

A30 Chiverton to Carland Cross TR010026

6.2 ENVIRONMENTAL STATEMENT CHAPTER 10 MATERIALS

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APFP Regulation 5(2)(a)
Infrastructure Planning (Applications: Prescribed
Forms and Procedure) Regulations 2009

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**The Infrastructure Planning
(Applications: Prescribed Forms and
Procedure) Regulations 2009**

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**6.2 ENVIRONMENTAL STATEMENT
CHAPTER 10 MATERIALS**

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Table of Contents

	Pages
10 Materials	3
10.1 Introduction	3
10.2 Competent Expert	4
10.3 Legislative and Policy Framework	5
10.4 Study Area	11
10.5 Assessment Methodology	12
10.6 Baseline Conditions	16
10.7 Potential Impacts	22
10.8 Consultation	22
10.9 Assessment Assumptions and Limitations	22
10.10 Design, Mitigation and Enhancement Measures	23
10.11 Assessment of Effects	26
10.12 Monitoring	36
10.13 Summary	37

Table of Tables

Table 10-1 The Waste Hierarchy	5
Table 10-2 Targets for the use and management of material resources	10
Table 10-3 Environmental Value (or Sensitivity)	14
Table 10-4 Magnitude of Impact	14
Table 10-5 Approach to Evaluating Significance of Effect	14
Table 10-6 Significance Criteria for Material Assets and Waste	15
Table 10-7 Receptors with the potential to be impacted by the phases of the scheme	16
Table 10-8 Status of Mineral Groups in Cornwall County (that could be used in construction)	18
Table 10-9 Waste Management Infrastructure Requirements	20
Table 10-10 Indicative capacity of hazardous waste management facilities	21
Table 10-11 Proposed mitigation measures	25
Table 10-12 Material resources required	26
Table 10-13 Estimated waste arisings	27
Table 10-14 Assessment of Strategic Targets	33
Table 10-15 Detailed Assessment Reporting Matrix	36
Table 10-16 Summary of significance of effect	37

Table of Figures Volume 6 Document Ref 6.3

Figure 10.1 Waste Management Infrastructure

Table of Appendices Volume 6 Document Ref 6.4

Appendix 10.1 Suppliers and local quarries/plants

Appendix 10.2 List of sites known to accept CDE waste

10 Materials

10.1 Introduction

- 10.1.1 This chapter provides an assessment of the likely significance of environmental effects from use of material resources and the generation and management of waste resulting from the scheme.
- 10.1.2 It should be noted that effects of the scheme in terms of geology and soils, and the potential for land contamination, have been addressed in **Geology and Soils** (Volume 6 Document Reference 6.2 ES Chapter 9) of this Environmental Statement and the effects on climate change have been addressed in **Climate Change** (Volume 6 Document Reference 6.2 ES Chapter 14).
- 10.1.3 For the purposes of this assessment, this chapter considers the:
- use of material resources; and
 - generation and management of waste.
- 10.1.4 The assessment presented in this chapter focuses mainly on the construction phase of the scheme as this is primarily where potential significant effects of materials and waste are more likely to arise.
- 10.1.5 Operational effects, in terms of resource use and waste generation, have been considered, however the effects are dependent on the long term management and the need to replace materials throughout the scheme lifetime. This has been assessed in Section 10.10 Assessment of Effects.
- 10.1.6 The assessment has been conducted in accordance with the guidance set out in the DMRB Interim Advice Note (IAN) 153/11 “Guidance on the Environmental Assessment of Material Resources”¹. This is considered to provide the most up to date guidance and good practice for the assessment of effects of material resources and waste.
- 10.1.7 It is assumed that the potential exists for environmental effects from the use of materials and generation of waste. Given the scale of the development and the large quantity of materials likely to be required, the Scoping Opinion included agreement on the proposal to undertake a detailed level of assessment with a clear methodology. **Scoping Opinion** (Volume 6 Document Reference 6.4 ES Appendix 4.1).
- 10.1.8 The assessment of environmental effects associated with the use of material resources and the generation and management of waste resulting from the construction and operation of the scheme has taken into account preliminary information made available related to the following:
- Types and quantities of materials and waste associated with the construction of the scheme (based on a preliminary bill of quantities at Design Fix 3);
 - Cut and fill balance (based on earthworks calculations agreed at Design Fix 3);
 - Temporary storage of materials during construction;
 - Movement of materials during construction (both to and from the scheme); and

¹ Interim Advice Note 153/11 Guidance on the Environmental Assessment of Material Resources, 2011
<http://www.standardsforhighways.co.uk/ha/standards/ians/pdfs/ian153.pdf>

- Management of waste streams.

Use of material resources

- 10.1.9 Material resources include both primary raw materials, such as aggregates and minerals, and secondary manufactured products. Many material resources would originate off site and some, such as excavated soils and rock, would arise on site.
- 10.1.10 Road schemes require quantities of both primary raw materials and secondary manufactured products. The production, sourcing, transport, handling, storage and use of these materials, as well as the disposal of any surplus (where necessary), have the potential to adversely affect the environment. The key impacts associated with the use of materials in relation to the scheme are addressed in Section 10.10. The use of materials has the potential to result in direct and indirect impacts on the environment. This includes greenhouse gas emissions associated with the transportation of materials, which has been considered in **Climate Change** (Volume 6 Document Ref 6.2 ES Chapter 14).

Generation and management of waste

- 10.1.11 In considering material resource use and waste management, it is important to define when, under current legislation and understanding, a material is considered to be a waste. The definition of waste is important because the classification of substances as waste is the basis for the formulation of waste management and the application of controls to protect the environment and human health in respect of waste.
- 10.1.12 In respect of this assessment it should be noted that material excavated and reused within the scheme area/planning boundary is not classed as waste, subject to it being suitable for its intended use.
- 10.1.13 The EU Waste Framework Directive (Directive 2008/98/EC)² includes a common definition of 'waste', which is '*any substance or object which the holder discards or intends or is required to discard*', with the term 'discard' including the disposal, recovery or recycling of a substance.
- 10.1.14 Waste for disposal is classed as hazardous, non-hazardous or inert, depending on the level of harm to human health and/or the environment. Once a material has become waste, it remains waste until it has been fully recovered and no longer poses a potential threat to the environment or to human health, at which point it is no longer subject to the controls and measures required by the Directive.
- 10.1.15 The generation of large quantities of waste in road schemes has the potential to impact on available waste management infrastructure through occupying landfill space, limiting short-term use of available waste storage and the potential to impact the scheme's ability to comply with relevant waste policies and plans.

10.2 Competent Expert

- 10.2.1 The Materials lead is a Chartered Geologist who holds a BSc (Hons) degree in Geology from The University of Liverpool (2000) and an MSc in Applied Environmental Geology from Cardiff University (2002). They are a Fellow of the

² European Commission, 2016. Directive 2008/98/EC on Waste (EU Waste Framework Directive)

Geological Society of London. Full details are provided in **Competent expert evidence** (Volume 6 Document Ref 6.4 Appendix 1.1).

10.3 Legislative and Policy Framework

Legislation

Environmental Impact Assessment Directive 2014/52/EU

- 10.3.1 The Environmental Impact Assessment (EIA) Directive 2014/52/EU provides the overarching legislative framework for undertaking environmental impact assessments for public and private projects.
- 10.3.2 Article 3 of the EIA Directive requires the EIA to identify, describe and assess in an appropriate manner the direct and indirect significant effects of a project on a number of factors including material assets (in light of each individual case).

EU Waste Framework Directive 2008/98/EC

- 10.3.3 The EU Waste Framework Directive 2008/98/EC provides the overarching legislative framework for the collection, transport, recovery and disposal of waste, and includes a common definition of waste, as provided in paragraph 10.1.13. It sets out measures to protect the environment and human health by preventing or reducing the adverse effects of the generation and management of waste, and by improving the efficiency of resource use, and reducing the overall impact.
- 10.3.4 The Directive also mandates the Waste Hierarchy³ (Table 10-1) which requires that where waste is unavoidable, products and materials should, subject to regulatory controls, be used again, for the same or a different purpose (re-use). Otherwise, resources should be recovered from waste through recycling. Value can also be recovered by generating energy from waste but only if none of the above offer an appropriate alternative solution.

Table 10-1 The Waste Hierarchy

Stages	Includes
Prevention	Using less material in design and manufacture. Keeping products for longer; re use. Using less hazardous material.
Preparing for re-use	Checking, cleaning, repairing, refurbishing, whole items or spare parts.
Recycling	Turning waste into a new substance or product. Includes composting if it meets quality protocols.
Other recovery	Includes anaerobic digestion, incineration with energy recovery, gasification and pyrolysis which produce energy (fuels, heat and power) and materials from waste; some backfilling operations.
Disposal	Landfill and incineration without energy recovery.

³ Department for Environment Food and Rural Affairs. (2013). *Waste Management Plan for England Post Adoption Statement*. December 2013. Accessed on 12 October 2014 from https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/265543/pb14101-wastemanage-post-adopt-20131212.pdf

The Waste (England and Wales) (Amendment) Regulations 2014

- 10.3.5 Directive 2008/98/EC has now been transposed in England by the Waste (England and Wales) Regulations 2011 (S.I. 2011 No. 988) (as amended)⁴.
- 10.3.6 In addition to the above, the following legislation relating to material resources and waste management will also be taken into account:
- a. The Controlled Waste (England and Wales) Regulations 2012.
 - b. The Hazardous Waste (England and Wales) Regulations 2005.

EU Landfill Directive 1999/31/EC

- 10.3.7 The EU Landfill Directive 1999/31/EC⁵ sets stringent requirements for the landfilling of wastes. The Directive aims to prevent or reduce negative effects on the environment from the landfilling of waste, as far as is practicably possible, and introduces stringent technical requirements for waste and landfills as a disposal option through:
- Setting minimum standards for the location, design, construction and operation of landfills;
 - Setting targets for the diversion of Biodegradable Municipal Waste from landfill;
 - Controlling the nature of waste accepted for landfill; and
 - Defining the different categories of waste (hazardous waste, non-hazardous waste and inert waste) and applies to all landfills, defined as waste disposal sites for the deposit of waste onto or into land. The requirements of the Directive were transposed into national legislation through the Landfill (England and Wales) Regulations 2002 (as amended) and subsequently re-transposed as part of the Environmental Permitting (England and Wales) Regulations 2016 (as amended).
- 10.3.8 There are also a number of primary legislative instruments in the UK on waste listed below which enact a wide range of secondary legislation that governs the storage, collection, treatment and disposal of waste:
- The Environmental Permitting (England and Wales) Regulations 2016
 - Environmental Protection Act 1990;
 - The Environment Act 1995;
 - The Finance Act 1996;
 - Waste Minimisation Act 1998;
 - The Waste and Emissions Trading Act 2003; and
 - The Clean Neighbourhoods and Environment Act 2005.

