M54 to M6 Link Road

TR010054

Volume 6

6.1 Environmental Statement

Chapter 10 – Material Assets and Waste

Regulation 5(2)(a)

Planning Act 2008

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

January 2020

Infrastructure Planning

Planning Act 2008

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

M54 to M6 Link Road

Development Consent Order 202[ ]

6.1 Environmental Statement

Chapter 10 Material Assets and Waste

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10.1 Introduction

10.1.1 This chapter identifies, describes and assesses the potential impacts resulting from material assets and waste associated with the construction and operation of the Scheme, following the methodology set out in the Design Manual for Roads and Bridges (DMRB) LA 110 Material Assets and Waste (Ref 10.1). This chapter summarises the regulatory and policy framework related to material assets and waste, details the methodology followed for the assessment and describes the existing environment in the area surrounding the Scheme. Following this, the design and mitigation and residual effects of the Scheme are presented.

10.1.2 For the purpose of this chapter, material assets and wastes are defined as comprising:

- the use of material assets; and
- the production and management of waste.

10.1.3 This chapter of the Environmental Statement (ES) has been prepared by competent experts with relevant and appropriate experience. The technical lead for the material assets and waste assessment has over 20 years of relevant experience and has professional qualifications as summarised in Appendix 1.1 [TR010054/APP/6.3].

10.2 Legislative and policy framework

Legislation

10.2.1 The assessment has taken account of the key legislation relevant to waste management for the Scheme, including, but not limited to:

- The Waste (England and Wales) Regulations 2011 (as amended) (Ref 10.2);
- The Environmental Permitting (England and Wales) Regulations 2016 (Ref 10.3);
- Environmental Protection Act 1990 (as amended) (Ref 10.4);
- Hazardous Waste (England and Wales) Regulations 2005 (as amended) (Ref 10.5); and
- Waste Framework Directive 2008/98/EC (Ref 10.6).

Planning policy

10.2.2 The primary basis for deciding whether or not to grant a Development Consent Order (DCO) is the National Policy Statement for National Networks (NPSNN)[1] (Ref 10.7) which sets out policies to guide how DCO applications would be decided and how the impacts of national networks infrastructure should be considered. Table 10.1 identifies the NPSNN policies relevant to the material assets and waste

[1] Although other policies can have weight as relevant and important matters in decision making. See Case for the Scheme for more information [TR010054/APP/7.2].

assessment and where in this ES chapter information is provided to address these policy requirements.

Table 10.1: NPSNN policies relevant for the materials assets and waste assessment

NPSNN para.	Requirement of the NPSNN	Location where information addresses policy requirements
5.42 and 5.43 (Waste Management)	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.	Refer to Section 10.8 'Design, mitigation and enhancement measures' Table 10.9 and 10.7. Also refer to the Outline Environmental Management Plan (OEMP) [TR010054/APP/6.11].

10.2.3 An assessment of the Schemes conformity with the relevant paragraphs and provisions for materials assets and waste in the NPSNN is presented in the NPSNN Accordance Table, Appendix A of the Case for the Scheme [TR010054/APP/7.2].

10.2.4 Other relevant policies have been considered as part of the material assets and waste assessment where these have informed the identification of receptors and resources and their sensitivity; the assessment methodology; the potential for significant environmental effects; and required mitigation. These policies include:

- National Planning Policy Framework (NPPF) (Ref 10.8): the NPPF sets out the Government's planning policies for England and how these should be applied, the document was updated in February 2019 and Chapter 17: facilitating the sustainable use of minerals, paragraph 204, is of relevance to the Scheme.
- The Waste Management Plan for England (Ref 10.9): fulfils the Waste Framework Directive (Ref 10.6) Article 28 mandatory requirements, and other required content as set out in Schedule 1 to the Waste (England and Wales) Regulations 2011 as amended.
- The National Planning Policy for Waste (2014) (Ref 10.10): The National Planning Policy for Waste (Section 8).
- 25 Year Environment Plan (2018) (Ref 10.11).
- Resources and Waste Strategy for England (2018) (Ref 10.12).
- The National and Regional Guidelines for Aggregates Provision in England 2005 to 2020 (Ref 10.13).
- The Staffordshire and Stoke-on-Trent Joint Waste Local Plan 2010-2026 (Ref 10.14) policies 1.2 and 2.1.
- The Minerals Local Plan for Staffordshire (2015-2030) (Ref 10.15): Policy 3 of the Minerals Local Plan outlines the local policy on development within a Mineral Safeguarding Area.

10.3 Assessment methodology

General approach

10.3.1 The material assets and waste assessment includes a detailed assessment of the following elements:

- Material asset use during the construction phase including site remediation, preparation and earthworks, demolition and construction (main construction material assets e.g. concrete, aggregate, asphalt and steel).
- Waste generation during the construction phase including site remediation, preparation and earthworks, demolition and construction.

10.3.2 As recorded within the Scoping Opinion, material use and waste generation is expected to be very small during the operational and maintenance phase of the Scheme (refer to Appendix 4.1 [TR010054/APP/6.3]). Thus, as confirmed in the Scoping Opinion, the consideration of effects associated with materials and waste during Scheme operation and maintenance have been scoped out of the assessment on the basis that the scale of such activities would be unlikely.

