



MAMHILAD

ENVIRONMENTAL STATEMENT

CHAPTER 13

WASTE MANAGEMENT



Consultation Draft

Chapter 13 Contents

13	Waste Management	1
13.1	Introduction	1
13.2	Assessment Methodology	3
13.3	Legislative and Policy Context	9
13.4	Baseline Conditions	12
13.5	Assessment of Effects, Mitigation and Residual Effects	13
13.6	Assessment of Cumulative Effects.....	21
	References	24

Chapter 13 Figures

Figure 13.1 The Waste Hierarchy (within Chapter)

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13 Waste Management

13.1 Introduction

13.1.1 This chapter assesses the likely effects in terms of waste management associated with the proposed development. The likely impacts associated with the management of waste generated during the construction and operational phases are assessed for the purpose of encouraging sustainable waste management and constructional methods that demonstrate good practice and achieve legislative compliance.

13.1.2 For the purpose of this assessment, "waste" is defined as "any substance or object which the owner discards, intends to discard or is required to discard", as specified in Section 75 (2) of the Environmental Protection Act 1990 (Ref 13.1).

13.1.3 This chapter considers the solid waste materials likely to be generated as a result of the proposed development and the strategies for managing them. The anticipated waste materials can be split into two distinct phases:

- Site clearance, demolition, excavation during construction of the project: and
- Wastes generated during the operational phase including maintenance and public wastes.

13.1.4 The main types of waste considered as part of this assessment are described in Table 13.1 below.

Table 13.1: Definition of Waste Categories

Types of Waste	Definition
Hazardous	Solid wastes that are toxic, ignitable, reactive or corrosive. Also waste that may be harmful to human health or the environment
Non Hazardous	Waste that is not classified as hazardous, e.g. commercial, domestic, industrial waste
Inert	Non-hazardous waste that does not undergo any significant physical, chemical or biological transformation. Also does not dissolve, burn or otherwise physically or chemically react, biodegrade or adversely affect other matter with which it comes into contact in a way likely to give rise to environmental pollution or harm to human health

13.1.5 Particular attention will be paid to the hierarchical waste management strategy outlined in the Waste Strategy 2007 (Ref 13.2). The strategy prioritises the options for waste management starting with the most sustainable option (reduction) and ending with the least sustainable option (disposal).

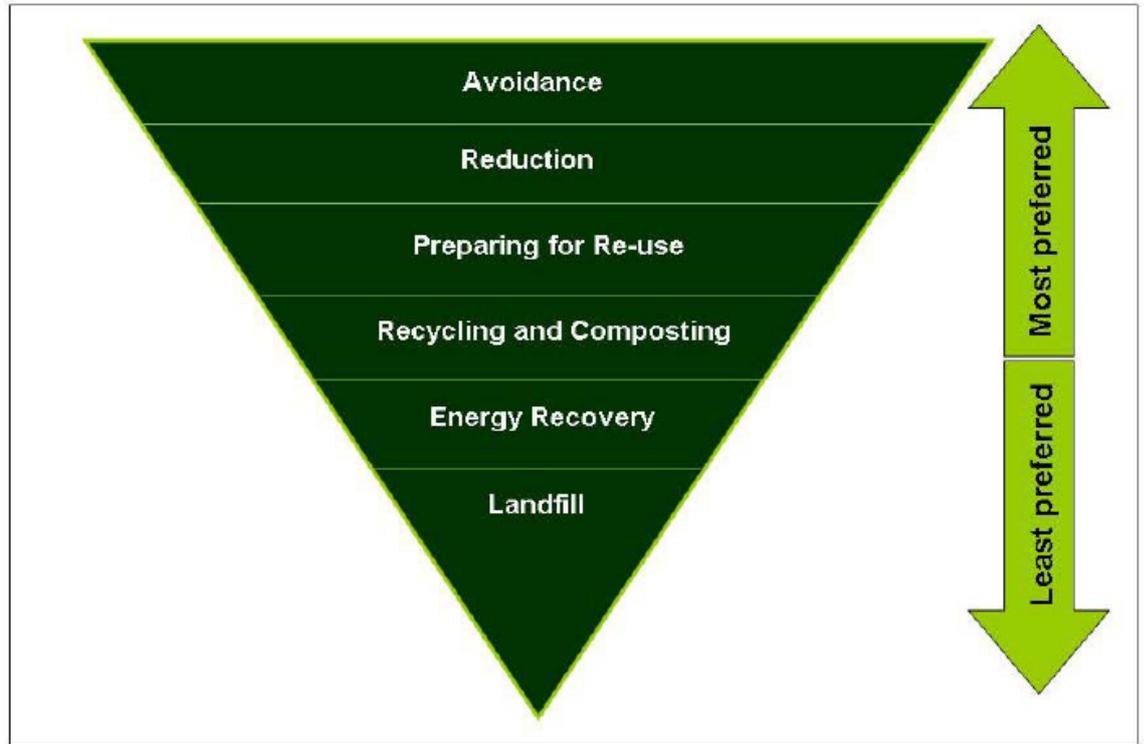
13.1.6 In addition, Paragraph 1 of Article 4 of the revised Waste Framework Directive (WFD) 2008/98/EC (Ref 13.3) states that the following waste hierarchy shall apply as a priority order in waste prevention and management legislation and policy:

