

Welsh Government

**A40 Llanddewi Velfrey to Penblewin
Improvements**

Environmental Statement Chapter 16: Materials

A40LVP-ARP-EGN-SWI-RP-LE-0001

P06 | S4

21/01/19

This report takes into account the particular instructions and requirements of our client. It is not intended for and should not be relied upon by any third party and no responsibility is undertaken to any third party.

Contents

	Page	
16	Materials	1
16.1	Introduction	1
	Material Resources	2
	Generation and Management of Waste	3
16.2	Legislation and Policy Context	4
16.3	Relevant Guidance	8
16.4	Study Area	8
16.5	Methodology	9
16.6	Significance Criteria	12
16.7	Limitations and Assumptions	14
16.8	Consultations	15
16.9	Baseline Environment	16
16.10	Potential Construction Effects	19
16.11	Potential Operation Effects	23
16.12	Assessment of Effects Summary	24
16.13	Mitigation and Monitoring	25
16.14	Residual Effects	27
16.15	Summary	28

Tables

Table 16.1	Environmental Value (or Sensitivity)	12
Table 16.2	Magnitude of Impact	13
Table 16.3	Significance of Effect	14
Table 16.4	Current mineral working	18
Table 16.5	Summary of materials resource use	20
Table 16.6	Summary of waste arisings	21
Table 16.7	Detailed Assessment Reporting Matrix	25
Table 16.8	Summary of mitigation measures	26

Figures (unless otherwise stated these are provided in Volume 2)

16.1	Waste Management Facilities
------	-----------------------------

16 Materials

16.1 Introduction

- 16.1.1 This chapter provides an assessment of the likely significance of environmental effects from the use of material resources and the generation and management of waste resulting from the Scheme.
- 16.1.2 It should be noted that the impacts on geology and soils, and the potential for land contamination, has been addressed in Chapter 6 Geology and Soils, of this Environmental Statement (ES).
- 16.1.3 The use of material resources and generation of waste has been estimated based on the requirements of the Key Stage 3 Scheme design as described in Chapter 2 The Project, of this ES.
- 16.1.4 For the purposes of this assessment, ‘Materials’ are defined as comprising:
- a) use of material resources; and
 - b) generation and management of waste.
- 16.1.5 The assessment focuses mainly on the construction phase of the proposed Scheme as this is primarily where potentially significant effects in relation to material resources and waste arisings would arise.
- 16.1.6 Operational impacts, in terms of resource use and waste generation, have been considered, however the impacts are dependent on the maintenance regime and the need to replace materials throughout the lifetime of the structure.
- 16.1.7 The assessment has been conducted in accordance with the guidance set out in the Design Manual for Roads and Bridges (DMRB) Interim Advice Note (IAN) 153/11 “Guidance of the Environmental Assessment of Material Resources”¹. The above IAN has not yet been adopted in Wales. However, it is considered that the IAN reflects current best practice guidance and as there is no suitable Welsh equivalent guidance, it has been used to inform the proposed method of assessment. It is acknowledged that references to the National Planning

¹ DMRB Interim Advice Note (IAN) 153/11 “Guidance of the Environmental Assessment of Material Resources”, 2011.

Policy Framework (NPPF) set out in the above IAN is not relevant in the Welsh context.

- 16.1.8 The estimated cost for the proposed Scheme is greater than the £300,000 threshold included in the guidance. Therefore, it is assumed that potential exists for environmental impacts and effects from the use of materials and generation of waste. As a minimum, a Simple Assessment is therefore required in accordance with IAN 153/11.
- 16.1.9 The Scoping Report recommended that a Simple Assessment would be appropriate, and dependent on the outcome of this assessment, a Detailed Assessment may also be required in accordance with IAN 153/11. A Simple Assessment has been completed and supplemented by a Detailed Assessment.
- 16.1.10 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 the following:
- a) types and quantities of material resources associated with the construction and operational phases of the Scheme;
 - b) types and quantities of waste arisings associated with the construction and operational phases of the Scheme; and
 - c) movement of materials during construction (both to and from the site).
- 16.1.11 It is outside the scope of the guidance to assess the environmental impacts associated with the extraction of raw materials and the manufacture of products which occur off-site. The guidance recognises that these stages of a material's life cycle are likely to have already been subjected to an environmental assessment. These impacts are therefore not addressed in this ES chapter.

Material Resources

- 16.1.12 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, would arise on-site.
- 16.1.13 Road schemes require significant 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, have the potential to affect the environment adversely. The key impacts associated with the use and consumption of material resources in relation to the proposed Scheme are addressed in Sections 16.11 and 16.12. The consumption of significant quantities of material resources is likely to result in indirect and direct impacts on the environment which includes embodied carbon emissions associated with a number of stages in the material resource's life cycle.

Generation and Management of Waste

- 16.1.14 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.
- 16.1.15 Material excavated and reused within the Scheme area / planning boundary is not classed as waste, subject to it being suitable for its intended use.
- 16.1.16 The EU Waste Framework Directive (Directive 2008/98/EC) 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.
- 16.1.17 Waste for disposal is classed as hazardous, non-hazardous or inert, depending on the level of harm to human health and/or the environment.
- 16.1.18 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 other measures required by the Directive.
- 16.1.19 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. The effects of the Scheme may also impact on relevant waste policies and plans.