10.3.3 The key methodology document of relevance to the material assets and waste assessment is the DMRB LA 110 Material Assets and Waste (Ref 10.1).

Establishing baseline conditions

10.3.4 Detailed baseline information has been collected via a desk study of publicly available sources:

- EU Waste Framework Directive (Ref 10.6) and the Waste Management Plan for England (Ref 10.9).
- National and Regional Guidelines for Aggregates Provision in England 2005 to 2020 and are summarised in Table 10.6 (Ref 10.13).
- The Minerals Local Plan for Staffordshire (2015-2030) (Ref 10.15).
- The Environment Agency's Waste Management Information for England 2017 (published in 2018 (Ref 10.16).

Assessment of significance

10.3.5 The receptors for this assessment are:

- waste management infrastructure in West Midlands region (specifically the landfill capacity); and
- material assets used for Scheme construction.

10.3.6 Landfill capacity rather than all waste management infrastructure capacity is considered for the following reasons:

- Disposal to landfill is a permanent impact and the landfill capacity is no longer available (e.g. in most cases is irreversible).

- Impacts on other types of waste management infrastructure e.g. material recovery facilities are temporary in nature. The impacts occur over a period of months or years.
- Other types of waste management infrastructure are better placed to react to waste management market demands.

10.3.7 As part of their planning function, Waste Planning Authorities are required to ensure that sufficient land is available to accommodate facilities for the treatment of all waste arising in the area, either within the Waste Planning Authority area, or through export to suitable facilities in other areas.

10.3.8 The magnitude of waste management impacts and the significance of effects have been assessed by:

- establishing the baseline for landfill capacity in the West Midlands region;
- estimating the likely types and quantities of waste that would be generated by the Scheme; and
- comparing the likely waste arisings from the Scheme to the baseline landfill capacity and assessing the likely impact on that capacity.

10.3.9 The magnitude of material asset impacts and the significance of effects have been assessed by:

- estimating the likely types and quantities of the main construction materials that would be required by the Scheme;
- estimating the likely proportion of construction and demolition waste that would be recovered;
- estimating the proportion of secondary or recycled aggregate that would be used for construction of the Scheme; and
- comparing the likely recovery rate and proportion of recycled and secondary aggregate to the relevant national targets.

10.3.10 The criteria used for assessing the magnitudes of impacts and their significance are shown in Table 10.2 below.

Table 10.2: Magnitude of impacts and effects significance criteria

Magnitude of impact	Effect significance	Material assets	Waste
Neutral	Not Significant	Project achieves >99% overall material recovery / recycling (by weight) of non-hazardous Construction Demolition Waste (CDW) to substitute use of primary materials; and Aggregates required to be imported to site comprise >99% re-used / recycled content.	No reduction or alteration in the capacity of waste infrastructure at a regional scale.

Magnitude of impact	Effect significance	Material assets	Waste
Slight	Not Significant	Project achieves 70-99% overall material recovery / recycling (by weight) of non-hazardous CDW 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.	≤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	Significant	Project achieves less than 70% overall material recovery / recycling (by weight) of non-hazardous CDW 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.	>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	Significant	Project achieves <70% overall material recovery / recycling (by weight) of non-hazardous CDW 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.	>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	Significant	Not applicable	>1% reduction or alteration in national capacity of waste infrastructure, as a result of accommodating waste from a project; or Project would require new (permanent) waste infrastructure to be constructed to accommodate waste.

Scoping response

10.3.11 The proposed scope of the material assets and waste assessment was detailed in the Environmental Impact Assessment (EIA) Scoping Report (Ref 10.17) submitted to the Inspectorate on 11 January 2019. An overview of the Inspectorate's scoping opinion in relation to material assets and waste is presented in Table 10.3. Where

the assessment has been undertaken in accordance with the scoping opinion point, a response and the relevant ES section is provided; where an alternative approach has been agreed with the relevant stakeholders, an explanation is provided.

Table 10.3: Scoping opinion and response

Scoping Opinion	Where addressed in the ES
The Inspectorate	
Given that significant operational effects with regards to materials and waste generation are unlikely, and that the effect of any resurfacing activity is to be addressed as part of the GHG (greenhouse gas) assessment, the Inspectorate is satisfied that this matter is unlikely to result in significant effects and can be scoped out of the assessment.	Noted. Refer to paragraph 10.3.2.
The Applicant should consider the relevant National Policy Statement (NPS) requirements (paragraph 5.182) which states: Where a proposed development has an impact on a Mineral Safeguarding Area (MSA), the Secretary of State should ensure that the Applicant has put forward appropriate mitigation measures to safeguard mineral resources. Staffordshire County Council have requested the Applicant to assess the impact of the Proposed Development on potential operations on the Hilton Main site, as well as its impact on land adjoining the mineral site and within the MSA. In light of this, the Inspectorate does not agree that this matter can be scoped out at this stage, and requests that further assessment is undertaken within the ES, where significant effects could occur.	Refer to Appendix 10.1 Minerals Safeguarding Report [TR010054/APP/6.3].
The Construction Environmental Management Plan (CEMP) and Site Waste Management Plan (SWMP) should set out how material will be reused or recycled if applicable. The Applicant's attention is drawn to the response from the Environment Agency in Appendix 2 which provides further advice on this matter. The Applicant should provide draft copies of these documents appended to the ES and/or demonstrate how they are intended to be secured through the DCO.	Refer to paragraphs 10.8.4 - 10.8.9 and the OEMP [TR010054/APP/6.11].
The ES should explain how the CEMP will address handling, treatment and management of contaminated materials (on and offsite) during the construction of the Proposed Development. The assessment should explain how unexpected finds will be addressed.	Refer to the OEMP [TR010054/APP/6.11] and Chapter 9: Geology and Soils, Section 9.8 'Design, mitigation and enhancement'
To ensure that baseline information contained within the ES is up to date, the Applicant should check with the relevant consultation bodies that no new sites have been designated or areas of contaminated land identified.	Consultation with the Environment Agency and Staffordshire County Council did not identify any additional designated areas or areas of contaminated land. Refer to Chapter 9: Geology and Soils, Section 9.3 'Assessment methodology'.