- a) prevention;
- b) preparing for re-use;
- c) recycling;
- d) other recovery, e.g. energy recovery; and
- e) disposal.

13.1.7 The waste hierarchy has been transposed into UK law through the Waste (England and Wales) Regulations 2011 (ref 13.4).

13.1.8 Therefore, waste arisings from the proposed development should, where possible, be dealt with nearer the top end of the hierarchy as shown in the diagram below:

Figure 13.1 The Waste Hierarchy Diagram



13.1.9 Table 13.2 below lists the waste objectives which will be considered for the proposed development. These are based on the policy framework, best practice and experience from previous projects.

Table 13.2 Waste Objectives

Objective		Basis
1	Health and safety	Where necessary, H&S must be the overriding decision making factor in accordance with the relevant H&S legislation, including the Construction (Design and Management) Regulations 2015 (Ref 13.5).
2	Sustainability	Waste management options appraisal should take into account the balance of economic, social and environmental advantages and disadvantages, having regard to the relevant Council sustainability policy.
3	Where practicable waste will be managed in accordance with the Waste Hierarchy	This is central to the National Waste Strategy. Towards Zero Waste (TZW) (2010) (Ref 13.18) and is a legal requirement under the Site Waste Management Plans (England) Regulations 2008 (SWMP) and the Waste (England and Wales) Regulations 2011. Priority should be given to waste minimisation, followed by direct reuse, efficient recycling, recovery and disposal as a last resort.
4	Best practice approach	The Site Waste Management Plan (SWMP) Regulations brings the SWMP approach into standard practice. To achieve best practice the project should look towards an enhanced SWMP approach, by identifying and adopting waste objectives early on and incorporating waste minimisation into the design process, capturing those minimisation measures to feed in to the SWMP at the design stage, rather than considering waste as a site issue during the construction phase.
5	Minimisation of vehicle movements	Waste must be minimised and managed so as to keep on site waste arisings and associated vehicle movements to a minimum.
6	The project will aim for between 50-70% landfill diversion through reduction, reuse, recycling	This objective is in line with the Government's Strategy for Sustainable Construction (Ref 13.6) and the TZW (2010) Waste Strategy and would aspire to levels which would comply with forthcoming implementation of the 70% construction waste diversion target under the revised Waste Framework

	and recovery	Directive.
7	Early SWMP initiation	The SWMP approach should be adopted early in the design phase so that measures to minimise, reuse and recycle materials can be incorporated into the project delivery process and minimise impacts from the transport and subsequent disposal of waste during the construction phase
8	Consideration of climate change and the carbon agenda	Waste management should take into account the wider carbon agenda, considering fossil fuel consumption and the overall efficiency of recycling and recovery options. This objective incorporates transportation considerations and the proximity principle, whereby waste should be treated or recycled as near to the source as possible, if reuse back within the scheme is not possible.