National Policy

National Policy Statement for National Networks (NN NPS) 2014

- 10.3.9 The NN NPS⁶ requires that evidence of appropriate mitigation measures (incorporating engineering plans on configuration and layout, and use of materials) during both design and construction needs to be presented together

⁴ The Waste (England and Wales) (Amendment) Regulations 2014. Accessed online at: https://www.legislation.gov.uk/ukxi/2014/656/pdfs/ukxi_20140656_en.pdf

⁵ European Commission, 1999. Directive 1999/31/EC on Landfill of Waste (EU Landfill Directive)

⁶ Department for Transport, 2014. National Policy Statement for National Networks

with the arrangements for managing any wastes that are produced. It specifically states, at Paragraph 5.42 that:

‘The applicant should set out the arrangements that are proposed for managing any waste produced. The arrangements described should include information on the proposed waste recovery and disposal system for all waste generated by the development. The applicant should seek to minimise the volume of waste produced and the volume of waste sent for disposal unless it can be demonstrated that the alternative is the best overall environmental outcome.’

- 10.3.10 The NN NPS identifies that the Government policy on waste is intended to protect the environment, and human health, by producing less and using it as a resource wherever possible. Where this is not possible, the NN NPS identifies that waste management regulation ensures waste is disposed of in a way that is least damaging to the environment and to human health and that the waste hierarchy is utilised. This includes consideration of the ability for the waste from the development to be dealt with appropriately by waste infrastructure, without having an adverse effect on the capacity of existing waste management facilities to deal with other waste arising in the area.

National Planning Policy for Waste 2014

- 10.3.11 The National Planning Policy for Waste⁷ sets out the detailed waste planning policies for England and has been considered in conjunction with the NPPF, the National Waste Management Plan for England⁸ and National Policy Statements for Waste Water⁹ and Hazardous Waste¹⁰.

National Planning Policy Framework 2018

- 10.3.12 The National Planning Policy Framework (NPPF) sets out the Government’s planning policies for England. It does not contain specific materials or waste management policies, however, the framework includes reference to waste management by advocating that waste minimisation forms part of the environmental role of achieving sustainable development.

Waste Prevention Programme for England 2013

- 10.3.13 The Waste Prevention Programme is a requirement of the revised Waste Framework Directive (2008/98/EC). The Waste Prevention Programme¹¹ sets out the roles and actions for government and others to reduce the amount of waste produced in England.

Local Policy

Cornwall Local Plan (2016)

- 10.3.14 The Cornwall Local Plan¹² was formally adopted on 22nd November 2016 and provides an overarching planning policy framework for Cornwall up to 2030. Policies relevant to this chapter include:

⁷ Department for Communities and Local Government, 2014. National Planning Policy for Waste

⁸ Department for Environment Food & Rural Affairs, 2013. Waste Management Plan for England

⁹ HM Government, 2012. National Policy Statement for Waste Water

¹⁰ Department for Environment Food & Rural Affairs, 2013. National Policy Statement for Hazardous Waste

¹¹ Department for Environment, Food & Rural Affairs, 2013. Waste Prevention Programme for England

¹² Cornwall Council, 2016. Cornwall Local Plan

- Policy 17 Minerals – general principles
- Policy 18 Minerals safeguarding
- Policy 19 Strategic waste management principles
- Policy 20 Managing the provision of waste management facilities

10.3.15 The Plan takes into consideration the Waste Hierarchy and Policy 19 notes “*the Council will ensure that any likely impact on existing waste facilities is acceptable and does not prejudice the implementation of the waste hierarchy and/or the efficient operation of such facilities*”.

10.3.16 Three technical papers were published by Cornwall Council in January 2015 which provide the evidence and assumptions in relation to the waste and minerals figures set out in the Local Plan:

- Technical Paper W1: An Assessment of the Future Waste Arisings in Cornwall up to 2030¹³
- Technical Paper W2: Existing Waste Management Capacity in Cornwall¹⁴
- Technical Paper W3: An Assessment of the Additional Waste Management Provision Required in Cornwall up to 2030¹⁵

The information set out in these technical papers remains the most up to date information in relation to waste management capacity and forecasts in Cornwall, aside from the Environment Agency’s Waste Data Interrogator (WDI) which includes permitted sites only and is therefore perceived to provide a limited picture of capacity in the region.

Cornwall Minerals Plan (1998)

10.3.17 The Cornwall Minerals Plan¹⁶ provides existing policy on minerals. The chapters that are most applicable to this project are Chapter 9, Aggregates and Chapter 10, Secondary Aggregates and Recyclable Material.

Minerals Safeguarding Development Plan Document (2018)

10.3.18 Cornwall Council is preparing a Minerals Safeguarding Development Plan Document to identify areas of mineral resource which will be safeguarded for future use. An interactive map is available which identifies the proposed minerals safeguarding areas¹⁷.

Guidance

Internal Advice Note (IAN) 153/11 – Guidance on the Environmental Assessment of Material Resources

10.3.19 The assessment of the environmental effects associated with the use of material resources and the generation and management of waste resulting from the construction of the scheme has been undertaken in accordance with the guidance

¹³ Cornwall Council, January 2015. Technical Paper W1: An Assessment of the Future Waste Arisings in Cornwall up to 2030 [online] Accessed 03/05/2018

¹⁴ Cornwall Council, January 2015. Technical Paper W2: Existing Waste Management Capacity in Cornwall [online] Accessed 03/05/2018

¹⁵ Cornwall Council, January 2015. Technical Paper W3: An Assessment of the Additional Waste Management Provision Required in Cornwall up to 2030 [online] Accessed 03/05/2018

¹⁶ Cornwall Council, 1998. Cornwall Minerals Plan

¹⁷ Cornwall Council, 2018. Cornwall Council Interactive Map. Accessed online at: <https://www.cornwall.gov.uk/environment-and-planning/planning/planning-policy/adopted-plans/development-plan-documents/minerals-safeguarding-development-plan-document/>

provided within the Interim Advice Note (IAN) 153/11 – Guidance on the environmental assessment of material resources.

10.3.20 Reference has also been made to the following guidance relating to material resources and wastes:

- Interim Advice Note (IAN) 125/15 Supplementary Guidance for Users of DMRB Volume 11 'Environmental Assessment'¹⁸;
- Interim Advice Note (IAN) 153/11 Guidance on the Environmental Assessment of Material Resources¹⁹;
- DMRB Volume 11, Section 3 Part 3, Disruption Due to Construction²⁰. This covers the effect on people and on the natural environment which can occur, mainly during construction works; and
- Definition of Waste: Development Industry Code of Practice, Version 2 (Contaminated Land: Applications in Real Environments (CL:AIRE))²¹.

South West Regional Waste Strategy 'From Rubbish to Resource' (2004)

10.3.21 The Strategy²² is a non-statutory Regional Waste Strategy which aims to ensure that by the year 2020 over 45% of waste is recycled and reused and less than 20% of waste produced in the region will be landfilled.

Highways England Sustainable Development Strategy (2017)

The Strategy²³ sets out Highways England's approach for sustainable development which includes a vision for increasing efficiency in resource use and ensuring recycled materials are reused for the highest value purpose. The strategy sets out ambitions to:

- Push towards a "circular" approach to resource management;
- Work with suppliers to find new ways to deliver a more resilient and adaptive network; and
- Work to achieve security of supply.

Best Practice

10.3.22 The Pollution Prevention Guidelines²⁴ provide practical advice and guidance for the prevention of pollution during construction and demolition projects. The guidance explains what is required by law and describes good practice measures to reduce the risks of a pollution incident.

10.3.23 Although Pollution Prevention Guideline 6 'Working at Construction and Demolition Sites' was withdrawn on 14 December 2015 and is no longer maintained by the Environment Agency, such guidance continues to provide useful pollution prevention guidance on site.

¹⁸ Highways England, 2015. Interim Advice Note 125/15 Environmental Assessment Update. Accessed online at: <http://www.standardsforhighways.co.uk/ha/standards/ians/pdfs/ian125r2.pdf>

¹⁹ Highways England, 2011. Interim Advice Note 153/11 Guidance on the Environmental Assessment of Material Resources

²⁰ Highways England, 1994. Design Manual for Roads and Bridges. Volume 11 Section 3 Part 3 Disruption due to Construction

²¹ Contaminated Land: Applications in Real Environments (CL:AIRE), 2011. The Definition of Waste: Development Industry Code of Practice Version 2

²² South West Regional Assembly, 2004. South West Regional Waste Strategy 'From Rubbish to Resource'

²³ Highways England, 2017. Sustainable development strategy: our approach. [online] Accessed 30/05/18

²⁴ Northern Ireland Environment Agency, Scottish Environment Protection Agency, Environment Agency, July 2013. Guidance for Pollution Prevention (GPPs). Accessed online at <http://www.netregs.org.uk/environmental-topics/pollution-prevention-guidelines-gpps-and-replacement-series/guidance-for-pollution-prevention-gpps-full-list/>

Site Waste Management Plan

- 10.3.24 The UK Government removed the statutory requirement for Site Waste Management Plans (SWMP) in October 2013. SWMPs were previously required for construction and demolition projects in England. However, as their use is considered good practice, any requirements to ensure that demolition and construction wastes are dealt with in an appropriate manner, and in accordance with the waste hierarchy, would be met and secured by using a SWMP. This approach is consistent with the guidance in the National Policy Statement for National Networks (Department for Transport, December 2014) to implement sustainable waste management through the application of the waste hierarchy.
- 10.3.25 An outline Site Waste Management Plan (SWMP) has been prepared for the scheme as part of the outline Construction Environmental Management Plan (**Outline CEMP**) in Volume 6 Document Reference 6.4 Appendix 16.1. This sets out how the resulting waste will be managed during the construction of the scheme. The plan will be updated and implemented by the Contractor during construction.
- 10.3.26 Related guidance for the SWMP includes the following by Waste & Resources Action Programme (WRAP):
- WRAP SWMP template; and
 - WRAP Designing out Waste: a design team guide for Civil Engineering.
- 10.3.27 An outline Materials Management Plan (MMP) has also been prepared for the scheme as part of the **Outline CEMP** (Volume 6 Document Ref 6.4 ES Appendix 16.1). This sets out how materials would be managed during the construction of the scheme. This plan will also be updated and implemented by the Contractor during construction.