Scoping Opinion	Where addressed in the ES
Environment Agency	
We would welcome opportunity to comment on the CEMP. Thought should be given to both reuse of material under CL:AIRE protocol and also to suitably Permitted recycling facilities in the area. Duty of Care should be checked including carriers certificates for any waste carriers, and waste transfer notes for movements of waste material.	Refer Section 10.8 'Design, mitigation and enhancement measures' paragraphs 10.8.4 - 10.8.9.
Any waste produced as part of this development must be dealt with in accordance with the current Environmental Permitting (England & Wales) Regulations 2010 (2010 Regulations). Where possible, the production of waste from the development should be minimised and options for the reuse or recycling of any waste produced should be utilised before considering off site recovery or disposal at a suitably Permitted facility. Should it be necessary to import suitable waste material to the site for use in the construction of the development (i.e. for the construction of hard-standing areas, access tracks etc.), then an Exemption under Schedule 3 of the 2010 Regulations will be required. Exemptions must be registered with the Environment Agency prior to bringing waste on site. Please note that any deposit of waste in or on land for its recovery or disposal, will require a Permit under the 2010 Regulations.	Refer Section 10.8 'Design, mitigation and enhancement measures' paragraphs 10.8.4 - 10.8.9.
All of the above waste matters should be brought together in a Waste Management Plan.	Refer to Section 10.8 'Design, mitigation and enhancement measures', paragraph 10.8.5.
Staffordshire County Council	
[…] the impact of the Scheme on potential operations on the Hilton Main site should be assessed as well as its impact on land adjoining the mineral site and within the MSA. In this matter, the applicant should consider the requirements of the relevant NPS (paragraph 5.182) which states: Where a proposed development has an impact on a Mineral Safeguarding Area (MSA), the Secretary of State should ensure that the applicant has put forward appropriate mitigation measures to safeguard mineral resources. Furthermore, the assessment should consider the requirements of Policy 3 of the Minerals Local Plan for Staffordshire (2015 – 2030) which relates to safeguarding minerals of local and national importance and important infrastructure. Proposals to assess the impact of material use (including primary aggregates and alternative sources of aggregate) and waste arisings during construction are welcomed. With regard to material (mineral) use, an assessment should be undertaken on the impact on existing provision from quarries and whether provision of construction aggregates can be achieved with material extracted from within the area of the Scheme. Similarly, regarding the disposal of construction / excavation wastes, an assessment should include whether there are opportunities to use such wastes within the Scheme for the purposes of landscaping if not suitable for engineering uses. These assessments should consider the cumulative	Refer to Appendix 10.1 Minerals Safeguarding Report [TR010054/APP/6.3]. The estimated waste capacity and materials availability data used in the assessment are generated by the relevant authorities based on future regional demand projections, including consideration for other significant projects within the West Midlands. Therefore, cumulative assessment of mineral use/ waste management has not been considered further.

Scoping Opinion	Where addressed in the ES
impacts of mineral use/ waste management of other significant projects in the area i.e. the West Midlands Interchange project and HS2.	
Public Health England	
The EIA should demonstrate compliance with the waste hierarchy (e.g. with respect to reuse, recycling or recovery and disposal). For wastes arising from the installation the EIA should consider: • the implications and wider environmental and public health impacts of different waste disposal options • disposal route(s) and transport method(s) and how potential impacts on public health will be mitigated.	Refer to Section 10.8 'Design, mitigation and enhancement measures' Refer to Section 10.4 'Assessment assumptions and limitations' paragraph 10.4.2 This assessment does not consider the environmental impacts associated with the extraction of raw materials and the manufacture of products, nor the impact at waste management facilities. It is assumed that any such issues would have been subject to the applicable environmental assessment/ permitting and planning approval for the relevant facilities. The assessment of likely significant effects associated with the transport of waste is assessed in Chapter 5: Air Quality and Chapter 11: Noise and vibration.

Consultation

10.3.12 The Preliminary Environmental Information (PEI) Report for this Scheme (Ref 10.18) was published in May 2019 as part of the statutory consultation. The PEI Report presented the environmental information collected, together with the preliminary findings of the assessment of likely significant environmental effects of the Scheme at the time. Comments received during public consultation and the associated responses, are detailed within the Consultation Report [TR010054/APP/5.1]. No specific material assets and waste consultation has been undertaken for this Scheme.