13.2 Assessment Methodology

13.2.1 The general approach adopted for this assessment has been to consider the two phases of activity, (construction and operation) and the wastes likely to be created during each of them. The main focus has been on the strategic management of wastes from the proposed development and its construction, and demonstrating accordance with sustainable waste management principles and the methods for their delivery.

13.2.2 One of the key principles of modern waste management practice is founded on the advice contained in Towards Zero Waste (2010). This document sets out a hierarchy of waste management strategies for optimising the sustainable management of waste as shown above:

- minimisation: reduce the generation of waste at source;
- re-use: use materials elsewhere or in other processes without treatment;
- recycling: treat waste to remove recyclable materials;
- recover: maximise the value from waste streams from which recyclable materials have been taken (e.g. energy recovery); and
- disposal, usually to landfill.

13.2.3 These strategic principles underpin the approach adopted in this assessment.

13.2.4 Research and publications available from Waste and Resources Action Programme (WRAP) in relation to waste prevention and management generally identify what can be achieved in the design stages to design out waste rather than let it become a site management issue. Civil engineering projects usually require large quantities of materials and have the potential to generate large quantities of waste. Designing out waste can therefore bring significant cost reductions and environmental benefits. WRAP has developed a design team guide for civil engineering projects which provides a practical approach to successfully implementing the Designing out Waste principles in civil engineering projects.

Spatial Scope

13.2.5 The study area considered in the baseline assessment for waste management incorporates the scheme footprint as set out on the Illustrative Masterplan in Figure 2.1. The likely impact of various waste streams associated with the construction and operation of the proposed development on waste management targets and facilities in the south Wales area has also been considered.

13.2.6 During construction, most of the waste will be generated within the immediate environs of the construction site. Any materials that cannot be used on site will be sent off-site to appropriately permitted or exempt waste management facilities which are currently available within the south Wales area, for processing where appropriate, or for disposal. Such waste facilities will be identified in the SWMP.

Sensitive Receptors

13.2.7 Key sensitive receptors for the production of waste relating to the construction and operation of the proposed development are considered to be as set out in Table 13.3 below.

Table 13.3 – Sensitive Receptors

Resource/Receptor	Description
Local population	Includes local residents and businesses and users of the Mamhilad site
Waste receiving facilities	Includes recycling and sorting facilities, re-processors and waste transfer stations
Waste transportation providers	Includes waste haulage vehicles, waste carriers, skip container providers
Waste disposal facilities	Includes waste treatment facilities, landfill etc.

Methodology

- 13.2.8 There is no standard methodology for estimating construction waste arisings for the purposes of an EIA because volumes of construction waste are not determined at this early stage of the redevelopment process. This is difficult to do because different construction contractors use varying construction methods and materials which will generate differing amounts of waste.
- 13.2.9 As part of the construction process an assessment will be made as to whether CL:AIRE (Contaminated Land: Applications in Real Environments) Code of Practice (CoP) (Ref 13.7) is relevant for the proposed development. This is a way of identifying whether excavated materials are classified as waste or not and whether it needs to be determined if, when treated, the excavated wastes can cease to be classified as waste for a particular use. This may remove the requirement to apply for permits or exemptions in order to reuse the materials on site. The CoP requires a degree of self-regulation and relies upon a high level of professional integrity on the part of those involved.
- 13.2.10 The generation and handling of waste materials from the development is an important aspect of the environmental assessment and control. The environmental impacts will not be significant if:
- the management and mitigation measures identified are implemented;
 - there is diligent compliance with legislation and Duty of Care; and
 - there is regular monitoring and reporting.

Consultation

- 13.2.11 With regard to waste management, the Council's Scoping Opinion merely stated that *'the ES should include details of any waste arisings from the proposed development and the use of waste on site (if any).'*
- 13.2.12 With the exception of the consultation undertaken for the purposes of Scoping, no further external consultation was carried out specifically for the purposes of the waste management assessment.