Strategic Targets

- 10.3.28 Targets for the use and management of material resources have been identified based on a review of the aforementioned policy documents and Highways England's own targets. These have been listed in Table 10-2.

Table 10-2 Targets for the use and management of material resources

Policy document	Target
EU Waste Framework Directive	<ul style="list-style-type: none"> • Waste should be managed without endangering human health and harming the environment • 70% of construction and demolition (C&D) waste (excluding naturally occurring waste) should be prepared for re-use, recycling and recovery
National Policy Statement for National Networks 2014	<ul style="list-style-type: none"> • Arrangements should be set out for managing any waste produced, including information on the proposed waste recovery and disposal system for all waste generated
National Planning Policy for Waste 2014	<ul style="list-style-type: none"> • The likely impact of the development on existing waste management facilities and areas allocated for waste management is acceptable and does not prejudice the

	<p>implementation of the waste hierarchy/efficient operation of such facilities</p> <ul style="list-style-type: none"> The handling of waste arising from the construction and operation of development maximises reuse/recovery opportunities, and minimises off-site disposal
Waste Prevention Programme for England 2013	<ul style="list-style-type: none"> Design should incorporate the removal of causes of waste early on
Cornwall Minerals Safeguarding Development Plan 2018	<ul style="list-style-type: none"> To ensure the development does not adversely impact on Cornwall's minerals industry
Cornwall Local Plan 2016	<ul style="list-style-type: none"> The likely impact of the development on existing waste management facilities and areas allocated for waste management is acceptable and does not prejudice the implementation of the waste hierarchy/efficient operation of such facilities
National and regional guidelines for aggregates provision in England 2005-2020	<ul style="list-style-type: none"> Recycled content target (alternative materials) of 25%

10.4 Study Area

- 10.4.1 The study area comprises two geographically different areas for the purposes of this assessment.
- 10.4.2 The first is the anticipated maximum physical extent of the scheme as defined by the scheme boundary (shown by the red line on Volume 6 Document Ref 6.3 ES Figure 2.1 General Arrangement). This is the area within which construction materials would be consumed and waste would be generated. Some materials would arise on site during construction, such as excavated soil and rock, or recycled elements of existing roads. These would be included within this study area, alongside a consideration of minerals safeguarding areas and peat resources, where relevant.
- 10.4.3 The second area incorporates the locations of feasible sources and availability of construction materials and suitable waste infrastructure that could accept arisings. This also includes the associated transportation networks which are likely to be used to transport the materials.
- 10.4.4 Professional judgement has been used to determine the extent of the second study area. The proximity principle has been taken into account alongside the value for money principle. Study areas 1 and 2 are provided on Volume 6 Document Ref 6.3 ES Figure 10-1.
- 10.4.5 It is outside the scope of the guidance to assess the indirect environmental effects associated with the extraction of raw materials from their original source and the manufacture of products which occur off-site. This stage of a material's life cycle are likely to have already been subjected to an environmental assessment. These effects are therefore not addressed in this chapter. It is also outside the scope of this chapter to undertake an assessment of greenhouse gas emissions associated with the use and transportation of materials. **Climate Change** (Volume 6 Document Reference 6.2 ES Chapter 14) includes an assessment of

the reasonable worst case scenario carbon emissions associated with the construction and operation of the scheme.

10.5 Assessment Methodology

- 10.5.1 This section sets out the methods that have been employed to undertake the material resources assessment, with reference to published standards, guidelines and best practice.
- 10.5.2 The assessment of the environmental effects associated with the use of material resources and the generation and management of waste resulting from the construction of the scheme has been undertaken in accordance with guidance provided within IAN 153/11.
- 10.5.3 The scheme's Scoping Report states that the IAN 153/11 would be used as guidance for the assessment, and this was recognised by the Inspectorate in the **Scoping Opinion** (Volume 6 Document Reference 6.4 ES Appendix 4.1), and noted that a clear methodology and clear cross-referencing to other topics in the ES should be provided in order to ensure a robust assessment **Scoping Opinion responses** (Volume 6 Document Ref 6.4 ES Appendix 4).
- 10.5.4 This guidance document, alongside the use of professional judgement and emerging best practice, will be used to assess environmental value, magnitude of effect and the significance of environmental effects from the use of material resources.
- 10.5.5 It was recommended through the Scoping Report that a Detailed level of assessment would be required in accordance with IAN 153/11.

Identification of Baseline

- 10.5.6 The existing baseline conditions have been identified as the receptors which have the potential to be impacted by the scheme. This includes the source of materials required for the construction of the scheme, and waste management facilities which may be used for the disposal or treatment of waste.
- 10.5.7 The baseline conditions have been informed by desk based studies and information from ground investigations, including (but not limited to):
- Ground investigations associated with the scheme;
 - Cornwall Local Plan; and
 - Local development policies and topic papers.
- 10.5.8 To identify the baseline conditions, data has also been collected from Highways England and members of the design team on the materials which are likely to be used during each stage of the scheme, and the waste that is likely to arise. This has been presented in Section 10.12.

Assessment of Construction Impacts

- 10.5.9 The assessment is a staged process with an initial simple assessment followed by a detailed assessment. The Simple Assessment comprises the assembly of data and information that is readily available to address potential effects identified at the Scoping level, to reach an understanding of the likely environmental effects to inform the final design, or to reach an understanding of the likely environmental effects that will identify the need for Detailed Assessment.

- 10.5.10 A Simple Assessment for this chapter was carried out at the Preliminary Environmental Impact Reporting stage, and the results of the Simple and Detailed assessment have been included in this chapter.
- 10.5.11 For the purposes of assessing the effects associated with materials use and waste, the Detailed Assessment presented in this chapter is a quantitative exercise which identifies the following:
- The types and quantities of materials required for the project;
 - Details of the source/origin of materials, site-won materials to replace virgin materials, materials from secondary/recycled sources or virgin/non-renewable sources;
 - The cut and fill balance;
 - The types and quantities of forecast waste arisings from the project, including the identification of any forecast hazardous wastes;
 - Surplus materials and waste falling under regulatory controls;
 - Waste that requires storage on site prior to re-use, recycling or disposal;
 - Waste to be pre-treated on site for re-use within the project;
 - Wastes requiring treatment and/or disposal off site;
 - The impacts that will arise from the issues identified in relation to materials and waste;
 - The impacts on capacity of waste management infrastructure;
 - A conclusion about the magnitude and nature of the impacts; and
 - The identification of measures to mitigate the identified impacts.
- 10.5.12 The Detailed Assessment utilises the data gathered at the Simple Assessment level along with additional information collated to quantify the materials required for the project, and forecasts the quantities and types of waste that will be produced.
- 10.5.13 The Detailed Assessment also includes identification of how the use of material resources conforms to high level strategy targets outlined in Table 10-2.

Assessment of Operational Impacts

- 10.5.14 The environmental impacts associated with material resource demand and waste generation during the scheme's operation are dependent upon the long term management regime. The assessment identifies the potential environmental impacts, based on the likely long term management regime during the operational stage.

Assessment Criteria

- 10.5.15 The Design Manual for Roads and Bridges (DMRB) HA 205/08 advice note has been used to inform the significance criteria for the scheme, in addition to professional judgement and engagement with the Overseeing Organisation.
- 10.5.16 The first stage of the assessment is an evaluation of the value (sensitivity) of the material resource or feature, based on an assessment of the quality, scale, rarity and the services provided. The value of the material resources along the alignment of the scheme is determined on the basis of the descriptions described from Table 2.1 of the HA 205/08. and provided in Table 10-3.
- 10.5.17 The value of the receptor is dependent on its capacity to provide materials or dispose of waste (i.e. the capacity of available waste management infrastructure).

Table 10-3 Environmental Value (or Sensitivity)

Value/Sensitivity	Typical descriptors
Very High	Very high importance and rarity, international scale and very limited potential for substitution.
High	High importance and rarity, national scale, and limited potential for substitution.
Medium	High or medium importance and rarity, regional scale, limited potential for substitution.
Low	Low or medium importance and rarity, local scale.
Negligible	Very low importance and rarity, local scale.

10.5.18 The second stage is an evaluation of the magnitude of impact that the scheme is likely to have on the receptor (Table 10-4). The magnitude of impact has been determined on the basis of the descriptions derived from Table 2.2 of the HA 205/08, and are provided in Table 10-4.

Table 10-4 Magnitude of Impact

Magnitude of Impact	Typical descriptors
Major	Loss of resource and/or quality and integrity of resource; severe damage to key characteristics, features or elements (Adverse).
	Large scale or major improvement of resource quality; extensive restoration or enhancement; major improvement of attribute quality (Beneficial).
Moderate	Loss of resource, but not adversely affecting the integrity; partial loss of/damage to key characteristics, features or elements (Adverse).
	Benefit to, or addition of, key characteristics, features or elements; improvement of attribute quality (Beneficial).
Minor	Some measurable change in attributes, quality or vulnerability; minor loss of, or alteration to, one (maybe more) key characteristics, features or elements (Adverse).
	Minor benefit to, or addition of, one (maybe more) key characteristics, features or elements; some beneficial impact on attribute or a reduced risk of negative impact occurring (Beneficial).
Negligible	Very minor loss or detrimental alteration to one or more characteristics, features or elements (Adverse).
	Very minor benefit to or positive addition of one or more characteristics, features or elements (Beneficial).
No Change	No loss or alteration of characteristics, features or elements; no observable impact in either direction.

10.5.19 The final stage of the assessment combines the value (sensitivity) of the receptor and the magnitude of impacts to arrive at a level of significance. The significance of effect has been derived in accordance with Table 10-5.