10.4 Assessment assumptions and limitations

10.4.1 Information on the current permitted regional landfill capacity is provided in Table 10.4 and Table 10.5. There is no available information on any potential changes to this permitted capacity prior to construction of the Scheme.

10.4.2 This assessment does not consider the environmental impacts associated with the extraction of raw materials and the manufacture of products, nor the impact at waste management facilities. It is assumed that any such issues would have been subject to the applicable environmental assessment/ permitting and planning approval for the relevant facilities.

10.5 Study area

10.5.1 The study area for waste generation is defined by the Scheme boundary, within which waste would be generated. The study area is deemed to include the footprint of the Scheme, together with any temporary land requirements during the construction phase. This may include temporary offices, compounds and storage areas.

10.5.2 The study area for waste management comprises the wider region within which waste management infrastructure, specifically landfill capacity is located i.e. the West Midlands region (the shire counties of Staffordshire, Warwickshire, Worcestershire, the unitary counties of Herefordshire, Shropshire, the metropolitan boroughs of Birmingham, Coventry, Dudley, Sandwell, Solihull, Walsall, Wolverhampton, the city of Stoke-on Trent and the borough of Telford and Wrekin).

10.5.3 The study area for the use of material assets in the construction of the Scheme and for consideration of the sterilisation of mineral safeguard sites and/or peat resources is defined by the Scheme boundary.

10.5.4 The study area for alternative materials (secondary and recycled aggregates) is the West Midlands region and England.

10.6 Baseline conditions

Waste

10.6.1 Baseline information consists of the current landfill capacity in the waste disposal authority (Staffordshire), and in the wider West Midlands region as defined in paragraph 10.5.2.

10.6.2 Detailed information has been collected from sources including data on landfill capacity published by the Environment Agency.

10.6.3 The Environment Agency's Waste Management Information for England 2017 (Ref 10.16) includes the following information about remaining landfill capacity in Staffordshire, and in the wider West Midlands region in 2018.

Table 10.4: Staffordshire landfill capacity 2018

Landfill Type	Capacity (000 m^3)
Hazardous Merchant	252
Hazardous Restricted	-
Non Hazardous with SNRHW* cell	2,453
Non Hazardous	8,033
Non Hazardous Restricted	-
Inert	4,605
Total	15,343

Table 10.5: West Midlands landfill capacity 2018

Landfill Type	Capacity (000 m^3)
Hazardous Merchant	252
Hazardous Restricted	535
Non Hazardous with SNRHW* cell	9,627
Non Hazardous	32,324
Non Hazardous Restricted	-
Inert	12,435
Total	55,172

*SNRHW = selected non-reactive hazardous waste

Materials Resources

10.6.4 The baseline target for recovery of construction and demolition waste is 70% by weight, as set out in the EU Waste Framework Directive (Ref 10.6) and the Waste Plan for England (Ref 10.9). Uncontaminated excavated soil and stones (European Waste Code 17 05 04) are specifically excluded from this target.

10.6.5 The baseline targets for alternative aggregates (which comprise both secondary aggregates, which are by-products from industrial and mining operations, and recycled aggregates, which are produced from construction waste) are set out in the National and Regional Guidelines for Aggregates Provision in England 2005 to 2020 and are summarised in Table 10.6 (Ref 10.13). The relevant target for the Scheme is the 27% guideline set for the West Midlands region.

Table 10.6: National and regional guidelines for aggregates provision

Region	Total aggregate provision (million tonnes)	Alternative materials targets (secondary and recycled aggregates)
South East	502	26%
London	197	48%
East	382	31%
East Midlands	784	14%
West Midlands	370	27%
South West	656	22%
North West	392	30%
Yorkshire & the Humber	431	31%
North East	193	26%
England (total)	3,908	25%

10.6.6 The Minerals Local Plan for Staffordshire (2015-2030) (Ref 10.15) was adopted by Staffordshire County Council on the 16 February 2017. The Scheme is located within a Mineral Safeguarding Area as illustrated in the Policies and Proposals Map included in the Minerals Local Plan. There are no active mineral site allocations within the boundary of the Scheme, however a mineral site with permitted reserves is located at Hilton Park which is surrounded by a 250 m consultation zone. The Scheme is within this consultation zone.

Future baseline

10.6.7 As detailed in Chapter 4: Environmental Assessment Methodology, in order to identify the effects of the Scheme on environmental features, it is important to understand the baseline at the year of construction commencement and at the year the Scheme becomes operational. The baseline conditions for these years may be different to the current conditions and such changes could alter the sensitivity of existing environmental receptors, as well as introduce new sensitive receptors.