Desk Study

- 13.2.13 The baseline scenario with regard to current waste arisings in the local and wider area, waste collection schemes, waste management facilities and disposal arrangements has been determined through a desk-top study, including the following sources:
- data from the BRE's (Building Research Establishment's) SMART waste system;
 - Natural Resource Wales website;
 - estimated quantities from the current design for the proposed scheme;
 - waste arisings data from national databases;
 - local policies relevant to waste management;

- topographical survey; and
 - benchmark data for construction waste.
- 13.2.14 The assessment of waste arisings during the construction works is based on available benchmark data for construction wastes, and considers the following:
- the creation of waste materials during construction activities, which may require off-site disposal. Some of the waste streams likely to be generated during the construction phase include concrete, wood, glass, metals, waste packaging (including cardboard and pallets) and residual general waste;
 - a decrease in local landfill capacity if construction materials are not segregated for reuse or recycling;
 - an increase in the use of virgin aggregate materials if no recycled or reclaimed materials are used in the construction process. Where the reuse of material on-site is not practicable as a sustainable alternative, preference should be given to the use of secondary aggregates and materials; and
 - any excavated materials surplus to requirements.

13.2.15 Construction waste is defined by the Wales Construction and Demolition Waste Generation Survey 2012 Technical Appendices (Ref 13.8) as:

“generated from the construction, repair, maintenance and demolition of buildings. It mainly includes bricks, concrete, subsoil and topsoil, but may also include wood, metal & plastics”.

Benchmark Recycling Target for Construction Wastes

13.2.16 Table 13.4 sets out a list of commonly used benchmark recycling targets for common construction waste streams likely to arise in this project.

13.2.17 The targets in the table are based on industry good practice and government guidance and are intended to support the overall objective to achieve 70% recycling across the whole project in line with the TZW (2010 target of 70% by 2025, the European Waste Framework Directive and established best practice. Benchmark targets can help steer and influence the waste management options in the SWMP and will be taken into account as the SWMP develops and the project progresses.

Table 13.4: Proposed benchmark recycling targets for key waste streams

Material	Common Constraints	Benchmark Recycling Target
Vegetation	Rooty soil difficult to separate Availability of local composting facilities	50%
Concrete	May be contaminated with oils, restricting recycling options	Up to 100% depending on condition and application
Drainage materials	Can be mixed with surrounding soils and gravels which could be contaminated	30% subject to onsite assessment and sorting during excavation
Earthworks	Cut and fill balance is constrained by topography and route. Reuse can be limited by condition and properties of cut, especially excavated soils impacted or contaminated by or subject to previous use	70% although 100% is achievable for similar schemes
General site waste e.g. office, H&S, welfare etc	Difficult to segregate and recover if mixed	50%

13.2.18 Parts of the Mamhilad Estate and the Parke-Davis site will require demolition, site clearance and excavation followed by the construction of new buildings and infrastructure.

Volume of Construction Waste

13.2.19 For the purpose of this assessment, three main data sources have been used to determine the volume of construction waste and are outlined below;

- data produced as part of the outline design and assessment process for the proposed scheme;
- data from the Building Research Establishment's (BRE) SMART waste system also uses the same Environmental Performance Indicator (EPI) [5]; and
- the Government body, Constructing Excellence, in conjunction with Movement for Innovation (M4I) publish a number of Environmental Performance Indicators (EPI) for use by the construction industry in benchmarking (and therefore improving) performance. M4I EPI report 2001 'EPI for Sustainable Construction' (Ref 13.9) is the most applicable for use in this assessment and measures construction waste in volume (m³) per 100m² or m³ waste per £100K of project value that is sent for disposal (i.e. not for recycling or reuse).

13.2.20 All the benchmarking data reviewed is based on a completed new build construction project and based on the construction phase only. It does not include demolition, excavation or groundworks waste. In addition, the majority of data is for buildings rather than civil engineering projects. Although BRE Waste Benchmarking Data issued 26th June 2012 (Ref 13.10) does show waste data for civil engineering projects, it does not include published information on the types of civil engineering projects.

Assessment Criteria

13.2.21 No standard criteria exist for assessing the significance of the potential effects that may arise from the generation of waste from the proposed development. Therefore, criteria have been derived for this assessment based on the guidelines in PPS 10 (now withdrawn) and any planning policies relating to waste management.