Table 10-5 Approach to Evaluating Significance of Effect

		Magnitude of Change				
Environment		No change	Negligible	Minor	Moderate	Major
		Negligible	Neutral	Neutral	Neutral or slight	Neutral or slight

	Low	Neutral	Neutral or slight	Neutral or slight	Slight	Slight or moderate
	Medium	Neutral	Neutral or slight	Slight	Moderate	Moderate or Large
	High	Neutral	Slight	Slight or moderate	Moderate or Large	Large or Very Large
	Very High	Neutral	Slight	Moderate or Large	Large or Very Large	Very Large

10.5.20 The significance of effects is described using the terms very large, large, moderate, slight and neutral. The broad definitions of these terms have been provided in Table 10-6. A sense check will be undertaken using professional judgment to ensure that the significance of criteria as determined in the matrix is in broad accordance with the definitions outlined in Table 10-6

Table 10-6 Significance Criteria for Material Assets and Waste

Significance Category	Description
Neutral	<p>Material Assets</p> <ul style="list-style-type: none"> Project achieves >99% overall material recovery/recycling (by weight) of non-hazardous construction and demolition waste to substitute use of primary materials; and Aggregates required to be imported to site comprise >99% re-used/recycled content; <p>Waste</p> <ul style="list-style-type: none"> No reduction or alteration in the capacity of waste infrastructure at a regional scale.
Slight	<p>Material Assets</p> <ul style="list-style-type: none"> Project achieves 70-99% overall material recovery/recycling (by weight) of non-hazardous construction and demolition waste to substitute use of primary materials, and Aggregates required to be imported to site comprise re-used/recycled content in line with the relevant regional or national percentage target <p>Waste</p> <ul style="list-style-type: none"> ≤1% reduction or alteration in the regional capacity of waste infrastructure; and Waste infrastructure has sufficient capacity to accommodate waste from a project, without compromising integrity of the receiving infrastructure (design life or capacity) within the region.
Moderate	<p>Material Assets</p> <ul style="list-style-type: none"> Project achieves less than 70% overall material recovery/recycling (by weight) of non-hazardous construction and demolition waste to substitute use of primary materials, and Aggregates required to be imported to site comprise re-used/recycled content below the lower of the relevant regional or national percentage target

	<p>Waste</p> <ul style="list-style-type: none"> • >1% reduction or alteration in the regional capacity of waste infrastructure as a result of accommodating waste from a project; and • 1-50% of project waste requires disposal outside of the region.
Large	<p>Material Assets</p> <ul style="list-style-type: none"> • Project achieves <70% overall material recovery/recycling (by weight) of non-hazardous construction and demolition waste to substitute use of primary materials; and • Aggregates required to be imported to site comprise <1% re-used/recycled content; and • Project sterilises ≥1 mineral safeguarding site and/or peat resource. <p>Waste</p> <ul style="list-style-type: none"> • >1% reduction in the regional capacity of waste infrastructure as a result of accommodating waste from a project; and • >50% of project waste requires disposal outside of the region.
Very Large	<p>Material Assets</p> <ul style="list-style-type: none"> • No criteria: use criteria for large category <p>Waste</p> <ul style="list-style-type: none"> • >1% reduction or alteration in national capacity of waste infrastructure, as a result of accommodating waste from a project; or • The project would require new (permanent) waste infrastructure to be constructed to accommodate waste.

10.6 Baseline Conditions

10.6.1 The baseline environment is comprised of receptors which have been identified based on the likely impacts set out in IAN 153/11. A list of the receptors which have the potential to be impacted by the scheme is provided in Table 10-7 with the relevant phase of the scheme.

Table 10-7 Receptors with the potential to be impacted by the phases of the scheme

Receptor	Phase
Primary Material Sources (on site)	Construction
Imported Material Sources (off site)	Construction/operation
Construction Materials Management Infrastructure (on site)	Construction
Construction Waste Management Infrastructure (off site)	Construction
Local traffic networks	Construction/operation
Strategic Targets	Construction

Primary Material Sources (on site)

- 10.6.2 As set out in **Geology and Soils** (Volume 6, Document Ref 6.2 ES Chapter 9), the scheme alignment is predominantly underlain by Devonian bedrock of the Gramscatho Basin Succession, comprising predominantly clastic sedimentary rocks formed from mud and sand produced by erosion and deposited in a deep marine environment.
- 10.6.3 The scheme alignment transects the thrust fault separating the Gramscatho Basin Succession and the Looe Basin Succession to the north. The Looe Basin Succession, comprising a shallow water facies of variable siliciclastic mudstones, siltstone and sandstones with internal structures representing strong water movements. The geology of the area is summarised in Tables 9.3 – 9.7 of **Geology and Soils** (Volume 6, Document Ref 6.2 ES Chapter 9).
- 10.6.4 There are no Regionally Important Geological Sites (RIGS) of geological or geomorphological significance within the Soils and Geology buffer zone (250m radius of the proposed alignment).
- 10.6.5 A Mineral Safeguarding Development Plan Document (DPD) is currently under development by Cornwall Council, and an interactive map of the proposed Minerals Safeguarding Areas is available online²⁵. There are no proposed minerals safeguarding areas within the first study area (within the Order Limits). There are minerals safeguarding areas in the second, wider study area which have been covered in paragraph 10.6.12 below.
- 10.6.6 A Ground Investigation Report (GIR) was prepared for the scheme by WSP in September 2017 following the site investigations that took place between January and March 2017²⁶. Section 1.2 of the GIR notes that the preliminary site investigations identified widespread generic assessment criteria (GAC) exceedances for lead and zinc, and recommended that further sampling of soils and surface water, with subsequent risk assessment, should be undertaken for these substances.
- 10.6.7 An addendum to the GIR was produced in May 2018 following further ground investigations²⁷. The results of the second phase of ground investigation indicate that contaminated materials within the physical extent of the works is minimal. A Geotechnical Design Report is to be produced at Stage 5, which will provide further detailed recommendations for material re-use. An Earthworks Specification will also be produced at Stage 5 which will set out the material reuse criteria in relation to chemical concentrations, however this information is not available at the time of the assessments.
- 10.6.8 The working assumption is that the majority of excavation materials onsite are likely to be suitable for reuse, thereby reducing the need to import materials to meet the cut and fill earthworks balance.
- 10.6.9 There are some materials known to be present which are potentially unsuitable for reuse and/or hazardous. There is an abandoned oil pipeline located between Ch. 11+700m and Ch.12+200m which runs underneath the proposed alignment. It has therefore been assumed that ≤5% of the site won material could be

²⁵ Cornwall Council Interactive Map, accessed January 2018 at:

<https://map.cornwall.gov.uk/website/ccmap/?zoomlevel=1&xcoord=178566&ycoord=54274&wsName=ccmap&layerName=Proposed%20mineral%20safeguarding%20areas:Proposed%20minerals%20safeguarding%20areas%20M18%20South%20Crofty%20shafts%20>

²⁶ Highways England, 2017. A30 Chiverton to Carland Cross Ground Investigation Report.

²⁷ Highways England, 2018. A30 Chiverton to Carland Cross GIR Addendum

unsuitable and/or contaminated. The sensitivity of the primary material sources (on site) is thus considered to be **low**.

Imported Material Sources (off site)

- 10.6.10 The scheme would require both primary raw materials, such as stone and soil, and manufactured construction materials such as concrete, asphalt and steel.
- 10.6.11 The imported manufactured material would be sourced from established suppliers who regularly provide materials for similar sized projects. The suppliers have not yet been determined, but the Contractor would ensure that they are suppliers with adequate resources to meet the quantitative needs of the scheme, without having a negative influence on their resources. Where possible, materials would be provided from local sources in accordance with the proximity principle, although the Contractor would work to ensure a balance with the value for money principle. The sensitivity of the manufactured material sources is thus considered to be **low**.
- 10.6.12 The sensitivity of the raw material sources has been determined through the availability of materials in Cornwall. As set out in the Draft Minerals Safeguarding Development Plan Document, Cornwall has a wealth of mineral resources which have been exploited over time²⁸ and has therefore implemented procedures for safeguarding minerals. The Draft Minerals Safeguarding Development Plan Document is currently undergoing review. There are a number of proposed minerals safeguarding areas in Cornwall set out in the Plan.
- 10.6.13 The main raw materials currently available in Cornwall are granite (for aggregates and building stones), china clay, slate and sandstone. Cornwall has over 110 sites permitted for mineral working²⁹. The scheme would require some imported raw materials for the cut and fill balance in order to aid programme requirements.
- 10.6.14 The Cornwall Local Plan (2016) notes that it is necessary to maintain a sufficient supply of minerals, and provides a breakdown of the available minerals in the county. Table 10-8 provides a breakdown of the status of mineral groups.

Table 10-8 Status of Mineral Groups in Cornwall County (that could be used in construction)

Mineral	Status
Primary crushed rock aggregate	No need to allocate further sites for extraction.
Primary hard rock aggregate	Capable of meeting demand beyond Plan period. No need to allocate further sites for extraction.
China clay	Reserves anticipated to provide supply for almost 60 years.
High Specification Aggregates (HSA) used for skid resistant road surfaces	Shortage in Cornwall. Most material required is imported from outside Cornwall.
Metal	Unable to report due to commercial confidentiality

28 Cornwall Council, 2018. Safeguarding Development Plan Document: Schedule of Modifications. [online] Accessed 19/06/2018
 29 Cornwall Council, 2011. Minerals Issues Paper. [online] Accessed 18/05/2017

- 10.6.15 Table 10-8 indicates that there is an availability of primary crushed rock aggregate and primary hard rock aggregate, however there is a lack of long-term availability of china clay and High Specification Aggregates in the region. The china clay reserves have been estimated at over 60 million tonnes by the British Geological Survey³⁰, which indicates that current extraction is 1 million tonnes per year. It is the waste product of china clay extraction that will be required for the proposed scheme, rather than the china clay itself, and it is therefore considered that this will be available through the ongoing extraction (thereby not depleting china clay reserves).
- 10.6.16 Whilst there is a shortage of HSA in Cornwall, information is not available with regards to the national availability of this product, however national suppliers exist and are regularly used by Highways England in their road schemes.
- 10.6.17 Based on this, the overall sensitivity of off-site raw material sources is considered to be **low**.