10.6.8 There is no available information on any potential changes to landfill capacity by the time of construction of the Scheme. As outlined in the Local Waste Plan (Ref 10.14), paragraph 3.33) "*in relation to landfill and void capacity, there are 21 permitted landfill sites, 10 of which are currently operational and evidence suggests that currently, based on forecasts for waste produced in Staffordshire and Stoke-on-Trent, there is sufficient void capacity over the next 15 years to accommodate the 'secondary' landfill of MSW [municipal solid waste] and C&I [commercial and industrial] waste, and the disposal of CD&E waste to restore mineral sites. Evidence also indicates that due to the many mineral extraction sites, Staffordshire has been providing landfill capacity to neighbouring authorities for many years, and concludes that for non hazardous waste there is likely to be capacity to receive 'imports' because of the capacity available at planning obligated sites i.e. mineral sites with planning permission that permits restoration by landfill*". However this information is insufficient to set a construction year or opening year baseline since it is not possible to accurately estimate the extent of any additional permitted waste management capacity that may be developed by 2021 or 2024.

10.7 Potential impacts

10.7.1 Mitigation measures are being incorporated in the design and construction of the Scheme; these are set out in Section 10.8. Prior to implementation of mitigation a summary of the potential impacts associated with the construction and operation of the Scheme is outlined below.

Construction

10.7.2 There is potential for the following impacts relating to material resources and waste arising to occur during construction of the Scheme:

- impacts on-site generated materials (e.g. soils) and waste arisings have on the existing capacity of landfill; and
- impacts on the use of primary (i.e. non-recycled) material resources used for construction.

10.7.3 Table 10.7 summarises the types of materials used and wastes that may potentially be generated during construction.

Table 10.7: Potential material use and waste arisings – construction

Project activity	Material use	Potential waste arisings
Site remediation/ preparation/ earthworks	Fill material for construction purposes Primary aggregates for ground stabilisation	Surplus excavated materials. Stripping of topsoil and subsoil. Potential to encounter contaminated soils.
Demolition	Materials are not required for demolition works	Waste arisings from the demolition of any existing buildings or structures.
Site construction	Construction materials including: concrete; asphalt and bituminous material; cement bound granular material; well graded granular material; precast concrete kerb; timber; plywood; cementitious grout; reinforcing steel; reinforcing fabric; geotextile; geo-composite drainage system; pipe bedding aggregate; and filter drain material.	Packaging material. Excess construction materials and broken/ damaged construction materials. Existing highway infrastructure and technology as removed by excavation works. Waste oils from construction vehicles. Construction worker generated wastes.

10.7.4 The estimated main types and quantities of materials anticipated to be used during construction are shown in Table 10.8.

Table 10.8: Estimated main types and quantities of materials used during Scheme construction

Material category	Material subcategory	Material density (1) (tonnes/m^3)	Quantity required to be imported to site		Recycled content (% by weight) (2)
			m^3	tonnes	
Asphalt	Surface, binder and base course	2.3	38,576	88,726	25
Unbound aggregates	Type 1 subbase	1.85	74,594	137,999	50
Concrete	Insitu and precast products	2.4	65,744	157,785	16
Total			**178,914**	**384,510**	**30% (116,427 tonnes)**

(1) Data on the bulk density of materials has been used to convert quantities between volume (m^3) and weight (tonnes). Information on the typical bulk density of materials was sourced from Embodied Carbon: The Inventory of Carbon and Energy (ICE) (Ref 10.19).

(2) The estimated recycled content for each material is based on the “good practice” recycled content rates from WRAP’s Designing Out Waste Tool for Civil Engineering (Ref 10.20). The total recycled content is calculated as a percentage by weight. The actual recycled content achieved during construction will depend on the availability of material containing recycled content and technical suitability.

10.7.5 The estimated main types and quantities of waste generated during construction and the potential recovery rates are shown in Table 10.9. A 5% wastage rate has been applied to the main construction materials.

Table 10.9: Estimated main types and quantities of waste generated during Scheme construction

Activity	Waste type	Waste classification	Waste density (1) (tonnes/m³)	Quantity		Potential management route(s)	Potential recovery rate (% by weight)2)
				tonnes	m³		
Site remediation/ preparation/ earthworks	Vegetation and wood from site clearance	Non-hazardous	1.25	10,160	12,700	Off site composting or recovery	90%
	Asphalt	Non-hazardous	2.4	6,446	2,686	Off site recycling	95%
	Concrete	Non-hazardous	2.4	3,416	1,423	Off site recycling	95%
	Steel (general)	Non-hazardous	2	2,573	1,286	Off site recycling	100%
	Plastic	Non-hazardous	1.4	32	23	Off site recycling or recovery	80%
	Copper	Non-hazardous	2	1	0.3	Off site recycling	100%
	Aluminium	Non-hazardous	2	263	131	Off site recycling	100%
Site construction	Asphalt	Non-hazardous	2.4	3,680	1,533	Off site recycling	95%
	Unbound aggregates	Non-hazardous	1.9	6,900	3,632	Off site recycling	95%
	Concrete	Non-hazardous	2.4	7,889	3,287	Off site recycling	95%
	Steel (general)	Non-hazardous	2	238	119	Off site recycling	100%
	Steel (rebar)	Non-hazardous	2	183	91	Off site recycling	100%
	Plastic	Non-hazardous	1.4	48	35	Off site recycling or recovery	80%
	Copper	Non-hazardous	2	0.32	0.16	Off site recycling	100%
	Timber	Non-hazardous	1.25	17	14	Off site recycling or recovery	90%
	Aluminium	Non-hazardous	2	9	4	Off site recycling	100%
	Iron	Non-hazardous	2	2	1	Off site recycling	100%

Activity	Waste type	Waste classification	Waste density (1) (tonnes/m³)	Quantity		Potential management route(s)	Potential recovery rate (% by weight)2)
				tonnes	m³		
Total		Non-hazardous		41,855	26,966	Total non-hazardous recovery rate	94%

(1) Data on the bulk density of materials has been used to convert quantities between volume (m³) and weight (tonnes). Information on the typical bulk density of materials was sourced from WRAP's Designing Out Waste Tool for Civil Engineering (Ref 10.20) and Embodied Carbon: ICE (Ref 10.19). Where data was not available, professional judgement was used.