16.2 Legislation and Policy Context

16.2.1 This section identifies the legislation and policies that are relevant to material resources and waste arisings.

EU Waste Framework Directive 2008/98/EC

16.2.2 The overarching policy in relation to the handling of material resources along the Scheme is the EU Waste Framework Directive 2008/98/EC. This provides the framework legislation for the collection, transport, recovery and disposal of waste. It 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.

16.2.3 The overall purpose of the Waste Framework Directive is to set out measures to protect the environment and human health by preventing or reducing the adverse effects of waste generation and its management, and by improving the efficiency of resource use. Member States are required by the Directive to take all the necessary measures to ensure that waste is recovered or disposed of without endangering human health or causing harm to the environment.

16.2.4 The Directive sets a number of high-level objectives, which have influenced national waste management policy and legislation. In particular, Article 11 of the Waste Framework Directive (amended in 2008) requires that Member States take the necessary measures to achieve 70% recycling of non-hazardous construction and demolition waste by 2020.

The Waste (England and Wales) Regulations 2011 (as amended)

16.2.5 Directive 2008/98/EC has now been transposed in Wales by the Waste (England and Wales) Regulations 2011 (S.I. 2011 No. 988) (as amended). In Wales, the Regulations are supplemented by the Waste (Miscellaneous Provisions) (Wales) Regulations 2011 (S.I. 2011 No. 971 (W.141)). The latter Regulations make a number of consequential amendments to several Welsh Statutory Instruments and revoke one Wales-only instrument (i.e. the Environmental Protection (Duty of Care) (Amendment) (Wales) Regulations 2003).

16.2.6 In addition to the above, reference has been made to the following legislation relating to material resources and waste management:

- a) The Controlled Waste (England and Wales) Regulations 2012.
- b) The Hazardous Waste (England and Wales) Regulations 2005.

The Well-being of Future Generations (Wales) Act 2015

- 16.2.7 The act strengthens existing governance arrangements for improving the well-being of Wales to ensure that present needs are met without compromising the ability of future generations to meet their own needs. The act requires all public bodies to embed climate change into their decision making. Chapter 16 Materials particularly relates to objective 12: Manage, use and enhance Wales' natural resources to support long term well-being.

Environment (Wales) Act Part 1: "Sustainable management of natural resources" 2016

- 16.2.8 The Environment (Wales) Act includes features that would ensure that managing natural resources sustainably would be a core consideration in decision making. Part 1: "Sustainable management of natural resources" provides a modern legislation for managing Wales's natural resources, which helps to tackle the challenges faced and is focused on the opportunities resources provide.

The Environmental Permitting (England and Wales) Regulations 2016

- 16.2.9 The recovery and disposal of waste requires a permit under EU legislation with the principle objective of preventing harm to human health and the environment.

National Policy: Planning Policy Wales (Edition 10), December 2018

- 16.2.10 Planning Policy Wales (PPW) presents Welsh Government's land use policy, which should be taken into account when preparing development plans. The policy sets out Welsh Government's objectives in terms of waste management. The main focus of the policy is the provision of future waste management facilities by local planning authorities. However, it promotes design choices to prevent waste and opportunities to reduce or recycle waste as part of design and construction.
- 16.2.11 Further to this, PPW encourages materials balance on site and the use of renewable resources, including sustainable materials (recycled and

renewable materials and those with a lower embodied energy). Where it is judged necessary to use non-renewable resources they should be used as efficiently as possible. The use of renewable resources and of sustainably produced materials from local sources should be encouraged, with recycling and reuse levels arising from demolition and construction maximised, and waste minimised.

- 16.2.12 PPW also encourages the efficient use of minerals by promoting the appropriate use of high quality materials, and by minimising the production of waste through maximising the potential for reuse and recycling waste, where environmentally acceptable.

National Policy: Towards Zero Waste, One Wales: One Planet 2010 (Welsh Assembly Government, 2010)

- 16.2.13 Towards Zero Waste (TZW) was published in 2010 and is the overarching waste strategy document for Wales. TZW sets out a high-level strategy for how Welsh Government will manage waste in Wales to produce benefits not only for the environment, but also for the economy and social well-being. The strategy and its associated sector plans outline the actions Wales must take to reach the ambition of becoming a high recycling nation by 2025 and a zero-waste nation by 2050. Achieving the aims in TWZ relies on a suite of waste sector plans. These provide details on how the outcomes, targets and policies in Towards Zero Waste are to be implemented.

National Policy: Welsh Government (2012) Construction and Demolition Sector Plan

- 16.2.14 This plan details outcomes, policies and actions on waste for organisations, companies and individuals in Construction and Demolition (C & D) in Wales.

Technical Advice Note 21: Waste, 2014

- 16.2.15 Technical Advice Note 21: Waste provides advice on how the land use planning system should contribute towards sustainable waste management and resource efficiency.

Minerals Technical Advice Note (Wales) 1: Aggregates

- 16.2.16 Minerals Technical Advice Note (Wales) 1: Aggregates sets out detailed advice on the mechanisms for delivering the policy for aggregates extraction by mineral planning authorities and the

aggregates industry. Its aim is to ensure mineral resources are used sustainably whilst meeting society's needs. It should be read in conjunction with Minerals Planning Policy Wales which sets out the general policies for all mineral development.