Construction Materials Management Infrastructure (on site)

- 10.6.18 Construction compounds will be situated along the route of the proposed A30. There will be two main compounds at the Western and Eastern ends of the scheme (Ch0+700-800 and Ch13+500-900). There will also be compounds along the route for the construction of the overbridges and underbridges. The compounds will provide designated areas for storing materials, including topsoil and subsoil storage, in addition to designated areas for storing waste arisings. Areas have been identified for bulk stone and topsoil stockpiling and storage aside from these compounds and have been indicated on the General Arrangement drawings in Volume 6 Document Ref 6.3 ES Figure 2.1. Environmental management measures associated with the storage of materials and waste have been set out in the **Outline CEMP** (Volume 6 Document Reference 6.4 Appendix 16.1).
- 10.6.19 These areas have been identified as part of the engineering design for storing the material based on the likely storage requirements. The sensitivity is thus considered to be **low**.

Construction Waste Management Infrastructure (off site)

- 10.6.20 Waste management within Cornwall has traditionally been heavily reliant on landfill disposal³¹. There is increasing recognition that the landfilling of waste is unsustainable. Furthermore, landfill disposal is becoming increasingly expensive and capacity is becoming exhausted.
- 10.6.21 The Cornwall Local Plan (2016) states that waste production associated with the Construction, Demolition and Excavation (CDE) industries is expected to increase by approximately 230,000 tonnes per annum for the remainder of the Plan period up until 2030. In order to manage the increase in waste, the Plan states that additional waste management infrastructure is required.
- 10.6.22 The figures used within the Local Plan are based on a number of studies undertaken by Cornwall Council in 2015 (set out in Technical Papers W1 – W3).

30 Cornwall Council, 2016. Cornwall Local Plan

31 Cornwall Council, 2016. Minerals, Waste and Renewable Energy. [\[online\]](#) Accessed 18/05/2017.

Technical Paper W3 reports that the total licensed capacity for CDE waste at the time of the studies was estimated at:

- 409,981 tonnes for recycling/reuse – annual license; and
- 549,095 tonnes for landfill void space (in total)³².

10.6.23 The paper notes that current CDE waste recycling rates exceed the current levels of permitted processing capacity already, however notes that this is due to additional recycling which takes place on site where the materials arise and on sites that do not need formal licenses.

10.6.24 Table 10-9 provides the future waste management infrastructure requirements for CDE waste, as provided in the Local Plan and the supporting Technical Papers. The forecasts have been made using data collected through surveys between 1999 and 2008. The Council is due to undertake an evidence review of the adopted Local Plan towards the end of 2018. This information will not be available in advance of Highway England's Development Consent Order (DCO) submission, and the 2008 figures thus remain the most up to date information on the estimated waste management infrastructure requirements in Cornwall.

Table 10-9 Waste Management Infrastructure Requirements

Waste stream	Recycling/re-use	Landfill
Construction, demolition and excavation waste	Approximately 377,000 tonnes/annum	Approximately 659,000m ³ in total

10.6.25 Information has also been retrieved from the Environment Agency's Waste Data Interrogator (WDI), as recommended by Cornwall Council. This information provides an overview of the amount of CDE materials processed at waste management facilities in Cornwall, although this is limited to sites which have environmental permits for the acceptance of waste, and thus does not provide a complete picture. This information has been used however as part of the baseline gathering exercise to provide a more up to date indication of capacity.

10.6.26 Cornwall Council also provided a list of sites known to accept and recycle construction and demolition waste. This information is listed in **List of sites known to accept CDE waste** (Volume 6, Document Ref 6.4 Appendix 10.2) with the processed materials information from the WDI in 2016. This information is also presented in Volume 6 Document Ref 6.3 ES Figure 10-1.

10.6.27 The capacity of each of the sites listed in **List of sites known to accept CDE waste** (Volume 6, Document Ref 6.4 Appendix 10.2) to accept additional waste is not currently known, however the waste processed in 2016 amounts to a total of 572,120 tonnes where known. This is in broad accordance with the figures set out in paragraph 10.6.22.

10.6.28 Cornwall Council's Technical Paper on capacity of waste management facilities in Cornwall states that approximately 73,000 tonnes of hazardous waste will be produced annually in Cornwall by 2030 and notes that there will be no need for additional hazardous waste recycling/re-use facilities, but that there is a shortfall for hazardous waste landfill sites. The paper notes that due to the specialist

³² Cornwall Council, 2012. Technical Paper W3. An Assessment of the Additional Waste Management Provision Required in Cornwall up to 2031. [online] Accessed 03/05/2018

nature of hazardous waste management facilities, they are usually operated at the regional or national scale.

10.6.29 Table 10-10 sets out the indicative capacity of hazardous waste management facilities in the South-West region and England based on data made available through the Waste Management 2016 in England data tables, produced by the Environment Agency³³.

Table 10-10 Indicative capacity of hazardous waste management facilities

Hazardous waste disposal/recovery options	Indicative capacity	
	South-west	England
Landfill (total)	1.7 million tonnes	19.3 million tonnes
Incineration (annual)	10,000 tonnes	1 million tonnes
Recovery, recycle and reuse (annual)	100,000 tonnes*	1.4 million tonnes*
Treatment (annual)	50,000 tonnes*	1.3 million tonnes*
Total	1.9 Million tonnes	23 Million tonnes

*These figures have been taken from the Waste Management in England data tables produced by the Environment Agency. These figures have been based on the fate of hazardous waste deposits in 2016 to provide an indication of capacity for recovery, recycle and reuse and treatment, as capacity figures for these options were not available at the time of writing.

10.6.30 The Cornwall Local Plan estimates that there will be no need for additional hazardous waste recycling/reuse facilities in Cornwall, and Table 10-10 that there is capacity within the South-West region and England. As set out in Table 10-9 however, additional facilities are required to manage the projected non-hazardous waste during the Plan period. As such, the sensitivity of the construction waste management infrastructure (off site) when combined is considered to be **high**.

Local road network

10.6.31 The scheme would require the transportation of materials and waste to, from and within the site. The section of the A30 that the scheme is due to replace experiences congestion and delays throughout the year, particularly in the summer months when traffic flows increase due to tourist traffic.

10.6.32 As set out in Section 3 of the Transport Report (Volume 7 Document Ref 7.5), the A30 currently experiences heavy congestion, and during the summer months it currently operates over capacity.

10.6.33 Current AADT traffic flows of the existing A30 and local roads state that the existing AADT on A roads in the vicinity of the scheme ranges from between 10,000 and 40,000 vehicles per day. The sensitivity of the local road network to increases in road use due to the transportation of materials is considered to be **high**.

High level strategy targets

³³ Environment Agency, 2018. Waste management 2016 in England: data tables. Accessed online at: <https://www.gov.uk/government/publications/waste-management-for-england-2016>

- 10.6.34 The high level targets for the use and management of material resources have been documented in Table 10-2. These include both quantitative targets, for example as set out in the Waste Framework Directive, and general measures which the scheme should be in accordance with, for example the National Planning Policy for Waste.
- 10.6.35 The targets are set out in legislation and policy documents and Highways England is familiar with working in accordance with these. The sensitivity of these targets being met is therefore considered to be **low**.

10.7 Potential Impacts

- 10.7.1 For material resource use, the potential environmental effects are associated with the sourcing and transportation of primary raw materials, the sourcing of secondary products and their subsequent transport and use during construction. There are also potential environmental effects associated with the site won material, such as the requirement to transport, store and possibly process any materials during construction.
- 10.7.2 For waste materials, the potential environmental effects are associated with the production, movement, transport, processing and disposal of arisings from site to alternative sites or landfill during construction. The scheme has the potential to generate large amounts of Construction, Demolition and Excavation (CDE) waste which may affect the capacity of Cornwall's waste management infrastructure. As set out in the Local Plan, waste production associated with CDE industries is expected to increase by 230,000 tonnes per annum to 2030 which has led to a need for additional waste management facilities in the region³⁴.
- 10.7.3 The impacts during the scheme's operation are likely to be associated with the maintenance of the road surface and structures, and are not anticipated to be significant.

10.8 Consultation

- 10.8.1 An overview of consultation undertaken to date on the scheme has been provided in **Approach to EIA** (Volume 6 Document Ref 6.2 ES Chapter 4).
- 10.8.2 Cornwall Council has provided the following information to inform this chapter:
- a list of currently licensed waste facilities which accept CDE waste and are known to Cornwall Council;
 - reference to the Environment Agency's Waste Data Interrogator (WDI) although it was noted that this does not provide a complete picture;
 - confirmation that the waste forecasting data used in the Local Plan is the most up to date information at present; and
 - information on planning applications for proposed waste facilities in Cornwall.

10.9 Assessment Assumptions and Limitations

- 10.9.1 The assessment of material resources and waste arising from construction is still a developing area; detailed assessment guidance is therefore not yet available on some aspects of the assessment process. This limitation has been considered

34 Cornwall Council, 2016. Cornwall Local Plan

and the IAN 153/11 has formed the basis for the assessment, alongside professional judgment and best practice.

- 10.9.2 The construction of the scheme will be carried out in accordance with best practice, which will be set out in the CEMP and management plans. This will include the environmental measures that will be adopted during the construction phase, such as the Site Waste Management Plan. An **Outline CEMP** has been provided in Volume 6 Document Reference 6.4 ES Appendix 16.1. The **Outline CEMP** will be updated following the provision of further detail on appointment of the Contractor.
- 10.9.3 The quantities of secondary manufactured materials to be used for construction of the scheme, the sources from where they would be obtained and their mode of transport is yet to be finalised and have been estimated based on information from the bill of quantities at Design Fix 2 (an updated bill of quantities has not been developed for Design Fix 3). These have been set out in Table 10-12 of this chapter. This is consistent with the quantities used for the carbon assessment and reported in **Climate Change** (Volume 6, Document Ref 6.2 ES Chapter 14).
- 10.9.4 The quantities of waste likely to arise have not been provided however waste production will be minimised with attempts to maximise reuse wherever possible, in line with the targets set out in Table 10-2. The earthworks volumes are however based on Design Fix 3.