(2) The estimated recovery rates are based on the "good practice quick win" recovery rates set out in the "Achieving good practice Waste Minimisation and Management" report published by WRAP (Ref 10.21). The overall recovery rate is calculated by tonnage.

10.7.6 Excavated material is not included in Table 10.9 or when calculating the overall waste recovery rate, since where possible the material would be reused on site and hence not be categorised as a waste and the government's recovery target does not include excavated material (uncontaminated excavated soil and stones (EWC 17 05 04).This approach is consistent with the waste hierarchy and the objectives of minimising waste generation and reusing materials.

10.7.7 For the majority of highways schemes, the largest quantities of materials and waste are generally those associated with earthworks, especially in those cases where a balance between excavation ("cut") and material placement ("fill") cannot be achieved.

10.7.8 The Scheme design is currently being progressed to optimise the requirements for cut and fill and where possible this will be minimised to reduce the import and export of materials and waste. The project design team aim is to achieve a cut-fill balance, however predicted cut and fill for the Scheme is likely to be imbalanced and disposal of material will be required.

10.7.9 As outlined in the Minerals Local Plan (Ref 10.15) there are significant mineral sources within Staffordshire, such that materials required for the Scheme could be sourced locally in order to minimise travel distances.

10.7.10 As outlined in the baseline section the Scheme is located within a Mineral Safeguarding Area. There are no active mineral site allocations (mineral safeguarding within the boundary of the Scheme, however a mineral site with permitted reserves is located at Hilton Park which is surrounded by a 250 m consultation zone. The Scheme is within this consultation zone (refer to Appendix 10.1 Minerals Safeguarding Report [TR010054/APP/6.3]).

Operation

10.7.11 Material use and waste generation is expected to be very small during operation of the Scheme. Routine maintenance would include gully emptying and litter collection. Periodically, maintenance activities such as resurfacing would be required. Waste arising from these maintenance activities is expected to be generally the same (in both type and quantity) to that generated by the existing strategic highways network; and the wastes would be managed using the established procedures and facilities that are used across the strategic highways network.

10.7.12 For these reasons, materials and waste during the operational phase have been scoped out of the assessment as referenced in paragraph 10.3.2.

10.8 Design, mitigation and enhancement measures

Embedded mitigation

10.8.1 The Scheme has been designed, as far as possible, to avoid and minimise impacts and effects on the Material Assets and Waste through the process of design-development (refer to Chapter 3: Assessment of Alternatives) considering good design principles. Embedded mitigation defined within the DMRB LA 104

(Ref 10.22) as 'Design measures which are integrated into a project for the purpose of minimising environmental effects' is reported as part of the scheme description in Chapter 2: The Scheme. The following section reports the essential mitigation required in addition to embedded mitigation to reduce and offset likely significant adverse environmental effects. Essential mitigation is defined as 'Mitigation critical for the delivery of a project which can be acquired through statutory powers' (Ref 10.22).

Essential mitigation

10.8.2 The Scheme aims to prioritise waste prevention, followed by preparing for re-use, recycling and recovery and lastly disposal to landfill as per the internationally recognised waste hierarchy (see Plate 10.1).

10.8.3 The following mitigation measures have been considered to date and will be further considered and implemented where applicable during the detailed design phase and subsequent construction work:

- design for reuse and recovery: identifying, securing and using materials that already exist on site, or can be sourced from other projects;
- design for materials optimisation: simplifying layout and form to minimise material use, using standard design parameters, balancing cut and fill, maximising the use of renewable materials and materials with recycled content;
- design for off-site construction: maximising the use of pre-fabricated structure and components, encouraging a process of assembly rather than construction;
- design for the future (deconstruction and flexibility): identify how materials can be designed to be more easily adapted over an asset lifetime and how deconstructability and demountability of elements can be maximised at end of first life;
- design for waste efficient procurement: identify and specify materials that can be acquired responsibly, in accordance with a recognised industry standard; and
- engineering plan configurations and layouts that show how the most effective use of materials and arisings can be achieved.

Plate 10.1: Waste hierarchy

Construction

10.8.4 An OEMP [TR010054/APP/6.11] has been prepared as an iterative process in parallel with the development of the Scheme design and construction methodology. Measures within it include design, construction and operational mitigation, which have been defined in part by the requirements which arise from the technical assessments presented in this ES.

10.8.5 The construction of the Scheme would be subject to measures and procedures defined within a CEMP. The CEMP would be based on the OEMP and would include the implementation of industry standard practice and control measures for environmental impacts arising during construction, such as the control of dust and the approach to waste management on site. The CEMP would be produced by the construction contractor prior to works commencing in accordance with DMRB LA 120 (Ref 10.23) and would include a SWMP.

