance from Proposed Development
36	Application for mixed use residential development comprising 628 dwellings, community centre, allotments, public open space including play areas, new junction to College Road, related internal access road, footways and cycleways, pumping station and drainage basins.	Land east of College Road, Purbrook, Waterlooville	Application – APP/23/00488	Approximately 2.5 km

Stage 3

18.5.7 Where the construction programme of other developments overlaps with the Scheme, cumulative effects could occur due to overlapping construction activities. For the development at site reference 36, the construction programme is between 2024/25–2030.

Stage 4

18.5.8 **Section 18.10** provides the assessment of cumulative effects for the shortlisted developments outlined in Stage 2.

In-Combination Effects

18.5.9 In-combination effects are the different environmental effects of the same project which affect the same receptor, potentially producing a more significant effect when considered together than when considered in isolation.

18.5.10 In undertaking the assessment, the following receptor groups have been considered:

- Human receptors: residents, including community and private assets, sensitive receptors, cyclists, pedestrians and vulnerable groups;
- Ecological receptors: protected species and existing habitats;
- The water environment;
- Heritage assets;
- Ground conditions; and
- Landscape receptors.

18.5.11 The effects identified in the ES Addendum chapters were assessed to identify potential in-combination effects.

18.5.12 **Table 18-3** below highlights the potential interactions between environmental topics for the Scheme. Potential interactions between topics are shown in dark blue within **Table 18-3**.

Table 18-3: Potential interaction between environmental topics

	Air Quality	Historic Environment	Landscape and Visual	Biodiversity	Ground Conditions	Material Resources and Waste	Noise and vibration	Population and Human Health	Water	Effects on Climate
Air Quality										
Historic Environment										
Landscape and Visual										
Biodiversity										
Ground Conditions										
Material Resources and Waste										
Noise and Vibration										
Population and Human Health										
Water										
Effects on Climate										

18.6 Assessment Assumptions and Limitations

- 18.6.1 The assessment assumptions and limitations presented in the 2020 ES considered the pipeline, reservoir and access roads as a single development within the in-combination assessments, however the pipeline is excluded in the S73 application and is not considered in the ES Addendum.
- 18.6.2 The traffic forecasts used within the 2020 ES applied factors from the DfT's TEMPro database (version 7.2) to account for anticipated traffic growth. The TEMPro database is regularly updated to reflect committed developments. Review of data from the latest version 8.1 of TEMPro reveals that the previous version 7.2 forecasts continue to provide a robust baseline for assessment purposes. The assessment thus continues to include cumulative effects of local developments in transport terms. This data was then carried through and included in the assessment of future noise and air quality impacts.

- 18.6.3 As per the 2020 ES, the process of identifying and subsequently discounting committed developments which have already been implemented was informed by desk study only.

18.7 Update to Baseline Conditions

- 18.7.1 Baseline data for the assessment of cumulative and in-combination effects are set out in each of the topic chapters in the ES Addendum.
- 18.7.2 The shortlist of other developments is summarised in **Table 18-1**. One additional committed development identified since publication of the 2020 ES is set out in **Table 18-2**.

18.8 Potential Impacts

- 18.8.1 There is no change to potential impacts identified in the 2020 ES.

18.9 Design, Mitigation and Enhancement Measures

- 18.9.1 Mitigation measures to minimise cumulative and in-combination effects are identified either in the topic chapters of the ES Addendum or in the planning applications for other developments in **Table 18-1** and **Table 18-2**.

18.10 Assessment of Cumulative Effects

Air Quality

Approach to Cumulative Assessment

- 18.10.1 Other proposed committed developments in the Zol of the Scheme may have the potential to generate cumulative air quality effects, in this case, during the construction phase of the Scheme. Such effects could arise from construction dust and fine particulate matter emissions and also from construction-generated road traffic emissions, where activities from more than one development could overlap. Committed developments that have the potential to generate cumulative effects together with the Scheme are set out in **Table 18-1** and **Table 18-2**. The air quality section of the 2020 ES Chapter 19: Cumulative and In-Combination Effects concluded that there would be no significant cumulative effects arising. Since then, the list of other committed developments has changed, hence the need for re-evaluation.

Cumulative Effects – Construction

- 18.10.2 The Zol for construction dust effects has now changed, as a result of updated technical guidance, to 250 m from the site boundary of developments. However, it is proposed here to retain the original 350 m buffer as a robust and conservative assessment.

- 18.10.3 With regard to effects arising during construction, it is reasonably assumed that all other committed developments that receive planning approval will be required, by planning conditions and other legal mechanisms, to incorporate such mitigation and control measures that would adequately address the management of construction dust and fine particulate matter emissions. Monitoring of dust emissions, whether by instrumental or observational techniques, will identify during the course of overlapping development construction activities, whether any effects could arise, in which case, adjustment of mitigation and control measures in real time will prevent any issues arising.
- 18.10.4 With regard to the effects of construction-related road traffic, especially HGV emissions, the 2020 ES Chapter 7: Air Quality (Vol 2 Chapter 7; Document Reference: HTR-ATK-ZZ-ZZ-RP-Z-0107) identified that all potential effects would be categorised as negligible. The re-evaluation of this, discussed in **Chapter 6: Air Quality**, identifies that, with the later start year and extended duration of construction, effects would be, at worst, the same in magnitude as those described in the 2020 ES and, in all likelihood, of a lesser magnitude. On that basis, it is concluded that it is highly unlikely that any significant cumulative air quality effects would be generated from the interaction of the Scheme with other developments.

Cumulative Effects - Operation

- 18.10.5 As the only likely air quality effects during operation of the Scheme could arise from road traffic emissions, and these have been deemed to be minimal and well below the threshold criteria for detailed assessment, it is concluded that no significant cumulative air quality effects will arise.

Historic Environment

Approach to Cumulative Assessment

- 18.10.6 There will be no change to the cumulative assessment presented in the 2020 ES. The 2020 ES considered proposed developments at site references 6, 11, 21, 22, 23 and 24 (**Table 18-2**) for both the construction and operational phases of the Scheme.
- 18.10.7 The ZoI for Historic Environment is 500 m from the planning application boundary, therefore the additional project identified in **Table 18-2** (site reference 36) is not considered further as it falls outside of this area.
- 18.10.8 The developments at site references 21, 22 and 24 are now scoped out as the work has now been completed, with site reference 23 now more than 500 m from the planning application boundary.

Cumulative Effects - Construction

- 18.10.9 The cumulative effects identified during construction remain the unchanged from the 2020 ES. The majority of these were focussed on in-combination effects arising from works within the RPG and Conservation Area, developments at site references 21-24, which are now scoped out of this assessment.
- 18.10.10 Only negligible cumulative effects are anticipated, which are classified as not significant. No additional mitigation is required.

Cumulative Effects - Operation

- 18.10.11 The cumulative effects identified during operation remain unchanged from the 2020 ES.
- 18.10.12 The development at site reference 6 has potential for minor indirect impacts on the significance of the Grade II* Leigh Park RPG and Sir George Staunton Conservation Area due to an additional development near the setting of a small portion of the boundary of the RPG and Conservation Area. This is a possible negligible cumulative effect with mitigation through landscaping and is not significant.
- 18.10.13 The development at site reference 11 will not have a cumulative impact on the RPG or Conservation Area and has a neutral effect.
- 18.10.14 The developments at site references 21-24 have been scoped out.

Biodiversity

Approach to Cumulative Assessment

- 18.10.15 Potential cumulative effects on biodiversity may occur from interaction with other proposed (committed) developments located near the Scheme during construction and operation. Cumulative effects on biodiversity receptors could occur through construction activities associated with the proposed changes to the Scheme and other developments, including noise, lighting, changes in air quality and loss or severance of habitat. The biodiversity section of the 2020 ES Chapter 19: Cumulative and In-Combination Effects concluded that there would be no significant cumulative effects arising. Since then, the list of other committed developments has changed, hence the need for re-evaluation.

- 18.10.16 Given the localised nature of the majority of potential effects, the Zol for cumulative effects does not generally exceed 2 km from the Scheme. The Zol for cumulative effects on bats associated with the internationally designated Singleton and Cocking Tunnels SAC was extended to 3 km from the site due to the mobility of the qualifying bat species.
- 18.10.17 The new development at site reference 36 in **Table 18-2** is approximately 2.5 km from the Scheme and therefore within the extended 3 km Zol for bats associated with the internationally designated Singleton and Cocking Tunnels SAC. Bat activity surveys associated with the development at site reference 36 recorded 10 different bat species, including low and individual number of passes by barbastelle bats, a qualifying species of the Singleton and Cocking Tunnels SAC within the planning application boundary.

Cumulative Effects – Construction

- 18.10.18 With regard to effects arising during construction, it is reasonably assumed that all other committed developments that receive planning approval will be required, by planning conditions and other legal mechanisms, to incorporate such mitigation and control measures that would adequately address the impact on protected species and designated sites. The new development at site 36 has prepared an Environmental Statement Volume 1 Chapter 9: Ecology⁵⁴ stating that the impact assessment for ecology receptors has been carried out in accordance with the CIEEM's Guidelines for Ecological Impact Assessment in the UK Ireland: Terrestrial, Freshwater and Coastal 2nd edition (2016). The ES for the development at site reference 36 concludes that, with embedded mitigation, there is considered to be no significant adverse effect to bats (of all species recorded) during construction. Therefore, no significant cumulative effect to the SAC qualifying species barbastelle bats in relation to the Scheme is expected. Therefore, the cumulative effects identified during construction remain unchanged from the 2020 ES.

Cumulative Effects – Operation

- 18.10.19 The ES for the development at site reference 36 concludes that, with embedded mitigation, there is considered to be no significant adverse effect to bats (of all species recorded) during operation. Therefore, no significant cumulative effect to the SAC qualifying species barbastelle bats in relation to the Scheme is expected. Therefore, the cumulative effects identified during operation remain unchanged from the 2020 ES.

⁵⁴ APP/23/00488 | Application for mixed use residential development comprising 628 dwellings, community centre, allotments, public open space including play areas, new junction to College Road, related internal access road, footways and cycleways, pumping station and drainage basins. | Land East Of, College Road, Purbrook, Waterlooville (havant.gov.uk)

Ground Conditions

Approach to Cumulative Assessment

18.10.20 There will be no change to the cumulative assessment presented in the 2020 ES.

18.10.21 The ZoI for Ground Conditions is 500 m therefore the additional project identified in **Table 18-2** is not considered further as it falls outside of this area.

Cumulative Effects - Construction

18.10.22 The in-combination effects remain the same for the construction phase presented within the 2020 ES. Therefore, it is not expected that the combined impact of these cumulative effects would be greater than those effects predicted for ground conditions as outlined in **Section 8.3**. Only negligible to minor adverse cumulative effects are anticipated, which are classified as not significant. No additional mitigation is anticipated.