Limits of deviation

- 10.9.5 An assessment has been conducted within the limits of deviation outlined in Limits of Deviation within **Approach to EIA** (Volume 6 Document Ref 6.2 ES Chapter 4)
- 10.9.6 Deviations within the LOD could change the quantities of cut and fill required to construct the scheme. With an increase in cut, there could be an increase in the quantities of material that need to be removed from site. With a decrease in the amount of cut, additional material may need to be imported to site to meet the shortfall in site won fill.
- 10.9.7 It is considered unlikely that the localised alignment changes permitted by the LOD could have a significant effect on material volumes and consideration would be given to maintaining an earthworks balance during detailed design. Therefore, the proposed limits of deviation will not give rise to any materially new or materially worse adverse environmental effects from those reported in the ES in this chapter (Volume 6 Documents Reference 6.2 ES Chapter 10).

10.10 Design, Mitigation and Enhancement Measures

Engineering Design

- 10.10.1 The construction programme has incorporated a number of measures to reduce impacts during construction. The programme has been split into sections and the earthworks will be undertaken across three seasons (2020, 2021 and 2022). The earthworks are programmed to commence in 2020 with the Chybucca interchange. This will enable a haul road to be constructed through Chybucca in order to allow material from Ch6+300 – Ch7+300 to be transferred to Chiverton interchange in the following season. This would reduce use of the local road network during the following seasons.

- 10.10.2 The earthworks seasons would commence in mid-March and continue until the end of September during each of the initial three years of construction. Earthworks activity would be undertaken over a six day week during these seasons, and nightshifts would likely be used for the bulk materials that would need to be hauled on the existing A30 to reduce impact on the existing summer congestion.
- 10.10.3 The initial scheme design had an approximate cut-fill shortfall based on all earthwork slopes being at 1:2. This led to a 200,000m³ material shortfall.
- 10.10.4 The design of the scheme was examined and it was established that by altering the cut from 1:2 to 1:2.5 slopes along the scheme, the shortfall that was encountered could be significantly reduced. The design has since been amended further, including lowering of the vertical alignment at Ch6+300 – 7+300 and Pennycomequick (Ch10+000 – 11+400) which has significantly reduced the amount of material that would need to be imported. The total earthworks balance for Design Fix 3, which forms the basis of this assessment, generates 15,000m³ of material. It is anticipated that this will be suitable for reuse in proposed localised landscape bunding and essential landscaping mitigation areas. As set out in paragraph 10.6.9, some material is likely to be unsuitable for reuse and will be appropriately disposed of off site.
- 10.10.5 Based on excavation of topsoil across the site (average thickness of 350mm) and the quantity of topsoil required in new verges and earthworks (typical thickness of 450mm), the net topsoil volume would equate to a 65,000m³ surplus to be re-used on site within junctions and essential landscaping areas.
- 10.10.6 Whilst a surplus of 15,000m³ general fill material will be generated, approximately 10,000m³ of general fill material would need to be imported for the scheme during the first season in order to meet the requirements of initial side road diversion works at Chiverton and Carland Cross junctions which is required to provide access to the significant cut areas. This would be sourced from local quarries.
- 10.10.7 The approximate earthworks volumes based on Design Fix 3 were calculated based on the following assumptions:
- Based on other similar schemes with good ground conditions, and noting the 1km of abandoned oil pipeline on the scheme and the low risk of aground contamination, it is assumed that ≤5% of the total site won material could be unsuitable for reuse as engineering fill and/or be contaminated. This ≤5% figure also includes for any material which is lost during the process of excavation and placement; standard best practice measures will be put in place to ensure that this is minimised, as outlined in the Outline CEMP (Volume 6 Document Ref 6.4 ES Appendix 16.1).
 - The assumed bulking factor (increase in volume when material is excavated and then recompacted) for the site won material is 5%. The 5% of site won material unsuitable for reuse as engineering fill is therefore assumed to be cancelled out by the increase in suitable material volume as a result of bulking.
- 10.10.8 Construction of the scheme would take account of normal good practice measures to reduce resource use and the generation of waste. Wherever possible, surplus site won materials would be used in construction. Site won materials would only be reused on site if assessed as being suitable for reuse without causing unacceptable impacts on the end users and the environment. A

specification for suitable material to be used in construction would be developed, in accordance with the Specification for Highway Works. Where appropriate, testing shall be undertaken during construction to confirm that the materials used meet the specification requirements which have been developed in line with the CL:AIRE Code of Practice. Work undertaken to date and documented in the GIR Addendum indicates that the majority of onsite earthworks material is suitable for reuse.

Construction Mitigation

10.10.9 It would likely be necessary to remove some unsuitable and excess materials from site which may result on impacts on waste management infrastructure and the local road network. A Site Waste Management Plan would be produced to detail the estimated quantities of waste material and the opportunities for reuse, recycling, recovery or disposal. An outline Site Waste Management Plan has been provided in the **Outline CEMP** (Volume 6 Document Ref 6.4 ES Appendix 16.1).

10.10.10 In order to limit the quantity of material that may be required to be disposed of to landfill thereby reducing impacts on local waste management infrastructure, the materials would be sorted/processed and where necessary treated (through for example, sorting and drying onsite) and the materials disposed of or reused as appropriate for the particular waste stream. The pre-treatment of waste material prior to disposal is a requirement of the waste regulations. By minimising the quantity of materials to be disposed of offsite the associated Heavy Goods Vehicles (HGV) movements would also be minimised thereby reducing impacts on the local road network.

10.10.11 The haul road and localised areas of temporary roads will be used to transport materials around the site, thereby further reducing impacts on the existing local road network.

10.10.12 Table 10-11 sets out the proposed mitigation measures associated with each project activity.

Table 10-11 Proposed mitigation measures

Project Activity	Potential impacts associated with material resource use/ waste management	Description of mitigation measures	How the measures will be implemented, measured and monitored
Site clearance	Waste disposal	Reuse on site where possible. Recycle/recovery opportunities.	Site Waste Management Plan and Materials Management Plan to implement, measure and monitor. Material to be reused on site where possible. Any excess materials to be sorted and where practical disposed of to local recycling facilities.
Earthworks	Use of primary resources	Reuse of materials in earthworks.	Design to maximise the earthworks balance. Site

Project Activity	Potential impacts associated with material resource use/ waste management	Description of mitigation measures	How the measures will be implemented, measured and monitored
	Waste disposal	Limit disposal and movements	Waste Management Plan to implement, measure and monitor.
Pavement planings	Waste disposal	Reuse as sub base in footpaths. Reuse in pavement construction. Reuse elsewhere.	Design to maximise the earthworks balance. Site Waste Management Plan to implement, measure and monitor.

Operation Mitigation

10.10.13 The environmental impacts associated with material resource demand and waste generation during the scheme's operation are not considered to be significant. The impacts are dependent upon the long term management regime. It is not considered that any mitigation will be required beyond best practice management in line with the principles of the waste hierarchy.

10.11 Assessment of Effects

10.11.1 This section assesses the potential effects of the materials used and waste generated during the construction and operation phase of the scheme.

Construction effects

Material resources

10.11.2 A variety of different materials would be required for the construction phase of the scheme. The scheme has been designed to minimise the quantity of imported construction materials, as well as minimise the quantities of waste taken off site by reusing or recycling the available existing materials along the scheme.

10.11.3 The types and provisional estimated quantities of materials required for the construction and operational phase of the scheme are listed in Table 10-12 and are based on the Design Fix 3 information.

Table 10-12 Material resources required

Project Activity	Material resources required for the project	Quantities of material resources required	Additional information on material resources
Site remediation/ preparation/ earthworks	Topsoil required for new verges and earthworks	280,000m ³ (based on 450mm depth)	Sourced from site. Stored on-site before re-use on the new embankment and cutting slopes and within landscape areas.
Site construction:			

Project Activity	Material resources required for the project	Quantities of material resources required	Additional information on material resources
<ul style="list-style-type: none"> Cut and fill 	General fill, including earth embankments (mainline and side roads)	1,175,000m ³	Sourced from material won on site
		10,000m ³	This will be sourced from local quarries due to programme requirements (within 15 miles radius)
<ul style="list-style-type: none"> Installation of pavement 	<ul style="list-style-type: none"> Type 1 sub-base Base Binder Surface course 	<ul style="list-style-type: none"> 160,000 m³ 75,000 m³ 22,000 m³ 15,000 m³ 	Sourced from local suppliers
<ul style="list-style-type: none"> Installation of manufactured products 	Drainage, kerbs, traffic signs, lighting, safety barriers etc.	Various quantities relative to road length and necessary safety measures	Sourced from local/national suppliers, dependent upon material required.
<ul style="list-style-type: none"> Structures 	Concrete, including pre-cast structures	Various quantities relative to road length and necessary safety measures	Local batching plants (3 plants exist in Redruth and Indian Queens which only produce 30-60m ³ /hour) therefore need to supplement with national industry. Majority of precast factories in the UK are situated in the Midlands so likely to be sourced from outside Cornwall.
	Steel	Various quantities relative to road length and necessary safety measures	Likely to be sourced from a national supplier. Closest availability would be Somerset/South Wales.
TOTAL BALANCE OF MATERIALS	Material sourced from site Material sourced from offsite	1,455,000m³ 282,000m³ and various quantities relative to road length and necessary safety measures	

Waste arisings

10.11.4 The types of waste arisings associated with the construction phase of the scheme are listed in Table 10-13 Table 10-13.