13.2.22 The assessment criteria are based on several factors, including:

- the 'treatability' of the waste generated by the scheme, which is determined by its physical and chemical characteristics (i.e. whether the waste can be treated with minimal residual waste, such as recycled waste, or whether the waste requires a specialised treatment with potentially hazardous residual waste);
- the availability of suitable facilities within the area to treat the waste generated;
- compatibility of the Best Practicable Environmental Option (BPEO) 1 (Ref 13.11) for the waste within the context of the waste hierarchy, i.e. whether generation of the waste can be minimised, the waste can be recycled, landfilled etc.; and
- potential environmental health effects or human health risks associated with the waste e.g. if it is hazardous etc.

13.2.23 A review of the Environment Agency website 'What's in your backyard?' (Ref 13.6) has been undertaken as there is no Welsh equivalent. This has indicated that the business waste directory shows that currently there are sufficient facilities for waste material to go to for processing and disposal. This will be clarified further in the SWMP and also the waste contractors appointed for the proposed scheme will have their own preferred sites.

Importance of Receptor

13.2.24 The significance of potential effects is a function of the presence and sensitivity of receptors and magnitude of the impact. Such effects include dust generated during waste removal operations, odour from biodegradable wastes, traffic due to the removal of wastes from site and the noise associated with the

handling of such materials. However, many of these effects that relate to waste management practices are covered in more detail within other sections of the ES, e.g. the air quality, transport and noise chapters for example.

- 13.2.25 The ecological environment could also be considered a receptor to waste generation and handling activities on site. The potential for effects on ecological receptors have been considered as part of the ecology chapter of this ES.
- 13.2.26 For the purposes of the waste assessment, the value/importance of the receptor has been classified as Low, Moderate or High as shown below:

Table 13.5: Scale for magnitude with respect to impacts on waste management receptors

Magnitude	Description
High	<ul style="list-style-type: none"> • Change in favourable conditions for reuse/recycling of materials, e.g. from reuse/recycling on or off site to disposal; • Generation of large volume of hazardous materials for disposal off-site; • Permanent impact on environment from material e.g. landfill; and • Significant increase in volumes of materials generated for removal and/or disposal off site from that estimated.
Moderate	<ul style="list-style-type: none"> • Generation of hazardous and non-hazardous materials for reuse/disposal off-site; • Temporary impact on environment; and • Minor increase in volumes of material for removal and/or disposal off site from that which was estimated.
Low	<ul style="list-style-type: none"> • Generation of inert and non-hazardous waste materials suitable for reuse on site; • No permanent impacts on the environment; and • No increase in volumes of material for removal and / or disposal off site from that estimated.

Magnitude of Effects

- 13.2.27 The magnitude of effects has been assessed according to the following scale:
 - Major (adverse) – large increase in the quantity of waste generated compared to existing levels, major constraints anticipated on the capacity of waste management infrastructure, the quantity of waste generated does not assist in the achievement of local and regional recycling and composting targets and significantly increases annual waste generation figures, waste is hazardous and requires incineration or landfilling resulting in permanent environmental effects, waste cannot be disposed of within south Wales.
 - Moderate (adverse) – moderate increase in the quantity of waste generated compared to existing levels, moderate constraints anticipated on the capacity of waste management infrastructure, the quantity of waste generated does not prevent the achievement of local and regional recycling and composting targets, waste is hazardous but can be recovered with pre-treatment resulting in temporary environmental effects, waste can be disposed of in south Wales.

- Minor (adverse) – small increase in the quantity of waste generated compared to existing levels, minor constraints anticipated on the capacity of waste management infrastructure, waste is non-hazardous or inert and can be recycled or composted within south Wales.
- Negligible – no significant change in the quantity of waste generated compared to existing levels.
- Minor (beneficial) – small decrease in the quantity of waste generated compared to existing levels, minor alleviation anticipated on the capacity of waste management infrastructure, waste in non-hazardous or inert and can be recycled or composted within south Wales
- Moderate (beneficial) – moderate decrease in the quantity of waste generated compared to existing levels, moderate alleviation anticipated on the capacity of waste management infrastructure, the decrease in the quantity of waste contributes to the achievement of local and regional recycling and composting targets and waste can be disposed of within south Wales.
- Major (beneficial) – large decrease in the quantity of waste generated compared to existing levels, major alleviation anticipated on the capacity of waste management infrastructure, significant decrease in annual waste generation figures and reduction in the need for incineration or landfilling which reduce permanent environmental effects, and the waste can be disposed of within south Wales.