Cumulative Effects – Operation

18.10.23 The in-combination effects remain the same for the operation phase as discussed within the 2020 ES. Therefore, it is not expected that cumulative effects would be greater than those effects predicted for ground conditions as outlined in **Section 8.4**. Only negligible to minor adverse cumulative effects are anticipated, which are classified as not significant. No additional mitigation is anticipated.

Landscape and Visual

Approach to Cumulative Assessment

18.10.24 There will be no change to the cumulative assessment presented in the 2020 ES for the other developments identified in the 2020 ES Chapter 19: Cumulative and In-Combination Effects.

18.10.25 The developments at site references 21, 22 and 24 are now scoped out as the work has now been completed, with the development at site reference 23 now more than 500 m from the planning application boundary.

18.10.26 The new development at site reference 36 (Land east of College Road, Purbrook, Waterloooville), identified in **Table 18-2** has been scoped out in respect of potential landscape character effects as it is outside the study area of the Landscape and Visual Impact Assessment as mapped in the 2020 ES Figure 11.3: Landscape Character (District and Local) (Vol 3 Chapter 11; Drawing Number: HTR-ATK-ZZ-ZZ-GS-Z-0029). It is also scoped out visually because the extent of the zone of theoretical visibility modelling was agreed at 2 km (see 2020 ES Appendix 11: Landscape and Visual (Vol 4 Appendix 11; Document Reference: HTR-ATK-ZZ-ZZ-RP-Z-0136), paragraphs 1.21 to 1.25).

Cumulative Effects – Construction

18.10.27 The cumulative effects identified during construction remain unchanged from the 2020 ES, as shown in Table 19-5 Cumulative Effects on Landscape Character (the reservoir site and access roads) and Table 19-6 Cumulative Visual Effects (the reservoir site and access roads).

18.10.28 The cumulative construction landscape character and visual effects on the in-combination effects (with the developments at site references 21-24, which are now scoped out of this assessment), remain as previously identified in the 2020 ES.

18.10.29 The Slight and Moderate effects for the landscape character remain as previously identified in the 2020 ES. The Slight and Moderate visual effects also remain as previously identified in the 2020 ES. No additional mitigation is therefore required.

Cumulative Effects – Operation

18.10.30 The cumulative effects identified during construction remain unchanged from the 2020 ES, as shown in Table 19-5 Cumulative Effects on Landscape Character (the reservoir site and access roads), and Table 19-6 Cumulative Visual Effects (the reservoir site and access roads).

18.10.31 The cumulative operation landscape character and visual effects from the proposed changes to the Scheme on the in-combination effects, (with the developments at site references 21-24, which are now scoped out of this assessment), remain as previously identified in the 2020 ES.

Noise and Vibration

Approach to Cumulative Assessment

18.10.32 Potential cumulative effects on noise and vibration may occur from interaction with other proposed (committed) developments located near the Scheme during construction. Cumulative effects on receptors within the noise and vibration study area could occur through construction activities or construction traffic associated with the proposed changes to the Scheme and the other developments. The 2020 ES assessment of cumulative noise effects included developments at site references 4, 6, 7, 8, 9, 10, 12, 13, 26 and 27. Developments at site references at 21, 22, 23 and 24 were also included in the 2020 ES assessment, however these are now scoped out as the work has now been completed. This assessment has been revised to include the assessment of the committed development at site reference 36.

Cumulative Effects – Construction

18.10.33 During the construction of the reservoir, there are a number of other developments in the area which could potentially affect existing sensitive receptors within the noise and vibration study area if construction works were to take place at the same time. This includes both construction and traffic noise.

18.10.34 However, with appropriate mitigation measures in place, as identified in Table 3-1: REAC: Reservoir Site of the OEMP which forms part of the 2020 ES (Vol 4 Appendix 2.1; Document Reference: HTR-ATK-XX-XX-RP-Z-0069) and secured both through the CEMP prepared for the Scheme and in CEMPs prepared for the other developments, it has been assumed that any adverse effects resulting from simultaneous construction activities would be within acceptable levels.

18.10.35 With regard to the effects of construction-related road traffic, especially HGV emissions, the 2020 ES Chapter 12: Noise and Vibration (Vol 2 Chapter 12; Document Reference: HTR-ATK-ZZ-ZZ-RP-Z-0112) identified that all potential effects would be categorised as negligible. The traffic movements are not anticipated to change from those assessed in the 2020 ES, therefore the effects would be, at worst, the same in magnitude as those presented in the 2020 ES. Given the small scale of the development at site reference 36 and the large distance from the Scheme, traffic from this development would not be expected to change the conclusions presented in the 2020 ES. On that basis, it is concluded that it is highly unlikely that any significant cumulative noise effects would be generated by the interaction of other development projects.

18.10.36 Provided the identified mitigation of noise and vibration effects is implemented, there would not be any significant residual cumulative effects.

Cumulative Effects – Operation

18.10.37 As set out in the 2020 ES Chapter 12: Noise and Vibration, once the reservoir is operational, traffic forecasts showed negligible impacts with committed development taken into consideration, therefore significant cumulative effects from traffic are not expected.

Material Resources and Waste*Approach to Cumulative Assessment*

18.10.38 There will be no change to the cumulative assessment for material resources and waste presented in the 2020 ES. The additional project included in **Table 18-2** has been reviewed.

Cumulative Effects - Construction

18.10.39 The 2020 ES confirmed that cumulative effects from the concurrent construction of the Scheme and nearby developments will result in effects through the consumption of primary, recycled or secondary resources and generation of CDE wastes. The potential adverse effects of this on materials are the depletion of resources, including key construction materials (including aggregates). For wastes, this could lead to the reduction in waste management infrastructure capacity.

18.10.40 There is no change to the cumulative assessment for materials and waste from the 2020 ES, the development at site reference 25, the Aquind Interconnector, remains scoped in as this is due to be redetermined. The cumulative assessment remains current, based on the paucity of available data in the applications.

Cumulative Effects – Operation

18.10.41 As described in the 2020 ES, there will be no significant cumulative effects in respect of materials and waste arising from the operation of the Scheme and other committed development.

Water Environment*Approach to Cumulative Assessment*

18.10.42 There will be no change to the cumulative assessment presented in the 2020 ES for the other developments identified in the 2020 ES Chapter 19: Cumulative and In-Combination Effects.

18.10.43 The additional development located at site reference 36, identified in **Table 18-2**, is located approximately 2.5 km to the west of the Havant Thicket Reservoir site. Although the development is not located within the Hermitage Stream catchment (as defined by the Environment Agency), it is located in the catchment of an unnamed stream that drains into the tidal reach of Hermitage Stream in Bedhampton. There is therefore a mechanism for cumulative effects in Hermitage Stream and Langstone Harbour downstream of the confluence between the two watercourses.

Cumulative Effects - Construction

18.10.44 The cumulative effects resulting from construction remain the same as those presented within the 2020 ES. Potential effects on water quality and hydromorphology through the potential for discharges of contaminants and fine sediments and changes to flood risk were not considered to result in any cumulative effects in the 2020 ES, on the basis of best practice construction control measures secured through planning conditions and legal requirements. Both the additional development at site reference 36 and the proposed changes to the Scheme would be subject to a similar suite of control measures. Therefore, it is not expected that the combined impact of these cumulative effects would be greater than those effects on the water environment described in **Section 14.10**.

18.10.45 The cumulative effects assessment presented within the 2020 ES also identifies the potential for effects on ground water quality resulting from the mobilisation of contaminants. However, these are considered to be negligible on the basis of construction-stage pollution prevention and control measures. Both the additional development at site reference 36 and the proposed changes to the Scheme design would be subject to a similar suite of control measures, and it is therefore not expected that the impact of these cumulative effects would be greater than those effects on the water environment described in **Section 14.10**.

Cumulative Effects – Operation

18.10.46 The 2020 ES does not identify any cumulative effects on the water environment during the operation phase of the development. This is not considered to change on account of either the additional development at site reference 36 or the proposed changes to the project design.

Effects on Climate

18.10.47 There is no change to the approach for cumulative assessment presented in 2020 ES in relation to Effects on Climate.

18.10.48 As stated in the 2020 ES, the atmosphere is equally affected by all emissions worldwide. Therefore, the global atmosphere is the receptor for GHG emissions and any GHG emissions released to the atmosphere has the potential to contribute to climate change, as a result, the effects are global and cumulative in nature.

18.10.49 Additionally, the IEMA guide: Assessing Greenhouse Gas Emissions and Evaluating their Significance⁵⁵, states that the effects of GHG emissions from specific cumulative developments should not be assessed individually as there is no basis for selecting which developments to assess cumulatively over any other.

18.10.50 The effects on climate due to GHG emissions is therefore considered inherently cumulative, and no additional consideration for cumulative effects is required. Therefore, it is not appropriate to consider the effects of the Scheme cumulatively, including the additional development presented in **Table 18-2**. The effect of the Scheme is considered in the ES Addendum **Chapter 15: Effect on Climate**.

Population and Human Health

Approach to Cumulative Assessment

18.10.51 There is no change to the approach for cumulative assessment presented in 2020 ES in relation to Population and Human Health.

18.10.52 The ZoI used to identify other proposed (committed) developments and potential receptors and impacts for consideration in the 2020 ES was 500 m from the Scheme planning application boundary. The study area for the cumulative population and health assessment was extended where other technical assessments identified a study area which extended beyond the core area of 500 m.

18.10.53 The following committed developments have been considered in the cumulative assessment for the proposed changes to the Scheme: site references 4, 6, 7, 8, 16, 20, 27, 30, 31, 32, and 34. The developments at site references 22 and 24 have been scoped out, as these works have been completed. Site reference 36 identified in **Table 18-2** is not considered further as this development falls outside the ZoI for Population and Human Health.

⁵⁵ Institute of Environmental Management & Assessment (IEMA) (2020). *Environmental Impact Assessment Guide to: Climate Change Resilience and Adaptation*.

Cumulative Effects - Construction

18.10.54 With regard to the human health effects of construction-related road traffic, the air quality assessment has concluded that it is highly unlikely that any significant cumulative air quality effects would be generated from the interaction of the proposed changes to the Scheme with other developments. Therefore, there is no change to the cumulative effects assessment presented in the 2020 ES.

18.10.55 With respect to the human health effects of noise from construction plant and from construction traffic generated by both the proposed changes to the Scheme and committed developments, the noise and vibration assessment concluded that there would not be any significant residual cumulative effects, provided the identified mitigation of noise and vibration effects is implemented. As such, there is no change to the cumulative effects assessment presented in the 2020 ES.