WRAP Cymru Delivery Plan: 2011-15 For a World Without Waste

- 16.2.17 This plan focuses on the most important issues: minimising resource use and diverting priority materials from landfill. The Plan is divided into two themes: waste prevention and resource minimisation (including reuse), recycling and recovery (including preparation for reuse).

Climate Change Strategy for Wales 2010

- 16.2.18 Chapter 12 within this strategy, "Resource efficiency and waste sector emission reduction", sets out actions to reduce emissions in the waste sector including:
- a) Reducing greenhouse gas emissions from landfill sites.
 - b) Reducing indirect emissions associated with resource consumption by increasing reuse, recycling and composting.

Pembrokeshire County Council Local Development Plan (LDP)

- 16.2.19 Pembrokeshire County Council LDP², Adopted Plan (February 2013) provides policies on sustainable development (Strategic Policy 1), safeguarding mineral resources (Strategic Policy 6) and waste (Strategic Policy 11). A number of General Policies (GN) relate to materials and waste, including:
- a) GN.4 Resource Efficiency.
 - b) GN.22 Prior Extraction of the Mineral Resource³ provides supplementary good practice guidance.
 - c) GN.23 Mineral Working.
 - d) GN.24 Recycled Waste Materials and Secondary Aggregates.
 - e) GN.40 New Waste Management Facilities.
 - f) GN 24 Recycled Waste Materials and Secondary Aggregates.
 - g) GN.41 Waste Minimisation, Reuse, Recovery, Composting and Treatment.

² <https://www.pembrokeshire.gov.uk/content.asp?nav=1626,109,2045>

³ Good Practice Guidance Note – LDP policy GN.22 – prior extraction of the mineral resource.

- h) GN.42 Disposal of Waste on Land.

16.3 Relevant Guidance

16.3.1 The following relevant published standards, guidance and best practice would be followed.

- a) Interim Advice Note (IAN) 125/15 Supplementary Guidance for Users of DMRB Volume 11 ‘Environmental Assessment Update’.
- b) Design Manual for Road and Bridges (DMRB) Volume 11, Section 3 Part 3, Disruption Due to Construction. This covers the effect on people and on the natural environment which can occur, mainly during construction works.
- c) DEFRA Environmental Permitting Guidance ‘The Waste Framework Directive’ for the Environmental Permitting (England and Wales) Regulations 2010.
- d) Definition of Waste: Development Industry Code of Practice, Version 2 (Contaminated Land: Applications in Real Environments (CL:AIRE) 2011).
- e) Pollution Prevention Guidelines (PPG) ‘Working at construction and demolition sites’ provides 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. Although PPG6 was withdrawn on 14 December 2015 and is no longer maintained by the Environment Agency et al., such guidance continues to provide useful pollution prevention guidance for site activities.

16.4 Study Area

16.4.1 The study area for the assessment includes the construction and permanent land take areas associated with the Scheme (see Volume 2 Figures 2.4A and 2.4B) plus the spatial area over which the Scheme would be predicted to have an effect.

16.4.2 Consideration of the potential effects outside of the Scheme area has also been included where appropriate, specifically with regards to the effects associated with the supply and movement (import/export) of material resources and export of waste arisings outside of the Scheme boundary. For material resources and waste arisings, the study area would typically relate to the region, in this case South West Wales.

16.5 Methodology

- 16.5.1 The assessment of the environmental effects associated with the use of material resources, the generation and management of waste resulting from the construction of the Scheme has been undertaken in accordance with the guidance provided within the IAN 153/11 – Guidance on the Environmental Assessment of Material Resources.

Baseline Methodology

- 16.5.2 The existing baseline conditions were identified from desk studies and information from ground investigations. This information was used to determine the nature of existing material resources on site that will be used in the earthworks. The potential locations of material resource sources, disposal and management sites were also reviewed.

Ground Conditions

- 16.5.3 The baseline ground conditions within the study area were established through desk studies and intrusive ground investigations.
- 16.5.4 The following sources of information were used to assess baseline ground conditions:
- a) 1:50,000 Geological Plan, Sheet 228 Haverfordwest (Drift) 1976, British Geological Survey.
 - b) 1:50,000 Geological Plan, Sheet 228 Haverfordwest (Solid) 1976, British Geological Survey.
 - c) A40 Llanddewi Velfrey to Penblewin Improvement – Preliminary Sources Study Report, March 2016, Mott MacDonald.
 - d) A40 Llanddewi Velfrey to Penblewin – Ground Investigation Factual Report, June 2016, WYG Environment Planning Transport Ltd.
 - e) A40 Llanddewi Velfrey to Penblewin Improvement – Ground Investigation Report, June 2017, Arup.
 - f) A40 Llanddewi Velfrey to Penblewin – Geotechnical Design Report, August 2017, Arup.

Mineral Resources

- 16.5.5 The following published maps were reviewed to establish the presence of mineral resources within the Scheme area and wider study area:

- a) British Geological Survey 1:100,000 South West Wales Mineral Resource Map.
- b) British Geological Survey 1:100,000 South West Wales Aggregate Safeguarding Map.
- c) Pembrokeshire County Council (2013) LDP up to 2021.