10.8.6 The SWMP would set out a recording process for the management of waste, including the storage and transport of waste on-site and a recording mechanism for required waste documentation such as Waste Transfer or Consignment Notes (dependent on the waste stream) in order to confirm the assessment of the waste impact and to implement the embedded mitigation measures. The SWMP would include procedures for monitoring the overall construction waste recovery rate and the proportion of secondary and recycled aggregate used in the Scheme, in order to confirm the assessment of materials impacts.

10.8.7 The CEMP would require contractors to adopt good practice in construction waste management which would reduce the quantity of waste generated. The following approaches would be implemented, where practicable, in order to minimise the quantities of waste requiring disposal:

- Agreements with material suppliers to reduce the amount of packaging or to participate in a packaging take-back scheme.
- Implementation of a ‘just-in-time’ material delivery system to avoid materials being stockpiled, which increases the risk of their damage and disposal as waste.
- Attention to material quantity requirements to avoid over-ordering and generation of waste materials.
- Re-use of materials wherever feasible e.g. re-use of excavated soil for landscaping. Concrete would be taken off-site for crushing and re-use.
- Segregation of waste at source where practical.
- Re-use materials within the construction by carrying out remediation or soil improvement, where feasible, in order to mitigate any contamination or geotechnical risks.
- Re-use and recycling of materials off-site where re-use on-site is not practical (e.g. through use of an off-site waste segregation facility and re-sale for direct re-use or re-processing).

- The re-use of excavated soils during Scheme construction would be governed by a Materials Management Plan (MMP) (included within the CEMP) which would be developed in accordance with CL:AIRE Code of Practice which is a voluntary framework for excavated materials management and re-use. Following this framework would result in a level of information being generated sufficient to demonstrate that excavated material has been re-used appropriately and is suitable for its intended use. It would demonstrate that unsuitable material or waste had not been used in the development. The MMP would detail the procedures and measures that would be taken to classify, track, store, re-use and dispose of all excavated materials that would be encountered during the Scheme construction phase.

10.8.8 The CEMP would require that the following waste management measures are implemented in order to minimise the likelihood of any localised impacts of waste on the surrounding environment:

- Damping down of surfaces during spells of dry weather and brushing or water spraying of heavily used hard surfaces and access points across the site as required.
- Off-site prefabrication, where practical, including the use of prefabricated structural elements, cladding units, toilets, mechanical and electrical risers and packaged plant rooms.
- Burning of waste or unwanted materials would not be permitted on-site.
- All hazardous materials including fuels, chemicals, cleaning agents, solvents and solvent containing products to be kept in sealed containers at the end of each day prior to storage in appropriately protected and bunded storage areas.
- All demolition and construction workers would be required to use appropriate Personal Protective Equipment whilst performing activities on-site.
- Any waste effluent would be tested and where necessary, disposed of at an appropriately licensed facility by a licensed specialist contractor(s).
- Where there is a requirement to dispose of surplus or unsuitable soils off-site as waste, the material would be characterised to determine firstly whether it is hazardous or non-hazardous waste in accordance with the Environment Agency's Technical Guidance WM3 (Ref 10.24). Once this is established, the appropriate disposal facility would be determined through Waste Acceptance Criteria analysis as required.
- Materials requiring removal from the site would be transported using licensed carriers and records would be kept detailing the types and quantities of waste moved, and the destinations of this waste, in accordance with relevant regulations.

10.8.9 The OEMP [TR010054/APP/6.11] sets a target that 27% of aggregates should be secondary and recycled aggregates, for those applications where it is technically and economically feasible to substitute these alternative materials for primary aggregates. This is in line with the West Midlands regional target for the use of alternative aggregates.

10.8.10 The OEMP sets a target of 70% for recovery of waste. This is in line with the government target as outlined in paragraph 10.6.4.

Enhancement measures

10.8.11 No enhancement measures related to material assets and waste have been identified to date. Opportunities will be further considered and implemented where applicable during the detailed design phase and subsequent construction work. Example enhancement opportunities for material assets and waste include:

- Use of surplus recycled or recovered materials in community projects e.g. utilising recycled mulch from tree felling on adjacent community facilities.
- Reusing suitable material for construction of noise and landscape bunding outside of the highways boundary where need has been previously identified (where land availability allows) to improve environmental outcomes for a wide range of receptors.

10.9 Assessment of likely significant effects

Material assets

10.9.1 The Scheme would set a target of 27% use of secondary and recycled aggregates, for those applications where it is technically and economically feasible to substitute these alternative materials for primary aggregates. This target is in accordance with the regional guidelines for the West Midlands, given the location of the Scheme (relatively close to large sources of secondary and recycled aggregate) it is possible to achieve this target in practice. The effects are assessed as being slight and not significant.

10.9.2 Applying good industry practice to management of the waste materials generated by the Scheme, it is anticipated that an overall recovery rate of 94% can be achieved. This exceeds the Government's 70% target for recovery of construction waste and the effects are therefore assessed as being slight adverse and not significant.