Cumulative Effects - Operation

18.10.56 The cumulative effects of the proposed changes to the Scheme during operation would remain the same as those presented in the 2020 ES.

18.11 Assessment of In-Combination Effects

18.11.1 The assessment of in-combination effects considers impact interactions associated with the proposed changes to the Scheme on key environmental receptors. Impacts identified by the different environmental topic assessments with the potential to work in combination to affect a particular receptor group were identified via a matrix-based approach (see **Table 18-3**).

18.11.2 A review of the residual effects identified within each of the topic chapters was then undertaken to identify receptors experiencing more than one effect classified as at least minor adverse or equivalent. Receptors potentially experiencing minor or greater adverse effects were included in the assessment. Any negligible or neutral effects were discounted from the assessment. Following the review of residual effects, topics which are likely to have in-combination effects with other topics on a single receptor are summarised in **Table 18-4**. Further explanation of the in-combination effects is described within the following Sections below:

- **Human Receptors;**
- **Ecological Receptors;**
- **Water Environment;**
- **Heritage Assets; and**
- **Landscape Receptors.**

Table 18-4: Assessment of in-combination effects

Receptor	Chapter											Comments
	Air Quality	Historic Environment	Biodiversity	Ground Conditions	Landscape & Visual	Noise & Vibration	Transport	Material Resources & Waste	Water	Effects on Climate*	Population and Human Health	
Human receptors	Y	N	N	Y	Y	Y	Y	N	N	N/A	Y	The population and human health assessment has already taken into consideration the effects on accessibility and visual amenity and the effects of air, noise, soil and water pollution.
Ecological receptors	Y	N	Y	N	Y	Y	N	N	Y	N/A	N	The Biodiversity assessment has already taken into consideration the effects of noise, air quality, water quality and habitat loss on ecological receptors.
Water environment	N	N	Y	Y	N	N	N	N	N/A	N/A	N	Effects on water environment receptors, including hydromorphology and surface and groundwater quality, have been considered in the water environment chapter. They do

Receptor	Chapter											Comments
	Air Quality	Historic Environment	Biodiversity	Ground Conditions	Landscape & Visual	Noise & Vibration	Transport	Material Resources & Waste	Water	Effects on Climate*	Population and Human Health	
												not therefore need to be considered in the context of ecology or ground conditions.
Heritage assets	N	N	N	N	Y	N	N	N	N	N/A	N	
Ground conditions	N	N	N	Y	N	N	N	N	N	N/A	N	
Landscape	N	Y	N	N	Y	N	N	N	N	N/A	N	

* The assessment of in-combination effects is not applicable for the Effects on Climate chapter, as greenhouse gas emissions from the Scheme affect the global atmosphere and is not location or receptor specific. This remains consistent with the 2020 ES.

Human Receptors

- 18.11.3 The in-combination effects on human receptors identified during construction remain unchanged from the 2020 ES.

Ecological Receptors

- 18.11.4 The in-combination effects on ecological receptors identified during construction remain unchanged from the 2020 ES.

Water Environment

- 18.11.5 The 2020 ES does not identify any in-combination effects on the water environment during the operation phase of the development. This is not considered to change on account of either the additional development at site reference 36 or the proposed changes to the project design.

Heritage Assets

- 18.11.6 The in-combination effects identified during construction remain unchanged from the 2020 ES, which identified minor temporary residual in-combination effects arising from the change to the landscape character of Staunton Country Park and change to the setting of Leigh Park RPG.

Landscape Receptors

- 18.11.7 The in-combination effects identified during construction remain unchanged from the 2020 which identified the potential in combination effects on landscape receptors potentially affected including Leigh Park Registered Park and Garden, Sir George Staunton Conservation Area and views from some of the key receptors.

18.12 Monitoring

- 18.12.1 As per the 2020 ES, no monitoring of cumulative or in-combination effects is proposed over and above that recommended in the specialist topic chapters of the ES Addendum.

18.13 Summary

Cumulative Effects

- 18.13.1 The assessment of cumulative effects on air quality, historic environment, biodiversity, ground conditions, landscape and visual, noise and vibration, transport, material resources and waste, water, and population and human health remains unchanged from the 2020 ES.

In-Combination Effects

18.13.2 The assessment of in-combination effects on receptors remains unchanged from the 2020 ES.

19 Conclusion

19.1 Overview

- 19.1.1 This ES Addendum has been prepared to examine the proposed changes to the Scheme which was granted planning permission subject to conditions in October 2021.
- 19.1.2 Design changes have been proposed following the granting of planning permission. To seek approval for these changes, applications under Section 73 of the Town and Country Planning Act 1990 have been submitted.
- 19.1.3 The assessment of significant effects has been undertaken in the topic chapters of this ES Addendum.

19.2 Summary of Residual Effects

- 19.2.1 Following the assessment of impacts of the proposed changes to the Scheme, it is concluded that there are no new or materially different significant effects to those identified in the 2020 ES.
- 19.2.2 **Table 19-1** provides a summary of residual effects for each topic chapter in the ES Addendum.

Table 19-1: Summary of residual effects for topic chapters in the ES Addendum

Chapter	Residual Effects
Air Quality	No adverse effects have been identified that would be significant. As such, the residual effects presented in the 2020 ES remain unchanged.
Historic Environment	The changes to the main reservoir embankment and relocation of the valve tower represent a limited change in the setting of Leigh Park RPG, the Sir George Staunton Conservation Area and the listed buildings within it, but this change is limited and there would be no change to the significance of effects presented in the 2020 ES.
Biodiversity	Although the Scheme construction period would be extended, the impact on ecological receptors is not considered likely to change. As such, the residual effects presented in the 2020 ES remain unchanged.
Ground Conditions	The 2020 ES is still relevant and appropriate for ground conditions in relation to the proposed changes to the Scheme, therefore the residual effects presented in the 2020 ES remain unchanged. The Scheme has not increased beyond the planning application boundary extents, the original baseline conditions remain the same and additional contamination sources have not been identified.
Landscape and Visual	The relocation of the valve tower would be a local modification, limited to a small area of the overall reservoir area, which would not change the previously predicted level of effects in the 2020 ES. The changes to the embankment slope design would have a locally beneficial visual effect on the landscape of the reservoir site area and although there would be some minor adverse effects as a result of the valve tower relocation, it would be limited to a small part of the overall reservoir area. Therefore, the overall effect is no significant change from the previously predicted level of effects in the 2020 ES.
Noise and Vibration	The proposed changes to the Scheme would not result in any greater noise and vibration effects than those presented in the 2020 ES. The mitigation measures proposed in the 2020 ES continue to remain appropriate.
Traffic and Transport	Construction of the amended Scheme can be undertaken within the same anticipated daily maximum vehicular traffic as the 2020 ES. The 2023 future baseline used to assess construction impacts in the 2020 ES remains robust. The traffic impact and consequent effects of construction thus remains

Chapter	Residual Effects
	consistent with that assessed in the 2020 ES. The traffic impact and consequent effects during operation also remains consistent with that assessed in the 2020 ES.
Material Resources and Waste	The 2020 ES remains relevant and appropriate for material resources and waste in relation to the proposed changes to the Scheme, and no change to the residual effects have been identified.
Water	The extension of the main reservoir embankment will not result in any additional loss of hydromorphological elements of Riders Lane Stream, as the longer section of culverted watercourse would have been lost below the reservoir in the Scheme assessed in the 2020 ES. Similarly, extension of the embankment will not result in additional impacts from controlled compensation flows through the culverted section of Riders Lane Stream. As such, the overall assessment of effects remains unchanged from the 2020 ES.
Effect on Climate	The total emissions during construction would decrease compared to the 2020 ES, and there would be no change to emissions during operation. As such, the conclusion of the 2020 ES, that the Scheme is deemed unlikely to cause a significant effect on climate change, remains unchanged.
Vulnerability to Climate Change	No change to the residual effects presented in the 2020 ES have been identified with respect to climate vulnerability.
Population and Human Health	The residual effects identified for population and human health remain unchanged, as presented in the 2020 ES.
Cumulative and In-Combination Effects	The assessment of cumulative and in-combination effects on receptors remains unchanged from the 2020 ES.

Appendix A – List of Documents from the 2020 ES

Introduction

This document provides an overview of the structure of the Environmental Statement submitted in 2020 (2020 ES), submitted as part of the planning application for Havant Thicket Reservoir.

As part of the Section 73 application and the Addendum to the 2020 ES (ES Addendum), the documents listed in **Table A19** have been carefully reviewed and considered and are referenced throughout the ES Addendum.

Structure of the 2020 ES

The structure of the 2020 ES is as follows:

- Volume 1: Non-Technical Summary;
- Volume 2: Main Report;
 - Chapter 1 – Introduction;
 - Chapter 2 – Description of the Development;
 - Chapter 3 – Need for the Reservoir;
 - Chapter 4 – Alternatives Considered;
 - Chapter 5 – EIA Process, Approach and Methodology;
 - Chapter 6 – Consultation;
 - Chapter 7 – Air Quality;
 - Chapter 8 – Historic Environment;
 - Chapter 9 – Biodiversity;
 - Chapter 10 – Ground Conditions;
 - Chapter 11 – Landscape and Visual;
 - Chapter 12 – Noise and Vibration;
 - Chapter 13 – Traffic and Transport;
 - Chapter 14 – Material Resources and Waste;
 - Chapter 15 – Water;
 - Chapter 16 – Effect on Climate;
 - Chapter 17 – Vulnerability to Climate Change;
 - Chapter 18 – Population and Human Health;
 - Chapter 19 – Cumulative and In-Combination Effects;
 - Chapter 20 – Vulnerability to Major Accidents and Disasters;
 - Chapter 21 – Conclusion; and
 - Chapter 22 – Glossary.
- Volume 3: Figures; and
- Volume 4: Appendices.