Waste Management Facilities

16.5.6 Searches were undertaken to establish the location of suitable waste management facilities. The following sources were reviewed:

- a) Natural Resources Wales Public Register of Operational Waste Management Facilities was reviewed based on information downloaded from the Lle Geo-Portal⁴.
- b) Pembrokeshire County Council (2013) LDP up to 2021.

Assessment of Construction Effects

16.5.7 The assessment aims to identify the environmental effects associated with material resource demand and waste arisings through a review of the resources required for the construction phase of the Scheme and the waste that is likely to arise.

16.5.8 A Simple Assessment has been carried out in accordance with IAN 153/11.

16.5.9 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 may result in the need for Detailed Assessment.

16.5.10 For the purposes of assessing the effects associated with material resource use and waste arisings, the Simple Assessment is a qualitative exercise which aims to identify the following:

- a) The material resources required for the project and where information is available, the quantities.
- b) The anticipated waste arisings from the project, and where information is available, the quantities and type (e.g., inert, hazardous).

⁴ Lle Geo-Portal <http://lle.gov.wales/home?lang=en>

- c) The impacts that will arise from the issues identified in relation to material resources and waste.
- d) The results of any consultation.
- e) A conclusion about whether this level of assessment is sufficient to understand the effects of the project or whether a Detailed Assessment is necessary.

16.5.11 The assessment identifies the environmental impacts and the measures to mitigate the impacts. The assessment of potential effects due to construction was based on estimated material resource requirements and includes a review of material volumes, sources and movements. Vehicle movements required for delivery and export of materials were considered.

16.5.12 The outcome of the Simple Assessment was that a Detailed Assessment was required. The Detailed Assessment is a quantitative assessment and was completed in accordance with IAN 153/11. It used the data gathered at the Simple Assessment level along with additional information collated to quantify the material resources required for the project and the estimated quantities and types of waste that would be produced.

16.5.13 As noted in IAN 153/11, the guidance is not exhaustive and thus provides a flexible approach which enables the tailoring of the approach to the specific characteristics of each project. For the purposes of assessing the effects associated with material resources and generation and management of waste arisings in this Scheme, the Detailed Assessment is a quantitative exercise.

Assessment of Operational Effects

16.5.14 The environmental effects associated with material resource demand, and the generation and management of waste arisings during operation are generally limited to those associated with periodic maintenance.

16.5.15 For the assessment of potential operational effects, the periodic maintenance requirements presented in Volume 7 of DMRB have been considered. A qualitative assessment has been carried out of the sensitivity of the facilities required to source necessary material resources and facilities required for waste disposal. The impact on these facilities has been based on the scale and nature of the periodic maintenance work.

16.6 Significance Criteria

16.6.1 There is currently no specific defined methodology for assessing the environmental significance of a material resource or for determining the magnitude of the impact on such a resource. Similarly, there is no specific methodology for assessing that of the generation and management of waste arisings. The general guidance given in DMRB Volume 11, Sections 1 and 2 was therefore considered. In particular, the guidance in Volume 11, Section 2, Part 5 (HA 205/08) together with professional judgement was used to assess environmental value, magnitude of impact and the significance of environmental effects.

Sensitivity

16.6.2 The first stage of the assessment is an evaluation of the sensitivity of the material resource or feature, based on an assessment of the quality, scale, rarity and the services provided. The value (sensitivity) of the material resources or waste arisings and management facilities within the study area is determined on the basis of the descriptions described in Table 11.1 of HA 205/08 as reproduced below in Table 16.1.

Table 16.1 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.

Magnitude of Impact

16.6.3 The second stage is an evaluation of the magnitude of impact that the proposed works are likely to have on the resource or feature. The magnitude of the impact has been determined on the basis of the descriptions derived from Table 11.2 of the HA 205/08 as reproduced in Table 16.2 below.

Table 16.2 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.

Significance of Effects

16.6.4 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 has been derived in accordance with Table 2.4 of HA205/08 as reproduced in Table 16.3 below.

Table 16.3 Significance of Effect

Value/ Sensitivity	Magnitude of Impact				
	No Change	Negligible	Minor	Moderate	Major
Very High	Neutral	Slight	Moderate or large	Large or Very large	Very large
High	Neutral	Slight	Slight or moderate	Moderate or Large	Large or Very large
Medium	Neutral	Neutral or slight	Slight	Moderate	Moderate or Large
Low	Neutral	Neutral or slight	Neutral or slight	Slight	Slight or moderate
Negligible	Neutral	Neutral	Neutral or slight	Neutral or slight	Slight

16.7 Limitations and Assumptions

16.7.1 The following limitations and assumptions have been noted.

- a) The assessment of material resources and generation and management of waste arisings is still a developing area; detailed guidance is therefore not yet available on some aspects of the assessment process. This limitation has been considered and IAN 153/11 has formed the basis for the assessment.
- b) The construction and operation of the Scheme would be carried out in accordance with normal good working practice implemented on such projects. The Preliminary Construction Environmental Management Plan (CEMP) sets out the environmental measures that would be adopted during the construction phase. This is provided in Volume 3 Appendix 2.2 of the ES and would form the basis of the full CEMP prior to construction commencing.
- c) The quantities of material resources to be used for the construction of the Scheme, the sources from where they would be obtained and their mode of transport is yet to be finalised; they are estimated based on the Scheme design as described in Chapter 2 The Project. The quantities of the waste likely to arise were estimated on this basis. It is anticipated that the quantities would not be significantly different, and therefore would not produce a greater magnitude of impact.
- d) The final quantities of material resources to be used for construction of the Scheme, the sources from where they would be

obtained and their mode of transport would be further reviewed during detailed design to ensure overall best value.