Table 10-13 Estimated waste arisings

Project Activity	Waste arisings from the project	Quantities of waste arisings	Additional information on waste arisings
Site remediation/ preparation/ earthworks	Vegetation surface strip and trees	Estimated habitat loss ¹ indicates the loss of 7.7ha of woodland, 100 individual trees, 4.49km of Cornish hedgerow, 7.09m of soft hedgerow, 0.41ha of heathland, 15.73ha of semi-improved and poor semi-improved grassland, 1.49ha of marshy grassland, 13.88ha of dense scrub, scattered scrub, introduced shrub, and tall ruderal, 0.03ha of bracken, 43.59ha of arable, 77.01ha of improved grassland, and 2.17ha of amenity grassland.	Likely to be a combination of local recycling facilities, disposal at an inert or non-hazardous landfill site. There is the potential to create habitat log piles from wood over 250mm in diameter in discreet locations along the scheme, and to reuse stone from the Cornish hedgerow.
	Traffic signs, lighting columns and foundations, safety barriers and kerbs	350m ³ steel 680m ³ concrete 320m ³ brick 40m ³ wood	
Demolition	Bridge, house and road demolition including supports, rails, voids	1120m ³ concrete 33200m ³ asphalt 35000m ³ aggregate 10m ³ aluminium	Some material may be suitable for reuse on site. The remaining will likely be managed through a combination of local recycling facilities, disposal at an inert or non-hazardous landfill site.
Site construction	Surface planings	Not available at this stage.	Likely to be a combination of local recycling facilities, disposal at an inert or non-hazardous landfill site.
	Site won material (hazardous)	~72,750m ³ (≤5% of total excavated material)	This is a worst case ≤5% assumption. Any hazardous material will be taken to a licensed waste management facility, such as the Biffa site 315km from the proposed scheme. Should a more local and suitable hazardous waste management facility be identified, this

Project Activity	Waste arisings from the project	Quantities of waste arisings	Additional information on waste arisings
			could be used for the hazardous material.
Operation	Over the course of a 40-year design life, this will involve: <ul style="list-style-type: none"> Removal of surface course on a 10 year cycle Removal of kerbs, drainage system, road signs on a 20 year cycle 	Not available at this stage.	This will be managed by the Overseeing Organisation and is likely to consist of a combination of local recycling facilities, disposal at an inert or non-hazardous landfill site.
Total mixed C&D waste	23,240 tonnes² (6% of available recycling capacity in Cornwall)		
Total mixed hazardous C&D waste	~19,645 tonnes (1% of available capacity in the South-West and 0.001% of available capacity in England)		

¹ Where exact figures of habitat loss were unknown, a precautionary approach has been taken where it has been assumed that all habitat of that type within the redline boundary will be lost. It is therefore likely that some of these figures are over-estimations of what will actually be lost due to the scheme.

² WRAP's waste volume to mass conversion factors (July 2014) used to convert volume to mass for the purposes of this assessment, using conversion factor 0.32 for mixed C&D waste (17 09 04) and conversion factor 0.27 for mixed hazardous C&D waste (17 09 03) following WRAP's 2013 evidence based review of the conversion factors.

Primary material sources (on site)

- 10.11.5 The earthworks to be undertaken for the new road and bridges would involve cutting into existing topography and the construction of embankments to accommodate infrastructure that is elevated above the main carriageway (i.e. bridges).
- 10.11.6 The source of the primary material to be used from on site sources is considered to be of **low** sensitivity as this is within the study area of the scheme and there are no proposals in place to safeguard the material. In addition, work undertaken to date and documented in the GIR Addendum indicates that the majority of onsite earthworks material is suitable for reuse, with a current working assumption that ≤5% will not be suitable or available for reuse. Further assessments as part of the earthworks design are ongoing to classify materials and identify suitability locations for materials for reuse.
- 10.11.7 The earthworks on site will result in a surplus of material, in the region of 15,000m³. The magnitude of effect on the source of primary materials on site is therefore considered to be **no change** as the materials to be excavated will be re-used on site, thereby achieving >99% overall material recovery. The significance of effect on the source of on site primary materials is therefore considered to be **neutral**.

Imported material sources (off site)

- 10.11.8 The majority of the primary material (general fill) required for the earthworks can be won on site, therefore reducing the impact on off site material sources. As set out in paragraph 10.10.6 above, approximately 10,000m³ of material would need to be imported to meet the programme requirements. This material can be sourced from local China Clay quarries. The extraction of china clay results in a

waste product which is commonly used as aggregates in the construction industry.

- 10.11.9 China clay is currently being extracted in Cornwall at a rate of approximately 1 million tonnes per year, however this extraction contains between 12-15% of commercially-saleable clay according to information set out in Cornwall Council's draft Minerals Safeguarding Development Plan Document³⁵. This indicates that a maximum of 850,000 tonnes of waste is produced each year, which can be sold to the construction industry for use as an aggregate. This should satisfy the demand required for the scheme without directly impacting on the china clay reserves.
- 10.11.10 High Specification Aggregate will be required for sections of the mainline where there are departures, and on the junction approaches. Information is not currently available as to how much of this material will be required or the sources likely to be used. Due to the limited availability in Cornwall, it is expected that this material will be imported from outside of the region, from established suppliers who regularly provide the material for construction.
- 10.11.11 The sensitivity of the off site material source for primary material has been considered to be **low** due to the general availability of materials required, although the likelihood that some will need to be imported from outside of the region.
- 10.11.12 The sources will be confirmed following appointment of a Contractor, who will work to ensure that sourcing considers the balance between the proximity principle and value for money principle. As the materials required are commonly used in the construction industry, the demand relative to supply will not be detrimental to available resources. The magnitude of impact on the off site sources of primary raw materials is therefore considered to be at worst minor. The total primary material known to be required to be imported is 10,000m³ which is <1% of the total required. The significance of impact is therefore considered to be **neutral/slight adverse**.
- 10.11.13 There would be a net import of manufactured products for the scheme, which could potentially have an effect on offsite material sources. The sensitivity of the source of these materials is considered to be **low**. The Contractor would work to ensure that materials are sourced from established local or regional suppliers who regularly provide materials for commercial projects. Preliminary information has been gathered on potential suppliers in the region. This has been provided in **Suppliers and local quarries/plants** (Volume 6, Document Ref 6.4 ES Appendix 10.1).
- 10.11.14 Estimated quantities and types of construction materials have been provided in Table 10-12. Based on the scheme being of a relatively moderate size compared to other road schemes in the UK, the quantities of materials likely to be required have the potential to be relatively large in the context of material suppliers. The magnitude of effect is assessed to be **moderate adverse** in the context of supply of materials. The significance of effect from construction on the material sources is considered to be **slight adverse**. The recycled content of this material will not be determined until the Contractor has been appointed, however the Contractor will work to ensure that the materials comprise re-used/recycled aggregates in

³⁵ Cornwall Council. 2018. Cornwall Minerals Safeguarding Development Plan Document Modifications Consultation March 2018 [online]

line with the regional target of 25%. In particular, materials may be won during the demolition works which can be reused on site. These are outlined at 10.11.17 below.

Construction material management infrastructure (on site)

- 10.11.15 The scheme would involve the storage of materials throughout the construction phase due to the movement of earthworks materials within the site and import of construction materials to site.
- 10.11.16 The scheme also has the potential to generate some non-hazardous waste which would be handled at the storage compounds prior to transfer to external waste management sites. Site clearance works would include the clearance of existing trees, safety barriers, concrete kerbs, lighting columns and traffic signs.
- 10.11.17 Several existing structures would require demolition. Materials that may be won during the demolition works, and which may potentially be reused, are set out below:
- Bituminous pavement material;
 - Aggregate sub-base;
 - Fill and landscaping material;
 - Reinforced concrete and concrete;
 - Masonry and brickwork; and
 - Reinforcement and structural steelwork.
- 10.11.18 Where possible, demolition materials proposed for reuse would be appropriately processed on site to meet specification requirements.
- 10.11.19 Earthworks calculations undertaken as part of Design Fix 3 estimate a surplus of approximately 15,000m³ of material from the main earthworks. This figure will be more accurately calculated once detailed design information is available. It is anticipated that this will be suitable for reuse in proposed localised landscape bunding and essential landscaping mitigation areas.
- 10.11.20 The two main compounds will provide material storage, fuel storage, washout pits for concrete and sweepers, a waste segregation area and topsoil/subsoil storage area. There will be compounds for each junction and side road overbridge and underbridges which will include storage for piling, formwork and reinforcement materials, fabrication area for bridge beams, plant lay down area and local topsoil/subsoil storage. Areas have also been identified for bulk stone and topsoil stockpiling and storage in addition to these areas, located at Ch5+600, Ch6+600 and Ch8+300.
- 10.11.21 Location of the construction compounds has been determined to prevent pollution, minimise waste and to encourage ease of use, and has taken into account environmental considerations including the potential for leakage and contamination. It is currently assumed that there will be minimal earthworks material unsuitable/unavailable for reuse (working assumption of approximately ≤5%). Storage of any contaminated material prior to treatment or disposal off site will be in a designated, bunded area on an impermeable surface, in line with Pollution Prevention Guidelines. The CEMP sets out the measures for managing waste and materials onsite. The magnitude of effect of the storage of materials on the construction material management infrastructure is considered to be **negligible**, as the potential for the storage of materials has been incorporated

into their design, and measures will be incorporated to reduce contamination potential. The significance of effect from construction is considered to be **neutral**.

Construction waste management infrastructure (off site)

- 10.11.22 It is proposed that all materials arising from construction would be managed in accordance with the waste hierarchy defined within the Waste Framework Directive.
- 10.11.23 The amount of waste likely to arise throughout the construction of the scheme has been set out in Table 10-13, however measures would be in place to ensure that waste would be reused on site where possible.
- 10.11.24 Some waste arisings would not be required for reuse on site and, where this is the case, efforts would be made to reduce the need to export this to local waste management facilities by, for example, re-using for legacy projects or donating to charity.
- 10.11.25 Should any asbestos be found onsite during construction, demolition and excavation works, the Contractor would work in accordance with the Scheme Asbestos Management Plan in the **Outline CEMP** (Volume 6 Document Ref 6.4 ES Appendix 16.1 Annex O Scheme Asbestos Management Plan).
- 10.11.26 Waste management facilities for construction and demolition waste have been provided in **List of sites known to accept CDE waste** (Volume 6, Document Ref 6.4 ES Appendix 10.2) and Volume 6 Document Ref 6.3 ES Figure 10-1. Local sites would be used where possible and the following have been identified as suitable:
- Inert waste: Suez Recycling and Recovery UK Ltd, TR16 5HU – 7km from Chiverton Cross
 - Non-biodegradable wastes: Glebe Quarry Ltd, PL26 8JT – 23km from Carland Cross
 - Special: Biffa Waste Services Ltd, SN4 9QT – 315km from Carland Cross
- 10.11.27 The sensitivity of the off-site waste management infrastructure is considered to be **high** due to the region's need for further capacity as set out in the Local Plan. The total amount of non-hazardous CDE waste anticipated to arise is 23,340 tonnes which is 6% of the infrastructure capacity in the region of Cornwall, whilst the total amount of hazardous CDE waste anticipated to arise is 19,645 tonnes which is 1% of the infrastructure capacity in the South-West region. The magnitude of effect on off-site waste management infrastructure is therefore considered to be **moderate adverse**. The significance of effect is **slight/moderate adverse**.