Table A19: List of documents that form the 2020 ES and the document reference numbers

Volume	Document Type	Document Reference Number	Document Name	Document Description (as described on the Havant Planning Portal website)
1	NTS	HTR-ATK-XX-XX-RP-Z-0001	Non-Technical Summary	ENVIRONMENTAL STATEMENT VOL 1 NON-TECHNICAL SUMMARY
2	Main Report	HTR-ATK-ZZ-ZZ-RP-Z-0101	Chapters 1-6	ES VOL 2 CHAPTERS 1-6 INC ES CONTENTS
		HTR-ATK-ZZ-ZZ-RP-Z-0107	Chapter 7 Air Quality	ES VOL 2 CHAPTER 7 AIR QUALITY
		HTR-ATK-ZZ-ZZ-RP-Z-0108	Chapter 8 Historic Environment	ES VOL 2 CHAPTER 8 HISTORIC ENVIRONMENT
		HTR-ATK-ZZ-ZZ-RP-Z-0109	Chapter 9 Biodiversity	ES VOL 2 CHAPTER 9 BIODIVERSITY
		HTR-ATK-ZZ-ZZ-RP-Z-0110	Chapter 10 Ground Conditions	ES VOL 2 CHAPTER 10 GROUND CONDITIONS
		HTR-ATK-ZZ-ZZ-RP-Z-0111	Chapter 11 Landscape and Visual	ES VOL 2 CHAPTER 11 LANDSCAPE AND VISUAL
		HTR-ATK-ZZ-ZZ-RP-Z-0112	Chapter 12 Noise and Vibration	ES VOL 2 CHAPTER 12 NOISE AND VIBRATION
		HTR-ATK-ZZ-ZZ-RP-Z-0113	Chapter 13 Traffic and Transport	ES VOL 2 CHAPTER 13 TRAFFIC AND TRANSPORT
		HTR-ATK-ZZ-ZZ-RP-Z-0114	Chapter 14 Material Resources and Waste	ES VOL 2 CHAPTER 14 MATERIAL RESOURCES AND WASTE
		HTR-ATK-ZZ-ZZ-RP-Z-0115	Chapter 15 Water	ES VOL 2 CHAPTER 15 WATER
		HTR-ATK-ZZ-ZZ-RP-Z-0116	Chapter 16 Effect on Climate	ES VOL 2 CHAPTER 16 EFFECT ON CLIMATE

Project related

Volume	Document Type	Document Reference Number	Document Name	Document Description (as described on the Havant Planning Portal website)
		HTR-ATK-ZZ-ZZ-RP-Z-0117	Chapter 17 Vulnerability to Climate Change	ES VOL 2 CHAPTER 17 VULNERABILITY TO CLIMATE CHANGE
		HTR-ATK-ZZ-ZZ-RP-Z-0118	Chapter 18 Population and Human Health	ES VOL 2 CHAPTER 18 POPULATION AND HUMAN HEALTH
		HTR-ATK-ZZ-ZZ-RP-Z-0119	Chapter 19 Cumulative Effects	ES VOL 2 CHAPTER 19 CUMULATIVE EFFECTS
		HTR-ATK-ZZ-ZZ-RP-Z-0120	Chapter 20 Vulnerability to Major Accidents and Disasters	ES VOL 2 CHAPTER 20 VULNERABILITY TO MAJOR ACCIDENTS AND DISASTERS
		HTR-ATK-ZZ-ZZ-RP-Z-0121	Chapter 21 and 22 Conclusion and Glossary	ES VOL 2 CHAPTER 21 CONCLUSION AND 22 GLOSSARY
3	Figures	APP_20_00990-ES_VOL_3_CHAPTERS_1-2_INTRO_AND_DESCRIPTION_OF_DEVELOPMENT_FIGURES	Chapters 1 and 2 Introduction and Description of Development Figures	ES VOL 3 CHAPTERS 1-2 INTRO AND DESCRIPTION OF DEVELOPMENT FIGURES
		APP_20_00990-ES_VOL_3_CHAPTER_7_AIR_QUALITY_FIGURES	Chapter 7 Air Quality Figures	ES VOL 3 CHAPTER 7 AIR QUALITY FIGURES
		APP_20_00990-ES_VOL_3_CHAPTER_8_HISTORIC_ENVIRONMENT_FIGURES	Chapter 8 Historic Environment Figures	ES VOL 3 CHAPTER 8 HISTORIC ENVIRONMENT FIGURES
		APP_20_00990-ES_VOL_3_CHAPTER_9_BIODIVERSITY_FIGURES	Chapter 9 Biodiversity Figures	ES VOL 3 CHAPTER 9 BIODIVERSITY FIGURES
		APP_20_00990-ES_VOL_3_CHAPTER_11_LANDSCAPE_AND_VISUAL	Chapter 11 Landscape and Visual Figures	ES VOL 3 CHAPTER 11 LANDSCAPE AND VISUAL (4 separate documents)

Volume	Document Type	Document Reference Number	Document Name	Document Description (as described on the Havant Planning Portal website)
		APP_20_00990-ES_VOL_3_CHAPTER_12_NOISE_AND_VIBRATION	Chapter 12 Noise and Vibration Figures	ES VOL 3 CHAPTER 12 NOISE AND VIBRATION
		APP_20_00990-ES_VOL_3_CHAPTER_15_WATER_FIGURES	Chapter 15 Water Figures	ES VOL 3 CHAPTER 15 WATER FIGURES
		APP_20_00990-ES_VOL_3_CHAPTER_19_CUMULATIVE_EFFECTS_FIGURES	Chapter 19 Cumulative Effects Figures	ES VOL 3 CHAPTER 19 CUMULATIVE EFFECTS FIGURES
4	Appendix A2 Description of Development	HTR-ATK-XX-XX-RP-Z-0069	A2.1 Outline Environmental Management Plan OEMP (including Record of Environmental Actions and Commitments (REAC))	ES VOL 4 APPX A2 DESCRIPTION OF DEVELOPMENT
	Appendix A4 Alternatives Considered	APP_20_00990-ES_VOL_4_APPX_A4_ALTERNATIVES_CONSIDERED	A4.1 Site Alternatives Assessment	ES VOL 4 APPX A4 ALTERNATIVES CONSIDERED
	Appendix A7 Air Quality	HTR-ATK-ZZ-ZZ-RP-Z-0132	A7.1 Receptors	ES VOL 4 APPX A7 AIR QUALITY
		HTR-ATK-ZZ-ZZ-RP-Z-0132	A7.2 Verification	
	Appendix A8 Historic Environment	HTR-ATK-XX-XX-RP-Z-0034	A8.1 Statement of Heritage Significance	ES VOL 4 APPX A8 HISTORIC ENVIRONMENT
		HTR-ATK-XX-XX-RP-Z-0033	A8.2 Heritage Desk-Based Study	
		HTR-ATK-ZZ-ZZ-RP-Z-0133	A8.3 Gazetteer of Heritage Assets (designated and non-designated)	
		HTR-ATK-ZZ-ZZ-RP-Z-0133	A8.4 Interpretation of Aerial Photographs for Archaeology	

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Volume	Document Type	Document Reference Number	Document Name	Document Description (as described on the Havant Planning Portal website)
		HTR-ATK-ZZ-ZZ-RP-Z-0133	A8.5 Impact Assessment for Heritage Assets (designated and non-designated)	
	Appendix A9 Biodiversity	HTR-ATK-ZZ-ZZ-RP-Z-0146	A9.1 Desk Study	ES VOL 4 APPX A9.1 DESK STUDY
		HTR-ATK-ZZ-ZZ-RP-Z-0146	A9.1A Statutory Designated Sites	ES VOL 4 APPX A9.1A STATUTORY DESIGNATED SITES
		HTR-ATK-ZZ-ZZ-RP-Z-0146	A9.1B Non-Statutory Designations within 2km of the Pipeline	ES VOL 4 APPX A9.1B NON-STATUTORY DESIGNATIONS
		HTR-ATK-ZZ-ZZ-RP-Z-0146	A9.1B Non-Statutory Designations within 2km of the Reservoir	ES VOL 4 APPX A9.1B NON-STATUTORY DESIGNATIONS
		HTR-ATK-ZZ-ZZ-RP-Z-0146	A9.1C Irreplaceable Habitats within 2km of the Scheme	ES VOL 4 APPX A9.1C IRREPLACEABLE HABITATS
		HTR-ATK-ZZ-ZZ-RP-Z-0146	A9.1D Ancient Woodland Report	ES VOL 4 APPX A9.1D ANCIENT WOODLAND REPORT
		HTR-ATK-ZZ-ZZ-RP-Z-0146	A9.1E Natural England Response to Ancient Woodland Report	ES VOL 4 APPX A9.1E NATURAL ENGLAND RESPONSE TO ANCIENT WOODLAND REPORT
		HTR-ATK-ZZ-ZZ-RP-Z-0146	A9.1F Veteran and Notable Trees within 50m of the Scheme	ES VOL 4 APPX A9.1F VETERAN AND NOTABLE TREES
		HTR-ATK-ZZ-ZZ-RP-Z-0146	A9.1G Priority Habitat within 1km of the Scheme	ES VOL 4 APPX A9.1G PRIORITY HABITAT
		HTR-ATK-ZZ-ZZ-RP-Z-0146	A9.1H Ponds within 500m of the Scheme	ES VOL 4 APPX A9.1H PONDS WITHIN 500M

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Volume	Document Type	Document Reference Number	Document Name	Document Description (as described on the Havant Planning Portal website)
		HTR-ATK-ZZ-ZZ-RP-Z-0146	A9.1I Bat Species records within 3km of the Reservoir Site	ES VOL 4 APPX A9.1I BATS SPECIES
		HTR-ATK-ZZ-ZZ-RP-Z-0146	A9.1I Bat Species records within 3km of the Pipeline Corridor	ES VOL 4 APPX A9.1I BATS SPECIES
		HTR-ATK-ZZ-ZZ-RP-Z-0146	A9.1J Bat Roost Records within 5km of the Reservoir Site	ES VOL 4 APPX A9.1J BAT ROOST RECORDS WITHIN 5KM
		HTR-ATK-ZZ-ZZ-RP-Z-0146	A9.1J Bat Roost Records within 5km of the Pipeline Corridor	ES VOL 4 APPX A9.1J BAT ROOST RECORDS WITHIN 5KM
		HTR-ATK-ZZ-ZZ-RP-Z-0146	A9.1K Bechstein's Bat and Barbastelle Records within 10km of the Site	ES VOL 4 APPX A9.1K BECHSTEIN'S BAT AND BARBASTELLE RECORDS
		HTR-ATK-ZZ-ZZ-RP-Z-0146	A9.1L European Protected Species Mitigation License (EPSM) for Bats within 2km of the Site	ES VOL 4 APPX A9.1L EPSM LICENSE FOR BATS
		HTR-ATK-ZZ-ZZ-RP-Z-0146	A9.1M Hazel Dormouse Records and European Protected Species Mitigation License (EPSM) for Hazel Dormouse within 2km of the Scheme	ES VOL 4 APPX A9.1M HAZEL DORMOUSE RECORDS
		HTR-ATK-ZZ-ZZ-RP-Z-0146	A9.1N Water Vole Records within 2km of the Scheme	ES VOL 4 APPX A9.1N WATER VOLE RECORDS
		HTR-ATK-ZZ-ZZ-RP-Z-0146	A9.1O Confidential Badger Records Within 2km of the Scheme	Confidential Appendix – Not in the public domain
		HTR-ATK-ZZ-ZZ-RP-Z-0146	A9.1P Bird Records within 2km of the Reservoir	ES VOL 4 APPX A9.1P BIRD RECORDS