- e) Whilst limitations exist, it is considered that the assessment of material resources and waste arisings is sufficiently robust according to the guidelines set out in the IAN 153/11 and for the purposes of this ES.

16.7.2 A Site Waste Management Plan (SWMP) would be prepared for the Scheme as part of the CEMP; refer to Chapter 22 Management of Environmental Effects. This would be implemented by the Contractor during construction. The SWMP would set out how the resulting waste would be managed during the construction of the Scheme. As SWMPs are not a legal requirement in Wales, this would be undertaken to provide supporting information on the basis of best practice. An outline SWMP is provided within the Preliminary CEMP which is contained in Appendix 2.2 of the ES.

16.7.3 Related guidance for the SWMP includes the following by Waste & Resources Action Programme (WRAP):

- a) WRAP SWMP template; and
- b) WRAP Designing out Waste: a design team guide for Civil Engineering.

16.7.4 A Materials Management Plan (MMP) would be prepared for the Scheme as part of the CEMP. This would also be implemented by the Contractor during construction and would set out how materials would be managed during the construction of the Scheme.

16.8 Consultations

16.8.1 Consultation with Natural Resources Wales (NRW) and Pembrokeshire County Council (PCC) was undertaken through the submission of the draft Scoping Report, in discussions at the ELG meetings and by direct correspondence.

16.8.2 NRW were asked for baseline information relating to historical and licenced landfills, and licenced waste management facilities (including soil treatment hubs / recycling centres) in Pembrokeshire and Carmarthenshire. Web links to the relevant pages of the Lle database were provided.

- 16.8.3 PCC were asked for baseline information relating to details of aggregate resources within the county (land bank figures) and local waste management infrastructure within the county. The council responded with references to specific appendices of the LDP.

16.9 Baseline Environment

Ground Conditions

- 16.9.1 Details relating to the geology and soils within the study area are presented in Chapter 6 Geology and Soils. A brief summary of key aspects is provided below. The Arup Ground Investigation Report (GIR)⁵ (enclosed in Volume 3 Appendix 6.3) provides more details regarding detailed descriptions of the below-mentioned formations.

Superficial Deposits

- 16.9.2 Published geological maps show no superficial deposits across the majority of the proposed Scheme area. Localised areas of glaciofluvial deposits, boulder clay and alluvium are shown to be present.
- 16.9.3 Topsoil was encountered in the majority exploratory hole locations directly overlying the bedrock. Made-ground materials were also encountered locally within the scheme area.
- 16.9.4 Although shown locally on the geological maps, glaciofluvial deposits, boulder clay and alluvium were not encountered by the ground investigations.

Bedrock

- 16.9.5 The bedrock beneath the Scheme comprises three formations: primarily the Slade and Redhill Formation in the east and the Haverford Mudstone Formation with some discrete areas of the Portfield and Haverford Formation in the west.
- 16.9.6 As described in the Geotechnical Design Report⁶, the materials excavated from the cuttings are expected to be predominantly granular in nature, which are likely to break down easily under processing and compaction to a Class 1 material in grading. However, a mantle of

⁵ Welsh Government, A40 Llanddewi Velfrey to Penblewin Improvements, Ground Investigation Report, ref. A40LVP-ARP-VGT-SWI-RP-C-0001, Arup, July 2017

⁶A40 Llanddewi Velfrey to Penblewin – Geotechnical Design Report, August 2017, Arup.

mudstone rock along some lengths of proposed cutting are likely to have weathered down to a clay and would comprise a Class 2 material in grading.

Material Resources

- 16.9.7 The scheme would require both mineral resources, such as stone and soil, and manufactured construction material resources such as concrete, bricks, wood, bituminous macadam and steel. Access to mineral resources within the Scheme areas is discussed in Chapter 6 Geology and Soils. This chapter discusses the mineral resources available in the region surrounding the Scheme.
- 16.9.8 The imported manufactured material resources 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, material resources would be provided from local sources. The sensitivity of the imported manufactured material resources is thus considered to be low.
- 16.9.9 The Mineral Landbank Calculations Summary Statement for PCC, LDP, Adoption – 2021, Revision (position at July 2012)⁷ describes the Welsh Government landbank requirements of a minimum of 10 years for hard rock and a minimum of seven years for sand and gravel, for the entire period of the Council’s LDP period.
- 16.9.10 It is stated that Pembrokeshire’s current (2012) hard rock landbank is 38.32 years (excluding the National Park) – sufficient for 28.82 years at the end of 2021.
- 16.9.11 The Mineral Landbank Calculations show that there is currently no landbank of sand and gravel and thus the Welsh Government requirements are not met. However, an in-principle agreement was made between PCC and the Pembrokeshire Coast National Park Authority which allows the County to take account of permitted reserves within the National Park so that a Pembrokeshire wide landbank calculation can be used for the PCC LDP. This being the case, the combined landbank for hard rock would decrease slightly to 36.47

⁷The Mineral Landbank Calculations Summary Statement for Pembrokeshire County Council, Local Development Plan (LDP), Adoption – 2021, Revision (position at July 2012).

years (sufficient for 26.97 years at the end of 2021) but the current combined landbank for Sand and Gravel would increase to 17.86 – sufficient for 8.36 years at the end of 2021.