Level of Significance

13.2.28 Each type of effect will be allocated a level of significance by assessing both their importance and the magnitude of effect, as shown in Table 13.6 below. The significance of an effect will be assessed based on the magnitude of the effects and the nature of the resource or receptor, taking into account the waste management options for the waste material either onsite or off-site.

Table 13.6: Evaluation of Significance

		Value of Receptor		
		Low Importance	Medium Importance	High Importance
Magnitude	Negligible	Not Significant	Not Significant	Not Significant
	Minor (adverse /beneficial)	Not Significant	Significant	Significant
	Moderate (adverse / beneficial)	Not Significant	Significant	Significant
	Major (adverse / beneficial)	Significant	Significant	Significant

13.2.29 The assessment also considers cumulative effects, where several types of effect act on the same resources and/or receptors. In some cases it may be that several “slight” effects may, individually, be insignificant but acting together may produce a significant effect on a sensitive receptor.

Assumptions and Limitations

Assumptions

13.2.30 The assessment of effects has been based on data sourced from relevant legislation and websites and information compiled as part of the outline design of the proposed scheme.

13.2.31 The assessment has been limited to the red line boundary relating to the proposed development and considers only construction, demolition and operational wastes, including maintenance.

Limitations

- 13.2.32 Given the early stage of this project, there is only initial information available relating to the quantity of construction and operational wastes that are anticipated to be produced during the construction and operation of the proposed development.

13.3 Legislative and Policy Context

- 13.3.1 There is extensive policy, legislation and guidance relating to waste management and waste management activities. The applicable legislative framework is summarised as follows:

- The Waste (England and Wales) Regulations 2011;
- The Environmental Permitting (England and Wales) Regulations 2010; (Ref 13.12)
- Revised Waste Framework Directive (2008);
- The Site Waste Management Plans Regulations 2008 (now repealed);
- The Hazardous Waste (England and Wales) Regulations 2005; (Ref 13.13)
- The Landfill (England and Wales) Regulations 2002 (Ref 13.14); and
- The Environmental Protection (Duty of Care) Regulations (1991) (Ref 13.15).

- 13.3.2 Current and proposed waste policies and targets, waste statistics and waste infrastructure that have been considered in further detail are outlined below

Planning Policy Wales Edition 9 - November 2016 (Ref 13.16)

- 13.3.3 Planning Policy Wales (PPW) sets out the land use planning policies of the Welsh Government.

- 13.3.4 With regard to waste management, PPW states the following:

'12.5.2 The Assembly Government's general policy towards waste management is based on a hierarchy of reduction, reuse and material recovery (including recycling and composting), energy recovery with effective use of waste heat, and safe disposal. A sustainable approach to waste management will require greater emphasis on reduction, re-use and recovery and less reliance on disposal without recovery, and the consideration of the Best Practicable Environmental Option (BPEO) which is one of the key mechanisms used to guide waste management options. BPEO is site specific and subject to local circumstances. The technique can be supplemented by assessment of the most sustainable waste management option (SWMO), which incorporates social and economic impacts.'

'12.5.3 Waste should be managed (or disposed of) as close to the point of its generation as possible, in line with the proximity principle. This is to ensure, as far as is practicable, that waste is not exported to other regions. It also recognises that transportation of wastes can have significant environmental impacts. The waste hierarchy, the proximity principle and regional self-sufficiency should all be taken into account during the determination of the BPEO for the network of waste management installations that provides the best solution to meet environmental, social and economic needs.'