Project related

Volume	Document Type	Document Reference Number	Document Name	Document Description (as described on the Havant Planning Portal website)
		HTR-ATK-ZZ-ZZ-RP-Z-0146	A9.1P Protected Bird Records within 2km of the Pipeline Corridor	ES VOL 4 APPX A9.1P BIRD RECORDS
		HTR-ATK-ZZ-ZZ-RP-Z-0146	A9.1Q Common Reptile Records within 2km of the Scheme	ES VOL 4 APPX A9.1Q COMMON REPTILE RECORDS
		HTR-ATK-ZZ-ZZ-RP-Z-0146	A9.1R Great Crested Newt Records and European Protected Species Mitigation License (EPSM) for GCN within 2km of the Scheme	ES VOL 4 APPX A9.1R GREAT CRESTED NEWTS
		HTR-ATK-ZZ-ZZ-RP-Z-0146	A9.1S Terrestrial Invertebrate Records within 2km of the Reservoir Site	ES VOL 4 APPX A9.1S TERRESTRIAL INVERTEBRATE RECORDS
		HTR-ATK-ZZ-ZZ-RP-Z-0146	A9.1S Terrestrial Invertebrate records within 2km of the Pipeline Corridor	ES VOL 4 APPX A9.1S TERRESTRIAL INVERTEBRATE RECORDS
		HTR-ATK-ZZ-ZZ-RP-Z-0146	A9.1T Protected Priority and Notable plants within 2km of the Reservoir Site	ES VOL 4 APPX A9.1T PROTECTED PRIORITY PLANTS WITHIN 2KM
		HTR-ATK-ZZ-ZZ-RP-Z-0146	A9.1T Protected Priority and Notable plants within 2km of the Pipeline Corridor	ES VOL 4 APPX A9.1T PROTECTED PRIORITY PLANTS WITHIN 2KM
		HTR-ATK-ZZ-ZZ-RP-Z-0146	A9.1U Other protected and notable species within 2km of the Site	ES VOL 4 APPX A9.1U OTHER PROTECTED SPECIES WITHIN 2KM OF THE SITE
		HTR-ATK-ZZ-ZZ-RP-Z-0146	A9.1V Legislation Table	Not available on Havant Borough Council website
		HTR-ATK-ZZ-ZZ-RP-Z-0146	A9.1W HBIC Legislation and notable species status	ES VOL 4 APPX A9.1W HBIC LEGISLATION AND NOTABLE SPECIES STATUS

Project related

Volume	Document Type	Document Reference Number	Document Name	Document Description (as described on the Havant Planning Portal website)
		APP_20_00990-ES_VOL_4_APPX_A9.2_VEGETATION_SURVEY_REPORT	A9.2 Vegetation Survey Report	ES VOL 4 APPX A9.2 VEGETATION SURVEY REPORT
		HTR-ATK-ZZ-ZZ-RP-Z-0147	A9.3 Aquatic Ecology	ES VOL 4 APPX A9.3 AQUATIC ECOLOGY
		APP_20_00990-ES_VOL_4_APPX_A9.4_BAT_SURVEY_REPOERT	A9.4 Bat Survey Report	ES VOL 4 APPX A9.4 BAT SURVEY REPOERT
		APP_20_00990-ES_VOL_4_APPX_A9.5_HAZEL_DORMOUSE_SURVEY_REPORT	A9.5 Hazel Dormouse Survey Report	ES VOL 4 APPX A9.5 HAZEL DORMOUSE SURVEY REPORT
		APP_20_00990-ES_VOL_4_APPX_A9.6_OTTER_SURVEY_REPORT	A9.6 Otter Survey Report	ES VOL 4 APPX A9.6 OTTER SURVEY REPORT
		APP_20_00990-ES_VOL_4_APPX_A9.7_WATER_VOLE_SURVEY_REPORT	A9.7 Water Vole Survey Report	ES VOL 4 APPX A9.7 WATER VOLE SURVEY REPORT
		N/A	A9.8 Badger Survey Report	Confidential appendix – not in the public domain
		APP_20_00990-ES_VOL_4_APPX_A9.9_BIRD_SURVEY_REPORT	A9.9 Bird Survey Report	ES VOL 4 APPX A9.9 BIRD SURVEY REPORT
		APP_20_00990-ES_VOL_4_APPX_A9.10_REPTILE_SURVEY_REPORT	A9.10 Reptile Survey Report	ES VOL 4 APPX A9.10 REPTILE SURVEY REPORT
		APP_20_00990-ES_VOL_4_APPX_A9.11_GREAT_CRESTED_NEWT_SURVEY_REPORT	A9.11 Great Crested Newt Survey Report	ES VOL 4 APPX A9.11 GREAT CRESTED NEWT SURVEY REPORT
		APP_20_00990-ES_VOL_4_APPX_A9.11_GREAT_CRESTED_NEWT_SURVEY_REPORT	A9.12 Invertebrates Survey Report	ES VOL 4 APPX A9.12 INVERTEBRATES SURVEY REPORT

Project related

Volume	Document Type	Document Reference Number	Document Name	Document Description (as described on the Havant Planning Portal website)
		ECOSA number PEA-090718-12 APP_20_00990- ES_VOL_4_APPX_A9.13_PIPELI NE_PRELIMINARY_ECOLOGICA L_APPRAISAL	A9.13 Pipeline Preliminary Ecological Appraisal	ES VOL 4 APPX A9.13 PIPELINE PRELIMINARY ECOLOGICAL APPRAISAL
		HTR-ATK-ZZ-ZZ-RP-L-0001	A9.14 Arboricultural Impact Assessment	ES VOL 4 APPX A9.14 ARBORICULTURAL IMPACT ASSESSMENT AIA
		HTR-ATK-XX-XX-RP-Z-0035	A9.15 Habitats Regulation Assessment Stage 1 Screening Report to Inform Stage 1 Screening and Stage 2 Appropriate Assessment	ES VOL 4 APPX A9.15 HABITATS REGULATION ASSESSMENT HRA
		HTR-ATK-XX-XX-RP-Z-0035	A9.15A Site Location and Pipeline Route Location Plans	
		HTR-ATK-XX-XX-RP-Z-0035	A9.15A.1 Site Location Plan	
		HTR-ATK-XX-XX-RP-Z-0035	A9.15A.2 Pipeline Route Sections Plan	
		HTR-ATK-XX-XX-RP-Z-0035	A9.15A.3 EA Abstraction Licence	
		HTR-ATK-XX-XX-RP-Z-0035	A9.15B Statutory Designated Sites within 2 km of the Scheme	
		HTR-ATK-XX-XX-RP-Z-0035	A9.15B.1 Hydrologically Connected Statutory Designated Sites	
		HTR-ATK-XX-XX-RP-Z-0035	A9.15B.2 Functionally Connected Statutory Designated Sites	

Volume	Document Type	Document Reference Number	Document Name	Document Description (as described on the Havant Planning Portal website)
		HTR-ATK-XX-XX-RP-Z-0035	A9.15B.3 The Solent and Dorset Marine Special Protected Area (SPA) Natural England Boundary Map	
		HTR-ATK-XX-XX-RP-Z-0035	A9.15C Statutory Designated Sites Criteria	
		HTR-ATK-XX-XX-RP-Z-0035	A9.15C.1 Chichester and Langstone Harbours SPA Site	
		HTR-ATK-XX-XX-RP-Z-0035	A9.15C.2 Chichester and Langstone Harbours Ramsar Site	
		HTR-ATK-XX-XX-RP-Z-0035	A9.15C.3 Solent Maritime SAC	
		HTR-ATK-XX-XX-RP-Z-0035	A9.15C.4.1 Sussex bat SACs – Singleton and Cocking Tunnels SAC	
		HTR-ATK-XX-XX-RP-Z-0035	A9.15C.4.2 Sussex bat SACs – Ebernoe Common SAC	
		HTR-ATK-XX-XX-RP-Z-0035	A9.15D Plan of Committed Developments	
	Appendix A10 Ground Conditions	HTR-ATK-ZZ-ZZ-RP-Z-0135	A10.1 Definitions of Probability and Consequence	ES VOL 4 APPX A10.1 DEFINITIONS OF PROBABILITY AND CONSEQUENCE
		HTR-ATK-ZZ-ZZ-RP-C-0001	A10.2 Havant Thicket Winter Storage Reservoir, Desk Study Report	ES VOL 4 APPX A10.2 DESK STUDY APPX F
		APP_20_00990-ES_VOL_4_APPX_A10.3_PIPEL INE_ENVIROCHECK	A10.3 Havant Thicket to Bedhampton Pipeline Envirocheck Report	ES VOL 4 APPX A10.3 PIPELINE ENVIROCHECK
		APP_20_00990-ES_VOL_4_APPX_A10.4_UNEXP LODED_ORDNANCE_RISK_MAP S	A10.4 Unexploded Ordnance Risk Maps	ES VOL 4 APPX A10.4 UNEXPLODED ORDNANCE RISK MAPS

Project related

Volume	Document Type	Document Reference Number	Document Name	Document Description (as described on the Havant Planning Portal website)
		HTR-ATK-RZ-RE-RP-C-0001	A10.5 Havant Thicket Winter Storage Reservoir, Ground Investigation Report	Contained as 20 separate reports
		HTR-ATK-ZZ-ZZ-RP-Z-0154	A10.6 Preliminary Conceptual Site Model Tables	ES VOL 4 APPX A10.6 PRELIMINARY CONCEPTUAL SITE MODEL TABLES
		HTR-ATK-ZZ-ZZ-RP-Z-0155	A10.7 Impact Assessment Tables	ES VOL 4 APPX A10.7 IMPACT ASSESSMENT TABLES
	Appendix A11 Landscape and Visual	HTR-ATK-ZZ-ZZ-RP-Z-0136	A11.1 Assessment Methodology	ES VOL 4 APPX A11 LANDSCAPE AND VISUAL
		HTR-ATK-ZZ-ZZ-RP-Z-0136	A11.2 Landscape & Visual Impact Assessment Glossary of Terms	
		HTR-ATK-ZZ-ZZ-RP-Z-0136	A11.3 Schedule of Relevant Planning Policy	
		HTR-ATK-ZZ-ZZ-RP-Z-0136	A11.4 Schedule of Likely Landscape Effects	
		HTR-ATK-ZZ-ZZ-RP-Z-0136	A11.5 Schedule of Likely Visual Effects	
		HTR-ATK-ZZ-ZZ-RP-Z-0136	A11.6 Schedule of Likely Cumulative Effects	
		HTR-ATK-ZZ-ZZ-RP-Z-0136	A11.7 Map of Rowlands Castle Local Landscape Character Areas	
	Appendix 12 Noise and Vibration	HTR-ATK-ZZ-ZZ-RP-Z-0137	A12.1 Reservoir construction plant list	ES VOL 4 APPX A12 NOISE AND VIBRATION
		HTR-ATK-ZZ-ZZ-RP-Z-0137	A12.2 Noise modelling construction schedule	
		HTR-ATK-ZZ-ZZ-RP-Z-0137	A12.3 Reservoir noise modelling results	