16.9.12 The current mineral workings within the Pembrokeshire LDP area are summarised in Table 16.4 below.

Table 16.4 Current mineral working

Name	Mineral	Status
Blaencilgoed / Gellihalog	Limestone	Active
Bolton Hill	Igneous	Active
Slade Hall Farm	Mudstone	Active
Glogue	Slate	Active
Cotts Lane	Slate	Active
Penlan	Slate	Active
Cefn	Slate	Active
Plascwrt	Sandstone	Active
Pope Hill	Shale	Active
Tangiers Farm	Shale	Active
Cronllwyn	Slate waste	Planning permission granted and working recently commenced
Treffgarne	Igneous	Dormant
Gilfach for owners' personal use	Slate	Small-scale working
Yetwen	Sandstone	Dormant
Trefgin133 (the part of the site outside the National Park)	Sand and gravel	Planning permission M15 granted, but working not commenced

16.9.13 There is also a wharf for landing of marine-won sand and gravel at Pembroke Dock.

16.9.14 It is considered that the hard rock landbank in Pembrokeshire is sufficient to support demand and is therefore considered to have a low sensitivity.

Waste Management Facilities

- 16.9.15 The waste management facilities⁸ located within approximately 30km of the Scheme are deemed suitable for disposal of waste (based on their waste activity type) are shown on Volume 2 Figure 16.1.
- 16.9.16 The South West Wales Regional Waste Plan 1st Review (August 2008)⁹ looks at waste across South West Wales (including Pembrokeshire CC, Pembrokeshire NPA, Bridgend CBC, Brecon Beacons NPA, Carmarthenshire CC, Ceredigion CC, Neath Port Talbot CBC and City & County of Swansea). The review states that in 2003, estimated regional arisings of C&D waste were 1,754,920 tonnes and by 2012/2013 they would stabilise at 2,076,883 tonnes.
- 16.9.17 There is likely to be availability in waste management facilities in the region. This will be confirmed during Detailed Design. The sensitivity is thus considered to be low to medium.

16.10 Potential Construction Effects

- 16.10.1 This section assesses the potential impacts of the material resources used and waste generated during the construction phase.
- 16.10.2 The Scheme has the potential to generate local effects during the construction and operational phase. This is due to:
- The requirement for the import of construction materials (including primary aggregates).
 - The generation of excess materials requiring removal from site to alternative sites or landfill.
 - Depletion of construction material and waste management facility resource.

Types and quantities of materials

- 16.10.3 A variety of different material resources would be required for the construction phase of the Scheme. The Scheme would be designed, as close as possible achieve a cut fill balance, and to prevent, where possible, the generation of waste arisings and the import of construction

⁸ Lle Geo-Portal <http://lle.gov.wales/home?lang=en>

⁹ South West Wales Regional Waste Group, South West Wales Regional Waste Plan 1st Review (August 2008)

materials by reusing or recycling the available existing material resources along the Scheme.

16.10.4 Where possible, site won material would be reused for the earthworks, however, some materials would be unsuitable for reuse. Other materials cannot be sourced on site and would need to be imported. As is the case with other highway schemes, at this stage it is not possible to confirm the specific sources for imported materials or disposal sites. This will be confirmed during Detailed Design.

16.10.5 A summary of the predicted material resource use is presented in Table 16.5 and a summary of the predicted waste arisings is presented in Table 16.6.

Table 16.5 Summary of materials resource use

Project Activity	Material resources required for the project	Quantities of material resources required	Additional information on material resources
Earthworks	Topsoil	Some 38,500m ³ * of topsoil would be reused*	Sourced from site
	General fill for embankments – primary or secondary / recycled materials	Some 313,500m ³ * of material would be reused in earthworks	Sourced from site
	Capping	Some 8,000m ² * of granular selected fill would be used as Capping	Sourced from local suppliers
Installation of pavement	Type 1 subbase	25,500m ³ *	Sourced from local suppliers
	Base, binder, and surface course. Primary or Secondary / Recycled materials	15,500 m ³ *	Sourced from local suppliers
Structures	Concrete	TBC	Local batching plants
Installation of manufactured products	Drainage, kerbs, trees, traffic signs, lighting etc.	Various quantities relative to road length and necessary safety measures	To be established local/national suppliers
Operation of the road	No significant material resources required	No significant material resources required	

* Please note that these figures are based on estimates made at the current preliminary design stage.