Local road network

- 10.11.28 The sensitivity of the local road network is considered to be **high**. A haul road will be established by the Contractor throughout the site. It is assumed that the majority of the site won material will be moved within the site using the haul road rather than the existing A30, with plant crossings required on some of the side roads.
- 10.11.29 The movement of construction materials and waste to and from the site would require the use of the local road network, primarily the existing A30. It is assumed that all main bulk materials and waste will be delivered to and from site by HGVs

or equivalent. Access to the construction site and compounds would be off the associated side roads including the A390, B3284, A39, Allet Road, Shortlanesend Road and Pennycomequick Road.

10.11.30 Construction phase traffic data is not available at this stage and thus construction impacts associated with increased traffic and resulting air quality and noise impacts are not identified and it is not possible to quantitatively assess impacts on traffic during construction. In the absence of this available data and the absence of guidance for impacts on transport associated with materials, it has been assumed that construction traffic has the potential to result in significant impacts on the local road network. An Outline Traffic Management Plan (Volume 6 Document Ref 6.4 Appendix 2.1) has been produced which has identified the key areas where the works impact on the existing A30 traffic flow and solutions have been derived to phase the construction works in such a way as to minimise the disruption and impact on the travelling public. This will be developed by the contractor during detailed design and will contain measures for alleviating impacts on traffic flows through construction.

Strategic targets

10.11.31 The high level strategic targets set out in Table 10-2 have been assessed based on the outcomes of the assessment of construction impacts in the Environmental Statement when further information is available. The results are presented in Table 10-14.

10.11.32 The sensitivity of the targets is considered to be **low**. The scheme is not expected to impact on the targets ('**no change**') and thus the significance of impacts is **neutral**. The definition of significance as outlined in Table 10-6 does not provide for strategic targets as a receptor.

Table 10-14 Assessment of Strategic Targets

Policy document	Target	Preliminary assessment of scheme against target
EU Waste Framework Directive	Waste should be managed without endangering human health and harming the environment	The management of waste will be undertaken in accordance with standard pollution prevention guidelines.
	70% of C&D waste (excluding naturally occurring waste) should be prepared for re-use, recycling and recovery	Management of waste will be provided by the Contractor and set out in the Waste Management Plan. The waste strategy will be in accordance with the Waste Hierarchy. It is expected that the majority of waste will be reused on site, and that the 70% target will therefore be met.

Policy document	Target	Preliminary assessment of scheme against target
National Policy Statement for National Networks	Arrangements should be set out for managing any waste produced, including information on the proposed waste recovery and disposal system for all waste generated	Management of waste will be provided by the Contractor and set out in the Waste Management Plan. The waste strategy will be in accordance with the Waste Hierarchy. It is expected that the majority of waste will be reused on site.
National Planning Policy for Waste	The likely impact of proposed development on existing waste management facilities and areas allocated for waste management is acceptable and does not prejudice the implementation of the waste hierarchy/efficient operation of such facilities	Quantities of waste and proposed use of waste management facilities is expected to be minimal. Waste strategy will be outlined in the Waste Management Plan.
	The handling of waste arising from the construction and operation of development maximises reuse/recovery opportunities, and minimises off-site disposal	Quantities of waste and proposed use of waste management facilities is expected to be minimal. Waste strategy will be outlined in the Waste Management Plan.
Waste Prevention Programme for England 2013	Design should incorporate the removal of causes of waste early on	The design has taken into account waste reduction measures. Suitable material generated on site will be reused on site in earthworks or proposed localised landscape bunding and essential landscaping mitigation areas.
Cornwall Minerals Safeguarding Development Plan	To ensure the development doesn't adversely impact on Cornwall's minerals industry	There will be limited imported material required (approximately 10,000m ³) and this has been assessed against availability in Cornwall set out in the Local Plan.
Cornwall Local Plan	The likely impact of proposed development on existing waste management facilities and areas allocated for waste management is acceptable and does not prejudice the implementation of the waste	Quantities of waste and proposed use of waste management facilities is expected to be minimal. Waste strategy will be

Policy document	Target	Preliminary assessment of scheme against target
	hierarchy/efficient operation of such facilities	outlined in the Waste Management Plan.
National and regional guidelines for aggregates provision in England 2005-2020	Recycled content target (alternative materials) of 25%	The contractor will take into account the recycled content target when sourcing materials.

Operation Effects

10.11.33 The scheme has limited potential to generate an effect during the operational phase, as there are no requirements to import or export materials or to generate waste on a day to day basis.

10.11.34 Roads are subject to a periodic maintenance regime. DMRB Volume 7 Pavement Design and Maintenance requests that all new roads are built to a 40-year design life, which can only be achieved if the highway is maintained. Maintenance is needed using a 10 year cycle of interventions, which are likely to be:

- Year 10, minor intervention. Remove and replace the surface course;
- Year 20, major intervention. Remove and replace surface course, replace kerbs, upgrade drainage system. Replace road signs. Patch the binder and road base selectively.
- Year 30, minor intervention as year 10; and
- Year 40, major intervention as year 20.

10.11.35 The maintenance works would involve export of surface course planings and damaged kerbs etc. At this stage, the location for the disposal of these materials is not known, however, it is likely that road planings would be recycled and other materials processed off site for reuse. Import of materials would be required to replace the surface course and damaged kerbs etc. At this stage the source of these materials is not known, however, it is likely to be from local suppliers.

10.11.36 The import and export of construction materials during maintenance works would involve significantly lower quantities of materials than during construction and would therefore have a lower impact on source sites and sites receiving the material. The facilities are likely to be established facilities and are therefore considered to have a **low to medium** sensitivity. Subject to further investigation as part of the EIA, the quantities of materials would be relatively small and therefore the magnitude of impact is assessed to be **minor adverse**. The significance of effect from operation is therefore **slight adverse**. This is considered to be in general accordance with the definitions outlined in Table 10-5 whereby slight adverse effects result in a reduction or alteration in the regional capacity of waste and the waste infrastructure has sufficient capacity to accommodate waste from the scheme.

10.11.37 Based on the results of the assessment, Table 10-15 provides an overview of the potential impacts associated with each stage of the scheme.

Table 10-15 Detailed Assessment Reporting Matrix

Project Activity	Potential impacts associated with material resources/waste arisings	Description of the impacts
Site remediation/preparation	Generation of waste has the potential to result in impacts on off site waste management infrastructure	Minor adverse, potentially long-term, indirect
	Generation of waste has the potential to result in impacts on the local road network	Potential for adverse, short-term, indirect impacts
Demolition	Generation of waste has the potential to result in impacts on off site waste management infrastructure	Minor adverse, potentially long-term, indirect
	Generation of waste has the potential to result in impacts on the local road network	Potential for adverse, short-term, indirect impacts
Site construction	Import of materials has the potential to impact on off site secondary material sources	Slight adverse, short-term, indirect
	Demand for materials has the potential to impact on on site material management infrastructure	Neutral
	Import of materials and generation of waste has the potential to impact on the local road network	Potential for adverse, short-term, indirect impacts
	Generation of waste has the potential to result in impacts on off site waste management infrastructure	Slight/moderate adverse, short-term, indirect
Operation and maintenance of asset	No impacts are considered likely.	No impacts are considered likely.

10.12 Monitoring

10.12.1 Procedures would be adopted by the Contractor prior to construction to control the use of materials and further reduce the impact. This will be documented in the CEMP and the associated management plans. The SWMP will detail the estimated quantities of waste material and the opportunities for reuse, recycling, recovery or disposal.

10.12.2 Materials would be responsibly sourced (i.e. must have a certified provenance, traceability and sustainability) where possible, in order to reduce the impact on the highways network and material resources. Responsible sourcing is defined in BS8902 – Responsible sourcing sector certification schemes for construction projects – Specification as:

“the management of sustainable development in the provision or procurement of a product”

10.12.3 Where sustainable development is further defined as:

“an enduring, balanced approach to economic activity, environmental responsibility and social progress”.

10.12.4 In order to comply with responsible sourcing principles, the Contractor would, for example:

- Refer to standard BES 6001 - The Responsible Sourcing of Construction Products; and
- Ensure suppliers are certified by the Forest Stewardship Council (FSC) or Programme for the Endorsement of Forest Certification (PEFC).

10.13 Summary

- 10.13.1 The likely significance of environmental effects from the use of material resources, and the generation and management of waste, resulting from the construction and operation of the scheme are summarised in Table 10-16.
- 10.13.2 Where materials excavated on site are initially unable to meet the re use criteria they would either be treated to make them suitable for use or, as a last resort, disposed of off-site as waste. Effective treatment would be in the form of drying out of materials which is unlikely to need a licence, and would offset the need for imported material resources and minimise the requirements for disposal.
- 10.13.3 During the construction phase, standard best construction practice would be adopted. The CEMP will set out the controls for material storage.
- 10.13.4 This approach for managing materials is consistent with the waste hierarchy defined in the Waste Framework Directive (Directive 2008/98/EC). Adopting the waste hierarchy would significantly reduce the amount of material requiring off-site disposal and hence minimise potential impacts relating to movement of materials both on to and off the site.
- 10.13.5 The assessment demonstrates that the significance of adverse environmental effects with mitigation in place is generally **slight adverse**. However, during construction the generation of waste could result in, moderate adverse effects due to limited availability in the region. A detailed strategy following the waste management hierarchy will be set out in the SWMP to reduce the amount of material that would need to be disposed of off site.
- 10.13.6 During the operational phase there would be no significant effects anticipated associated with material resources.

Table 10-16 Summary of significance of effect

Receptor	Significance of effect
Primary Material Sources (on-site)	Neutral
Imported Material Sources (off site)	Neutral/Slight adverse
Construction Materials Management Infrastructure (on site)	Neutral
Construction Waste Management Infrastructure (off site)	Slight/moderate adverse
Local road network	Assumed adverse effects. Traffic Management Plan to mitigate effects.
Strategic Targets	Neutral

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