Project related

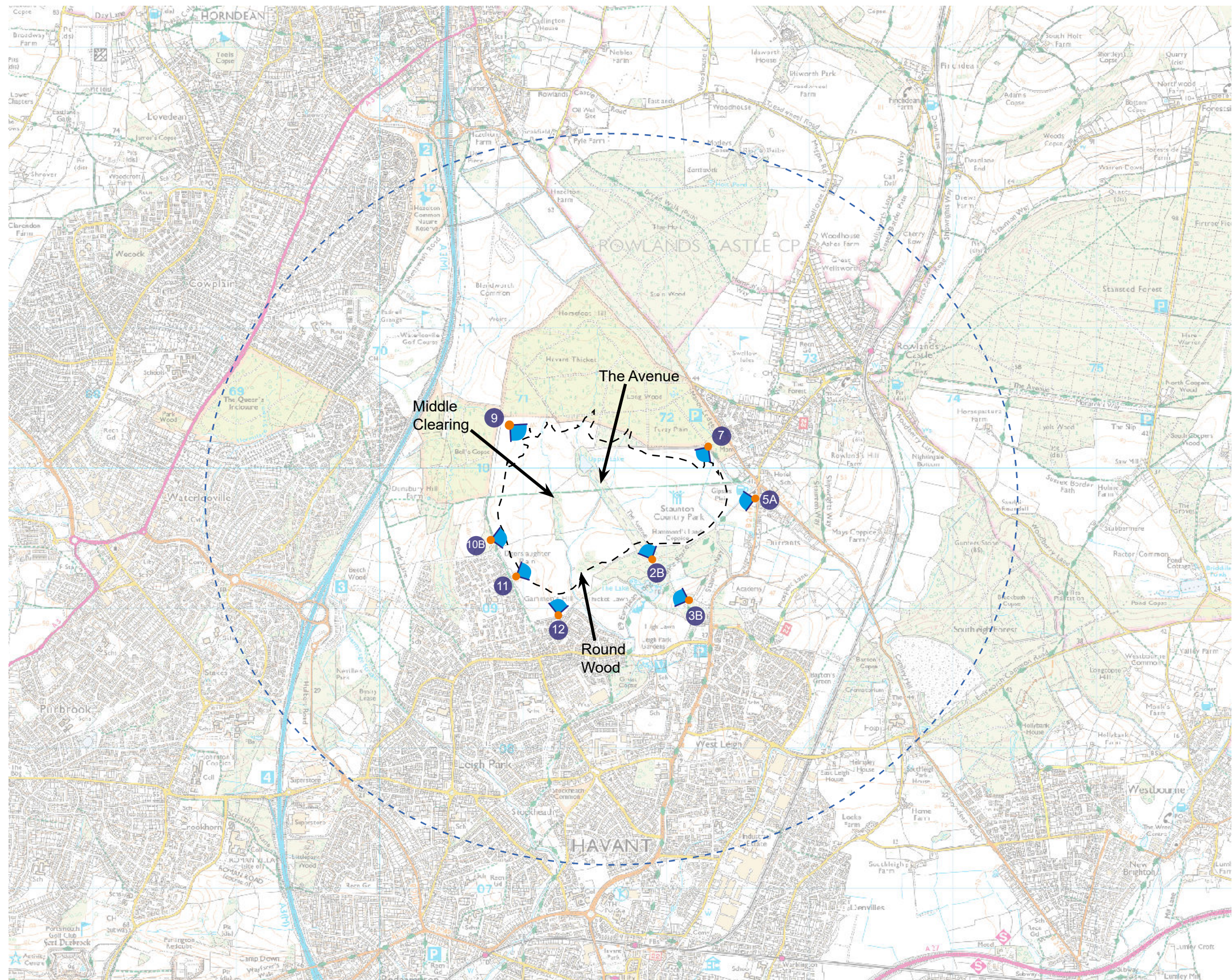
Volume	Document Type	Document Reference Number	Document Name	Document Description (as described on the Havant Planning Portal website)
		HTR-ATK-ZZ-ZZ-RP-Z-0137	A12.4 Pipeline route construction plant list	
		HTR-ATK-ZZ-ZZ-RP-Z-0137	A12.5 Pipeline route daytime construction noise calculations	
		HTR-ATK-ZZ-ZZ-RP-Z-0137	A12.6 Pipeline route night time construction noise calculations	
		HTR-ATK-ZZ-ZZ-RP-Z-0137	A12.7 Road traffic noise assessment	
	Appendix A13 Traffic and Transport	HTR-ATK-XX-XX-RP-Z-0043	A13.1 Transport Assessment	ES VOL 4 APPX A13 TRAFFIC AND TRANSPORT
		HTR-ATK-XX-XX-RP-Z-0043	A13.1A Havant Thicket Reservoir: visitor number, and recreational and amenity facilities review	
		HTR-ATK-XX-XX-RP-Z-0043	A13.1B Scoping information	
		HTR-ATK-XX-XX-RP-Z-0021	A13.1C Technical Note Access Route - Options Appraisal at Havant Thicket	
		HTR-ATK-XX-XX-RP-Z-0043	A13.1D Stage One Road Safety Audit (RSA)	
		HTR-ATK-XX-XX-RP-Z-0043	A13.1E Flow Diagrams	
		HTR-ATK-XX-XX-RP-Z-0043	A13.1F Junctions 9 Output	
	Appendix A14 Material Resources and Waste	HTR-ATK-ZZ-ZZ-RP-Z-0139	A14.1 Materials Management Strategy	ES VOL 4 APPX A14 MATERIAL RESOURCES AND WASTE

Project related

Volume	Document Type	Document Reference Number	Document Name	Document Description (as described on the Havant Planning Portal website)
	Appendix A15 Water	HTR-ATK-ZZ-ZZ-RP-Z-0123	A15.1 Water Framework Directive	ES VOL 4 APPX A15.1 WATER FRAMEWORK DIRECTIVE WFD
		HTR-ATK-XX-XX-RP-Z-0042	A15.2 Flood Risk Assessment	ES VOL 4 APPX A15.2 FRA APPX A
		APP_20_00990- ES_VOL_4_APPX_A15.2_FRA_A PPX_A	A15.2A Mapping	ES VOL 4 APPX A15.2 FLOOD RISK ASSESSMENT FRA
		HTR-ATK-ZZ-ZZ-RP-Z-0151	A15.2B Hydraulic Modelling Report	
		197_08_SD01	A15.2C Hydrology - FEH Proforma	
		HTR-ATK-ZZ-ZZ-RP-Z-0153	A15.2D Tidal Boundary Generation	
		HTR-ATK-RZ-RE-RP-Z-0008	A15.3 Water Quality Modelling Report	ES VOL 4 APPX A15.3 WATER QUALITY MODELLING REPORT
		HTR-ATK-XX-XX-RP-Z-0070	A15.4 Biodiversity Net Gain for Rivers	ES VOL 4 APPX A15.4 BIODIVERSITY NET GAIN FOR RIVERS
	Appendix A16 Effect on Climate	HTR-ATK-ZZ-ZZ-RP-Z-0141	A16.1 Carbon Model	ES VOL 4 APPX A16 EFFECTS ON CLIMATE
	Appendix A18 Population and Human Health	HTR-ATK-ZZ-ZZ-RP-Z-0143	A18.1 Planning and Health Policies	ES VOL 4 APPX A18 POPULATION AND HUMAN HEALTH
		HTR-ATK-ZZ-ZZ-RP-Z-0143	A18.2 Visitor Survey August 2018 V4	
		HTR-ATK-ZZ-ZZ-RP-Z-0143	A18.3 Visitor number and recreational amenity facilities review (Summary paper) July 2019	

Volume	Document Type	Document Reference Number	Document Name	Document Description (as described on the Havant Planning Portal website)
	Appendix A19 Cumulative and In-Combination Effects	HTR-ATK-ZZ-ZZ-RP-Z-0144	A19.1 List of Committed Developments	ES VOL 4 APPX A19 CUMULATIVE AND IN COMBINATION EFFECTS

Appendix B – Havant Thicket Photo Visualisation Sheets



KEY

- 1 Location of Photo Visualisation Viewpoint
- Reservoir Footprint
- 2 km Study Area

Notes:

Service Layer Credits:

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Site visits conducted in October 2019 and March 2020.

All photographs taken using a Nikon digital SLR camera with a 35 mm Fixed Focal length lens.

Camera mounted on a tripod. Viewer height above ground level; approximately 1.6 m.

All images subsequently merged with brightness/contrast adjusted using computer software.

Print Document on A3 size Format.

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Drawing Suitability: PUBLISHED	Status: A1
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Contractors Drawing Number: HTR - ATK - RZ - RE - DR - L - 0004
Project Originator Volume Location Type Role Number

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Project Ref. No: 5169117	Sheet: 1 of 9	Scale: N.A.	Sheet Size: A3
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Project Title: HAVANT THICKET RESERVOIR
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Drawing Title: FIGURE 11.29 - PHOTO VISUALISATION SHEETS: LOCATION PLAN
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Portsmouth Water Drawing Number:	Rev: C02
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Photo Viewpoint 2B
View looking north west along The Avenue.