10.9.3 As stated in Appendix 10.1 Minerals Safeguarding Report [TR010054/APP/6.3] it is not anticipated that any mineral safeguarding sites will be sterilised, the effects are therefore assessed as not significant.

Waste

10.9.4 Construction of the Scheme is expected to generate approximately 41,855 tonnes of waste (approximately 26,966 m^3), excluding earthworks material (Table 10.9).

10.9.5 An excess of approximately 140,339 m^3 of excavated material is anticipated, this includes unacceptable material and wastage from construction.

10.9.6 The existing landfill capacity in the West Midlands (of all types) has been determined, from Environment Agency data (Ref 10.16), as being approximately 55.2 million m^3.

10.9.7 Based on a worst-case assumption that all waste generated from the Scheme would be disposed of to landfill, this would utilise approximately 0.3% of the regional landfill capacity. In practice a large proportion of waste from the Scheme is likely to be recovered rather than disposed of to landfill, further reducing the overall quantities of waste for disposal.

10.9.8 The Scheme would result in less than 1% reduction or alteration in the regional capacity of waste infrastructure (specifically landfill), and there is adequate disposal capacity within the region to accommodate all the waste from the Scheme (although in practice a high proportion of waste would be recovered rather than requiring disposal). The effects are therefore assessed as being slight adverse and not significant.

10.10 Monitoring

Construction

10.10.1 No significant material asset and waste effects are expected during construction, therefore no monitoring is proposed.

10.10.2 The OEMP [TR010054/APP/6.11] sets out monitoring to be undertaken during the construction stage to ensure that the mitigation measures embedded in the Scheme design are appropriately implemented.

10.11 References

Ref 10.1 Highways England (2019) Design Manual for Roads and Bridges LA 110 Material Assets and Waste. Available online at: http://www.standardsforhighways.co.uk/ha/standards/dmrb/vol11/section3/LA%20110%20Material%20assets%20and%20waste-web.pdf

Ref 10.2 The Waste (England and Wales) Regulations 2011 (as amended)

Ref 10.3 The Environmental Permitting (England and Wales) Regulations 2016

Ref 10.4 Environmental Protection Act 1990 (as amended)

Ref 10.5 Hazardous Waste (England and Wales) Regulations 2005 (as amended)

Ref 10.6 European Commission (2008) Waste Framework Directive (2008/98/EC)

Ref 10.7 Department for Transport (2014) National Policy Statement for National Networks (NPSNN)

Ref 10.8 Ministry of Housing, Communities and Local Government (2019) National Planning Policy Framework (NPPF)

Ref 10.9 Department for Environment, Food and Rural Affairs (2013) Waste Management Plan for England

Ref 10.10 Ministry of Housing, Communities and Local Government (2014) The National Planning Policy for Waste

Ref 10.11 Department for Environment Food and Rural Affairs (2018) 25 Year Environment Plan

Ref 10.12 Department for Environment Food and Rural Affairs (2018) Resources and Waste Strategy for England

Ref 10.13 Ministry of Housing, Communities and Local Government (2009) The National and Regional Guidelines for Aggregates Provision in England 2005 to 2020

Ref 10.14 Staffordshire County Council and City of Stoke on Trent (2013) The Staffordshire and Stoke-on-Trent Joint Waste Local Plan 2010-2026

Ref 10.15 Staffordshire County Council (2017) The new Minerals Local Plan for Staffordshire (2015-2030)

Ref 10.16 Environment Agency (2019) The Environment Agency's Waste Management Information for England 2017 Available online at: https://www.gov.uk/government/publications/waste-management-data-for-england

Ref 10.17 Highways England (2019) M54-M6/ M6 Toll Link Road: PCF Stage 3 EIA Scoping Report. Available online at: https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR010054/TR010054-000025-54M6-Scoping%20Report.pdf

Ref 10.18 Highways England (2019) M54 to M6 Link Road Preliminary Environmental Information Report. Available online at: https://highwaysengland.co.uk/projects/m54-to-m6m6-toll-link-road/

Ref 10.19 Prof. Geoffrey Hammond and Craig Jones, Ed. Fiona Lowrie and Peter Tse (2011) Embodied Carbon: The Inventory of Carbon and Energy (ICE)

Ref 10.20 WRAP's Designing Out Waste Tool for Civil Engineering. Available online at: http://dowtce.wrap.org.uk/

Ref 10.21 WRAP (undated) Achieving good practice Waste Minimisation and Management, Guidance for construction clients, design teams and contractors. Available online at: http://www.wrap.org.uk/sites/files/wrap/WMM%20guide%20Mid%20level.pdf

Ref 12.22 Highways England (2019) Design Manual for Roads and Bridges LA 104 Environmental Ass4essment and Monitoring. Available online at: http://www.standardsforhighways.co.uk/ha/standards/dmrb/vol11/section2/la104.pdf

Ref 10.23 Highways England (2019) Design Manual for Roads and Bridges LA 120 Environmental Management Plan. Available online at: http://www.standardsforhighways.co.uk/ha/standards/dmrb/vol11/section2/LA%20120%20Environmental%20management%20plans-web.pdf

Ref 10.24 Environment Agency (2018) Technical Guidance WM3: Waste Classification – Guidance on the classification and assessment of waste