Table 16.6 Summary of waste arisings

Project Activity	Waste arisings from the project	Quantities of waste arisings	Additional information on waste arisings
Site clearance	Vegetation surface strip, kerbs, trees, traffic signs, lighting etc.	Quantities not available at this stage.	Likely to be a combination of locally recycled, disposal at an inert or non-hazardous landfill site.
Earthworks	Excess Topsoil	20,000m ³	To be used in landscaping where possible. If necessary, likely to be local recycling facilities.
	Surplus excavated material (acceptable and unacceptable materials)	Nil	It is anticipated that the earthworks part of the balance would be neutral. This is considered to be achievable provided that the excavated materials are suitably excavated and stockpiled for reuse.
Installation of pavement	Surface planings	Tie-ins at both ends of the Scheme.	Potential to be reused for access tracks to attenuation ponds and private means of access tracks.
Installation of manufactured products	No significant waste arisings.	No significant waste arisings.	
Operation of the road	No significant waste arisings.	No significant waste arisings.	

*Please note that these figures are based on the estimates made at the current preliminary design stage.

Materials resource use

16.10.6 As presented in Table 16.5, sufficient quantities of material resources can be won from site for use as general fill for embankments and topsoil. Selected granular fill materials for use as capping, subbase and bound pavement materials are highly unlikely to be able to be sourced on site and would need to be imported. Manufactured goods including drainage, kerbs, trees, traffic signs, lighting etc. would also require importing.

16.10.7 The import of capping and subbase construction material resources may have an impact on material sources. However, the likely sources of construction material resources are established local suppliers and as

discussed in the Section 16.10, the hard rock landbank in Pembrokeshire is sufficient to support demand and is therefore considered to have a low sensitivity. The quantities of the material resources required for construction are considered to have a minor magnitude of impact on the resources available to established suppliers. The significance of effect from construction is therefore neutral or slight.

- 16.10.8 Bound pavement materials and manufactured goods are likely to be sourced from established suppliers and are therefore considered to have a low sensitivity. The quantities of the common construction material resources required for construction are relatively small in the context of the material suppliers and therefore the magnitude of impact is assessed to be minor. The significance of effect from construction is therefore neutral or slight.

Waste

- 16.10.9 It is proposed that all materials arising from construction would be managed in accordance with the waste hierarchy defined within the Waste Framework Directive.
- 16.10.10 Site clearance would include clearing existing trees, safety barriers, concrete kerbs, lighting columns, and traffic signs. It is likely that the materials would be segregated and appropriately recycled on site or disposed of at an appropriate waste handling facility.
- 16.10.11 Earthworks estimates predict a balance of the majority of earthworks materials but a surplus of some 20,000m³ of topsoil. If removal of materials from site is required, the location for the disposal of these materials may include a combination of local recycling facilities and potentially disposal at an inert or non-hazardous landfill site. It is anticipated that a local recycling facility would be favoured.
- 16.10.12 It is proposed that all materials/waste arisings from construction would be reused on site in accordance with the waste management hierarchy defined within the waste framework directive. There may be some waste arisings associated with the works which cannot be reused on site. This may include waste arisings generated from the demolition of Trefangor Cottage, and any existing drainage infrastructure which would be replaced. The export of excess construction materials may have an impact on sites receiving the waste arisings. The facilities to

which waste arisings would be taken are likely to be established recycling facilities or landfill sites which have a low to medium sensitivity. The quantities of excess waste arisings requiring disposal are relatively small and would be a very small proportion of the overall construction and demolition waste disposal in the region, therefore the magnitude of impact is assessed to be minor. The significance of effect from construction is therefore slight.

- 16.10.13 Construction would include milling the surface of the existing pavement at the tie-ins with the existing highway. The surface planings could be reused in access tracks to attenuation ponds and private means of access tracks, which would result in no impact on material resources.

Local Road Network

- 16.10.14 The impact of vehicle movements associated with construction has been considered. The Scheme is in a heavily trafficked area, with over 11,000 vehicles using the existing road per day, and the import and export of construction material resources would result in additional traffic. Due to the current volume and type of traffic use, the sensitivity of the local road network is considered to be medium. As presented in Table 2.6 of Chapter 2 The Project, it is estimated that the import of bulk material would result in an average of 28 truck movements per day throughout the duration of the programme. This would include the import of drainage stone, concrete, subbase and pavement materials.
- 16.10.15 In addition to the bulk materials, there would be miscellaneous deliveries for items such as ducting, street lighting etc. There would also be export of waste arisings from site, although the quantities would be relatively small. Given the number of vehicles required for the import and export of material resources in comparison to the total number of vehicles using the existing road daily (amounting to 0.25%), it is considered that the magnitude of effect would be minor. The significance of effect from construction is therefore slight.

16.11 Potential Operation Effects

- 16.11.1 The Scheme has limited potential to generate an effect during the operational phase, as there are no requirements to import or export material resources or to generate waste on a day-to-day basis.

- 16.11.2 Roads are subject to a periodic maintenance regime. Volume 7 of DMRB 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:
- a) Year 10, minor intervention. Remove and replace the surface course.
 - b) Year 20, major intervention. Remove and replace surface course, replace kerbs, upgrade drainage system. Replace road signs. Patch the binder and road base selectively.
 - c) Year 30, minor intervention as year 10.
 - d) Year 40, major intervention as year 20.
- 16.11.3 The maintenance works would involve export of surface course planings and damaged kerbs etc. At this stage, the location for the disposal of these waste arisings 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 material resources is not known, however, it is likely to be from local suppliers.
- 16.11.4 The import and export of construction material resources during maintenance works would involve quantities of materials that are extremely small compared to those for 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. The quantities of material resources would be relatively small and therefore the magnitude of impact is assessed to be minor. The significance of effect from operation is therefore slight.