Photo Visualisation View of the Scheme at year 1

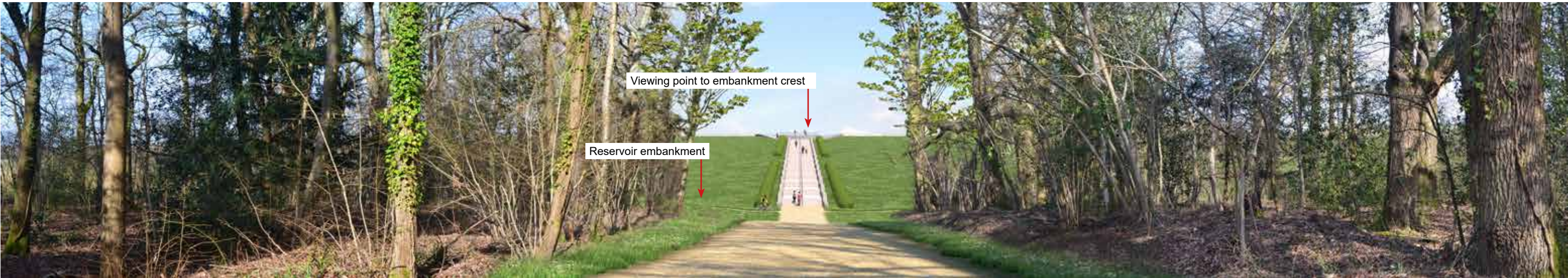
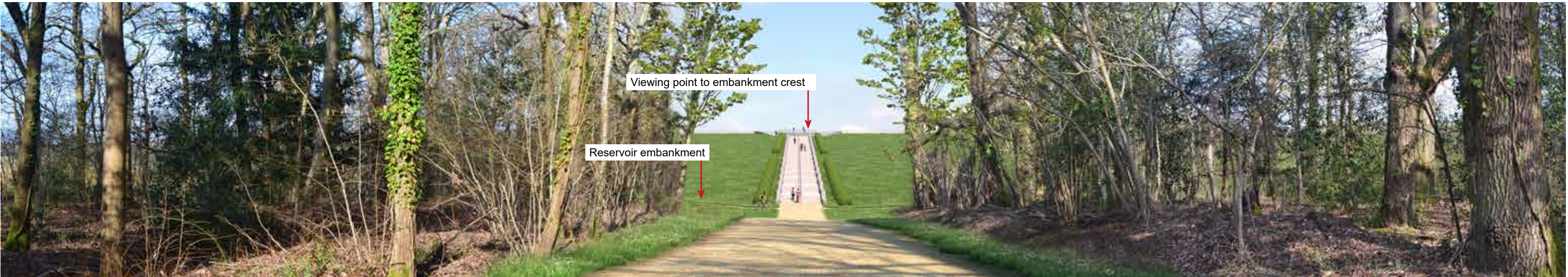


Photo Visualisation View of the Scheme at year 15



Notes //
Site visits conducted in March 2020.
All photographs taken using a Nikon digital SLR camera with a 35 mm Fixed Focal length lens. Camera mounted on a tripod.
Viewer height above ground level; approximately 1.6 m
All images subsequently merged with brightness/ contrast adjusted using computer software.

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Photo Viewpoint 3B
View looking north west towards the site from The Terrace of Staunton Country Park approximately 0.5 km.



Photo Visualisation View of the Scheme at year 1

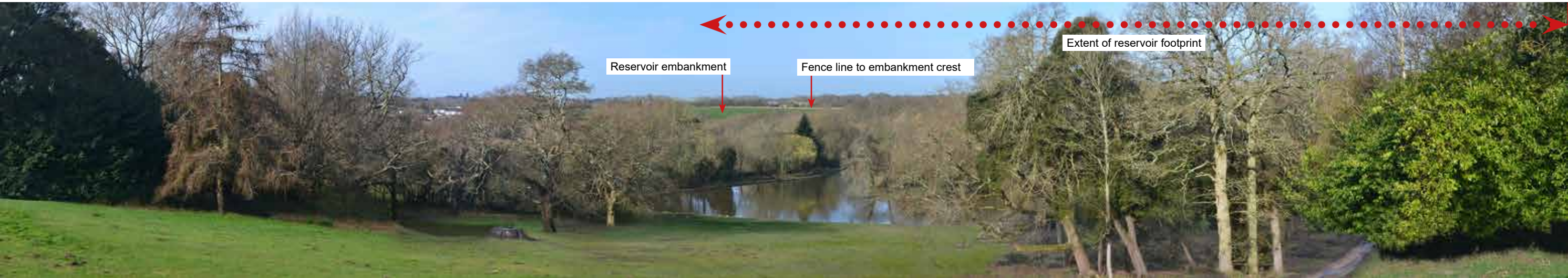
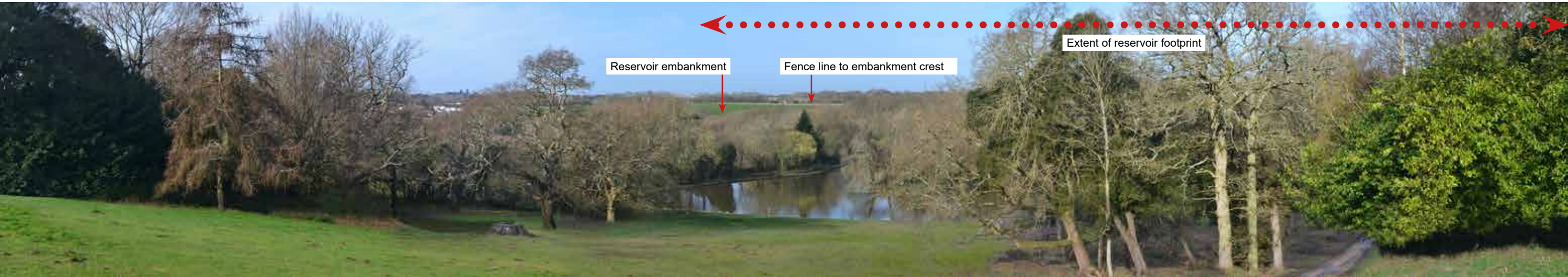


Photo Visualisation View of the Scheme at year 15



Notes //
Site visits conducted in March 2020.
All photographs taken using a Nikon digital SLR camera with a 35 mm Fixed Focal length lens. Camera mounted on a tripod.
Viewer height above ground level; approximately 1.6 m
All images subsequently merged with brightness/ contrast adjusted using computer software.

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Figure 11.31: Photo Visualisation Sheets Sheet 3 of 9

Photo Viewpoint 5A
View from back of houses on Manor Lodge Road looking west/southwest towards site.



Photo Visualisation View of the Scheme at year 1

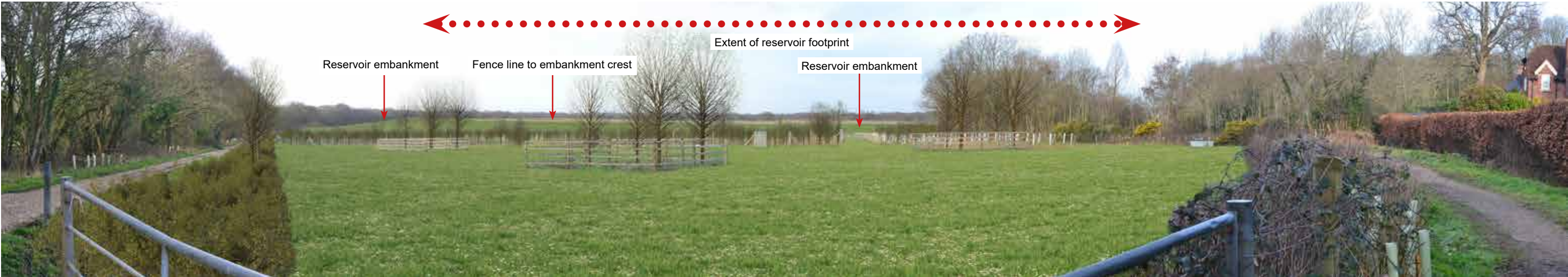
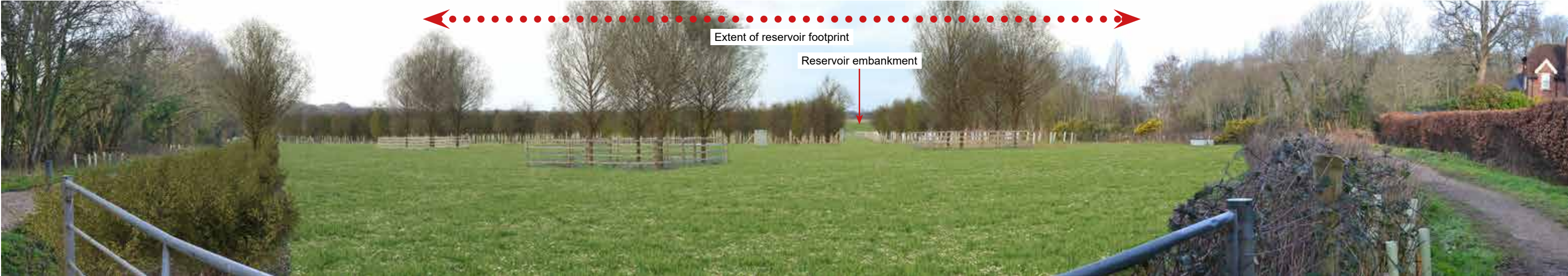


Photo Visualisation View of the Scheme at year 15



Notes //
Site visits conducted in March 2020.
All photographs taken using a Nikon digital SLR camera with a 35 mm Fixed Focal length lens. Camera mounted on a tripod.
Viewer height above ground level; approximately 1.6 m
All images subsequently merged with brightness/ contrast adjusted using computer software.

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Figure 11.32: Photo Visualisation Sheets Sheet 4 of 9

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Photo Viewpoint 7
View from within site looking west to south west towards The Avenue.



Photo Visualisation View of the Scheme at year 1



Photo Visualisation View of the Scheme at year 15



Notes //
Site visits conducted in March 2020.
All photographs taken using a Nikon digital SLR camera with a 35 mm Fixed Focal length lens. Camera mounted on a tripod.
Viewer height above ground level; approximately 1.6 m
All images subsequently merged with brightness/ contrast adjusted using computer software.

Photo Viewpoint 9
View from within site looking north east to south towards The Avenue and Middle Clearing.



Photo Visualisation View of the Scheme at year 1

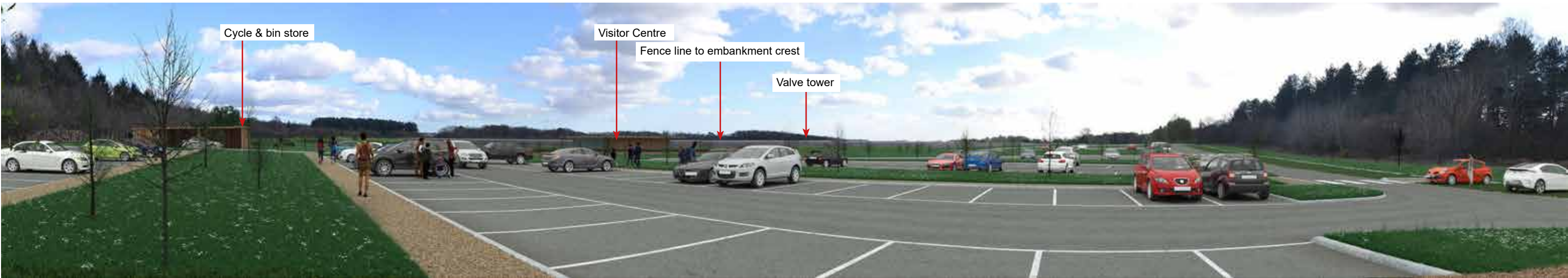
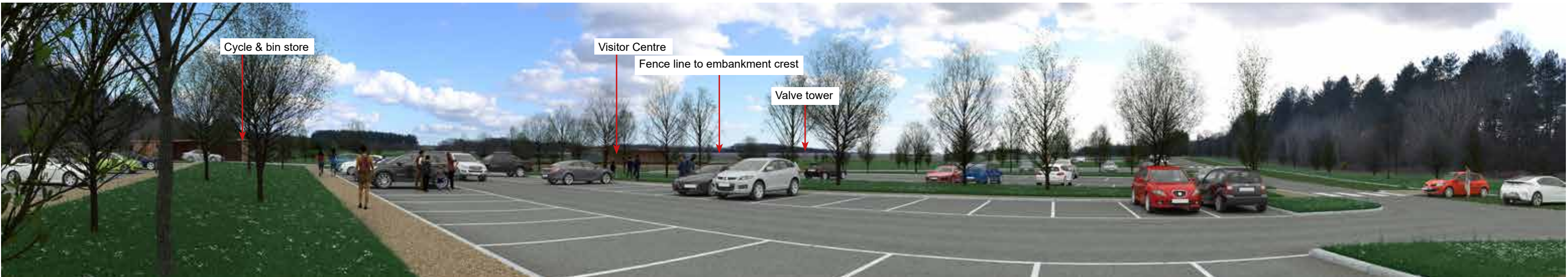


Photo Visualisation View of the Scheme at year 15



Notes //
Site visits conducted in March 2020.
All photographs taken using a Nikon digital SLR camera with a 35 mm Fixed Focal length lens. Camera mounted on a tripod.
Viewer height above ground level; approximately 1.6 m
All images subsequently merged with brightness/ contrast adjusted using computer software.

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Figure 11.34: Photo Visualisation Sheets Sheet 6 of 9

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Photo Viewpoint 10B
View from footpath 121 looking north east to south west towards Middle Clearing and Round Wood.



Photo Visualisation View of the Scheme at year 1

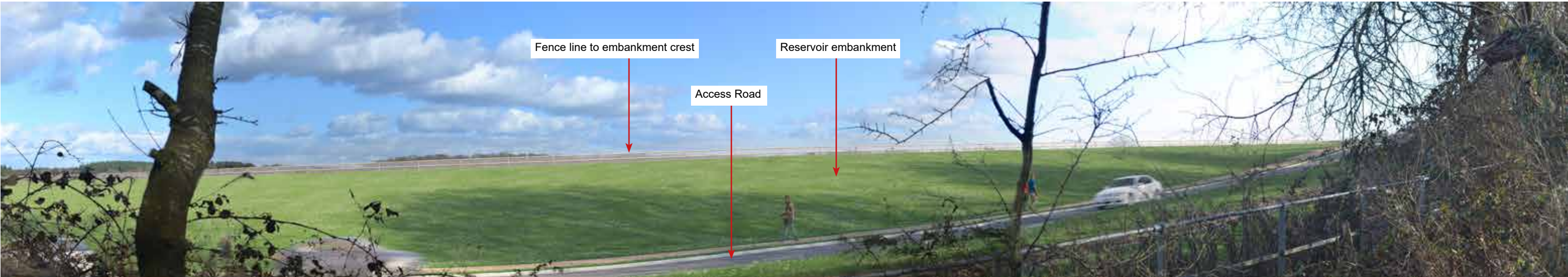
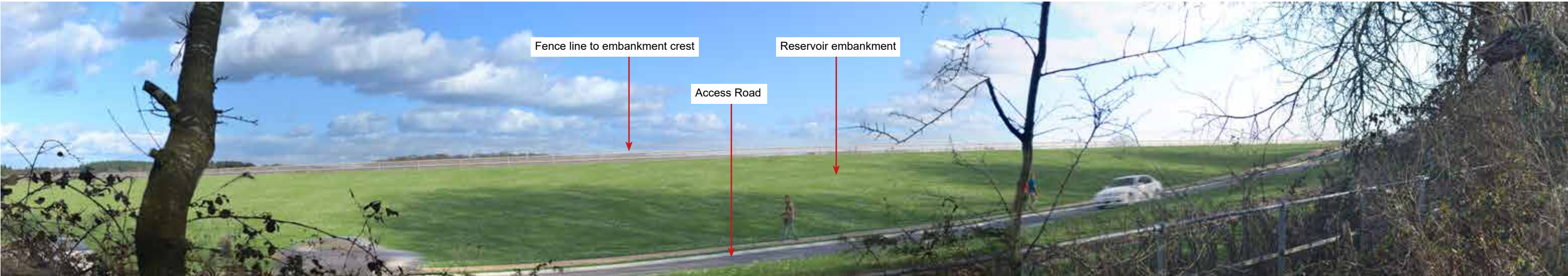


Photo Visualisation View of the Scheme at year 15



Notes //
Site visits conducted in March 2020.
All photographs taken using a Nikon digital SLR camera with a 35 mm Fixed Focal length lens. Camera mounted on a tripod.
Viewer height above ground level; approximately 1.6 m
All images subsequently merged with brightness/ contrast adjusted using computer software.

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Figure 11.35: Photo Visualisation Sheets Sheet 7 of 9

Photo Viewpoint 11
View from within site looking north to south towards Middle Clearing, Round Wood and The Avenue.



Photo Visualisation View of the Scheme at year 1

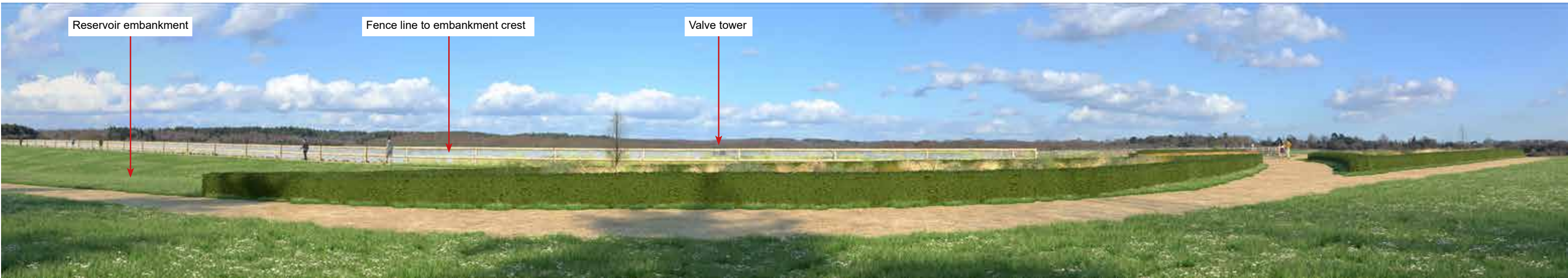
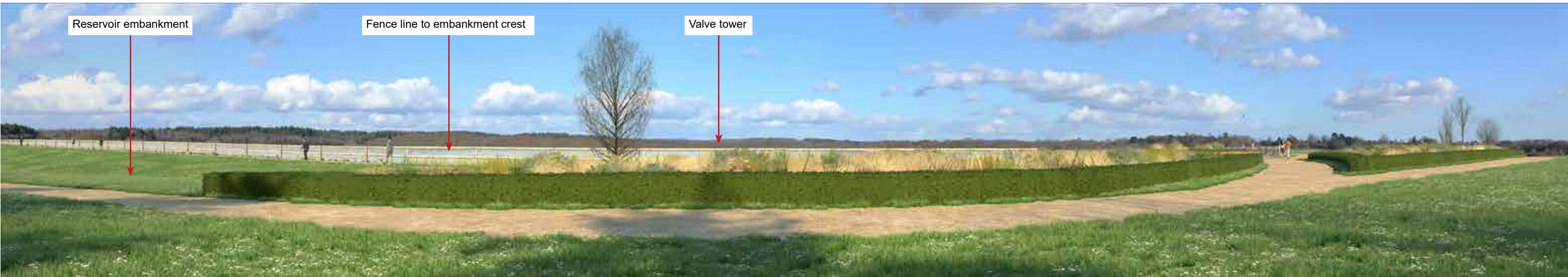


Photo Visualisation View of the Scheme at year 15



Notes //
Site visits conducted in March 2020.
All photographs taken using a Nikon digital SLR camera with a 35 mm Fixed Focal length lens. Camera mounted on a tripod.
Viewer height above ground level; approximately 1.6 m
All images subsequently merged with brightness/ contrast adjusted using computer software.

Photo Viewpoint 12
View from within site looking north to east towards Middle Clearing, Round wood and The Avenue.



Photo Visualisation View of the Scheme at year 1

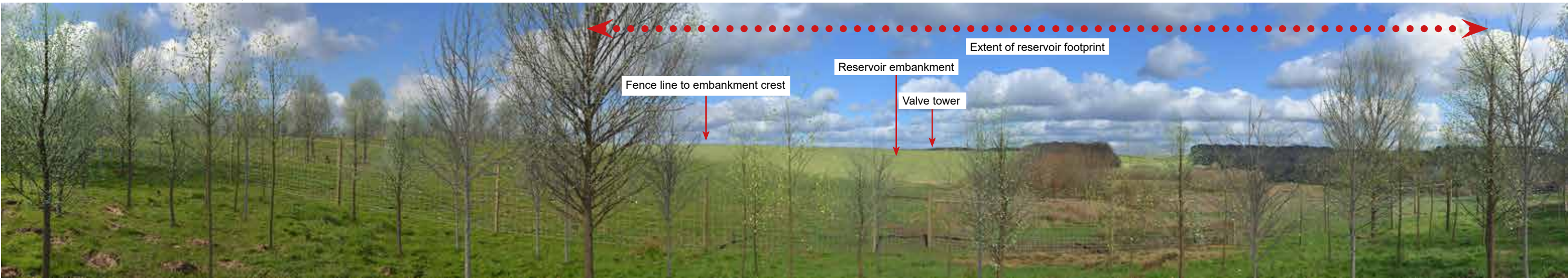


Photo Visualisation View of the Scheme at year 15



Notes //
Site visits conducted in March 2020.
All photographs taken using a Nikon digital SLR camera with a 35 mm Fixed Focal length lens. Camera mounted on a tripod.
Viewer height above ground level; approximately 1.6 m
All images subsequently merged with brightness/ contrast adjusted using computer software.

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Figure 11.37: Photo Visualisation Sheets Sheet 9 of 9