16.12 Assessment of Effects Summary

- 16.12.1 Table 16.7 provides an overview of the potential impacts associated with each stage of the Scheme. This is in accordance with IAN 153/11 which requires, as a minimum, an overview of whether the impacts are positive/negative, permanent/temporary and direct/indirect.

Table 16.7 Detailed Assessment Reporting Matrix

Project Activity	Potential impacts associated with material resources / waste arisings	Description of the impacts
Site preparation and construction	Import of subbase and capping.	Permanent, neutral or slight Adverse to off-site sources.
	Import of pavement material and manufactured products.	Temporary, neutral or slight Adverse to established suppliers.
	Generation of waste and associated impacts on off-site waste management infrastructure.	Permanent, slight Adverse to recycling/disposal sites.
	Transportation of material resources and waste.	Temporary, slight Adverse to traffic
Operation and maintenance of asset	No significant impacts anticipated	No significant impacts anticipated

16.13 Mitigation and Monitoring

- 16.13.1 The assessment of effects during construction and operation predicts a slight impact on material resources and generation and management of waste. Procedures would be adopted by the Contractor prior to construction to control the use of material resources and further reduce the impacts. The relevant procedures shall be documented in the Contractor's SWMP and MMP for the works.
- 16.13.2 Wherever possible, site won material resources should be reused in construction. Site won material resources 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 acceptable material to be used in construction would be developed, in accordance with the Specification for Highway Works (SHW)¹⁰. A specification would set material testing requirements for construction to confirm whether the proposed materials meet the requirements which have been developed in line with the CL:AIRE Code of Practice.
- 16.13.3 It would be necessary to remove some unacceptable and excess materials from site. A SWMP would be produced to detail the estimated quantities of waste arisings and the opportunities for reuse, recycling,

¹⁰ Manual of Contract Documents for Highways Works (MCHW), Volume 1 Specification for Highway Works (SHW).

recovery or disposal. An outline SWMP is provided within the Pre-CEMP contained in Appendix 2.2.

16.13.4 Materials would be sorted and/or processed, and where necessary treated, before reuse or disposal. This would limit the overall quantities disposed to landfill and maximise disposal to the most appropriate waste stream. The pre-treatment of waste material prior to disposal to landfill is a requirement of the waste regulations. By minimising the quantity of materials/waste arisings to be disposed offsite the associated vehicle movements would be minimised.

16.13.5 Due to the relatively simple nature of the construction processes involved, the small number of different types of potential surplus materials, and relatively small quantities of these, preparation and use of a SWMP is likely to be an effective approach to the mitigation of potential effects.

16.13.6 Table 16.8 summarises the mitigation measures that would be implemented.

Table 16.8 Summary of mitigation measures

Project Activity	Potential impacts associated with material resource use/ waste management	Description of mitigation measures	How the measures would be implemented, measured and monitored
Site clearance.	Waste disposal.	Identify opportunities for reuse, recycling, recovery.	Materials to be sorted, and where practical disposed to recycling facilities. Site SWMP to implement, measure and monitor.
Earthworks.	Use of primary resources. Waste disposal.	Reuse of materials in earthworks. Limit disposal and movements.	Design to maximise the earthworks balance. SWMP to implement, measure and monitor.
Pavement planings.	Waste disposal.	Possible reuse in access tracks.	Design to maximise the materials balance. SWMP to implement, measure and monitor.

Monitoring

16.13.7 Procedures would be established by the Contractor prior to construction to control the use of materials and further reduce the impact. These

would be documented in the SWMP for the Scheme which would form part of the CEMP. The SWMP would detail the estimated quantities of waste arisings and the opportunities for reuse, recycling, recovery or disposal.

- 16.13.8 Material would be responsibly sourced (i.e. must have a certified provenance, traceability and sustainability) where possible, to reduce the impact on 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”

- 16.13.9 Where sustainable development is further defined as:

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

- 16.13.10 In order to comply with responsible sourcing principles, the Contractor would refer to a relevant standard, such as BRE standard BES 6001 The Responsible Sourcing of Construction Products.

- 16.13.11 Construction would be undertaken in accordance with a detailed specification prepared in line with SHW. The Specification would define the requirements for materials used on site and would define testing and verification required to confirm acceptability for use.

16.14 Residual Effects

- 16.14.1 A slight significance of effect remains in relation to material resources and the generation and management of waste following mitigation and monitoring. This is due to the effects being largely governed by the relatively fixed volume of imported material resources required for the Scheme, and the limited scope for reuse of the relatively small proportion of waste material that the Scheme will generate.

- 16.14.2 The good practice measures outlined above do however provide a potential for reductions in the effects, whilst controlling and limiting the significance to no greater than the levels that have been assessed.

16.15 Summary

- 16.15.1 The assessment of material resources and waste arisings has been undertaken in line with DMRB IAN 153/11.
- 16.15.2 The assessment of impacts during construction and operation predicts a slight significance of effect on material resources and generation and management of waste. Procedures would be adopted by the Contractor prior to construction to control the use of materials and further reduce the impact, which shall be documented in their SWMP for the works. The Contractor's CEMP would detail measures to be implemented to manage risks associated with excavation, export and import of materials in terms of health and safety, and the environment.