'12.5.4 In Wales, the aim should be to provide sufficient facilities to treat, manage, or dispose of all the waste produced. Each local authority should consider what facilities are required to manage all waste streams generated within its area, although it may be necessary for some facilities (such as facilities for managing special or clinical waste) to be shared. Local authorities should co-operate through joint working arrangements to produce regional waste plans in order to provide Wales with an integrated and adequate framework or network of facilities that is actually achieved, thus meeting the requirements of the EC Directive. Local authorities should encourage any necessary movement of waste by rail and water rather than by road wherever economically feasible and have regard to the proximity principle.'

People, Places, Futures: The Wales Spatial Plan 2008 Update (Ref 13.17)

13.3.5 The purpose of the Wales Spatial Plan is to ensure that what is done in the public, private and third sectors in Wales is integrated and sustainable. It sets out cross-cutting national spatial priorities.

13.3.6 With regard to waste management, the Wales Spatial Plan states the following:

'16.59 Waste is a significant issue constraining the Area with landfill capacity rapidly reducing. North East Wales is failing to meet recycling targets and fly tipping is spoiling our countryside. The whole hierarchy from waste minimisation through collection, recycling and residual disposal has spatial implications. Working through the regional waste planning group, action will be taken to provide appropriate infrastructure and processes put in place to address the issues and provide opportunities for economic benefits from recycling and the development of new technologies.'

17.45 Indicative environmental and economic opportunities and priorities for action include:

Expanding activity in waste reduction, reuse and recycling to meet challenging legislative and policy targets by investment in infrastructure which includes sewerage and sewage treatment plants and new technologies.'

Towards Zero Waste: The Overarching Waste Strategy Document for Wales June 2010 (Ref 13.18)

13.3.7 Towards Zero Waste sets out how the Welsh Government will build on the successes achieved through Wise About Waste - The National Waste Strategy for Wales (2002). It sets out a long term framework for resource efficiency and waste management up until 2050. It identifies the outcomes the Welsh Government wishes to achieve, sets high level targets and lays out the general approach to delivering these targets and other key actions.

13.3.8 Wales is working towards two key milestones. These are

'2025: Towards zero waste - 2025 is an intermediate step on the way towards 'zero waste', which we define as an aspirational end point where all waste that is produced is reused or recycled as a resource, without the need for any landfill or energy recovery. By 2025, we will have significantly reduced waste through actions on sustainable consumption and production and will manage any waste that is produced in a way that makes the most of our valuable resources. This will mean that we will maximise recycling and minimise the amount of residual waste produced, and eliminate landfill as far as possible.'

2050: Achieving zero waste - As a minimum, we will reduce the impact of waste in Wales to within our environmental limits (which we define as 'one Wales: one planet' levels of waste, roughly 65% less waste than we produce now), aiming to phase out residual waste through actions on waste prevention and sustainable consumption and production so that the only waste that is produced is reused or recycled as a resource (thus meeting the aspirations of the 'zero waste' philosophy).'

Waste (Wales) Measure 2010

13.3.9 This Measure makes provision to reduce the amount of waste and litter in Wales and to contribute to the development of more effective waste management arrangements such as:

- The destination of proceeds from charges for single use carrier bags;
- Targets to be met by local authorities in relation to waste;
- Prohibiting or otherwise regulating the deposit of waste in a landfill; and
- Site Waste Management Plans for works involving construction or demolition; and for connected purposes. (

Technical Advice Note 21 (TAN 21) – Waste (2014) (Ref 13.19)

13.3.10 This Technical Advice Note is intended to facilitate the introduction of a comprehensive, integrated and sustainable land use planning framework for waste management in Wales. The movement towards

sustainable development in relation to planning for waste should be guided by principles on which any framework for waste management should be founded and the land use planning system has an important role to play in facilitating sustainable waste management and should:

- provide a planning framework which enables adequate provision to be made for waste resource management facilities to meet the needs of society for the reuse, recovery and disposal of waste;
- encourage sensitive waste management, enhance the overall quality of the environment and avoid risks to human health;
- have regard to the need to protect areas of designated landscape and nature conservation value from inappropriate development;
- have regard to the need to protect the amenity of the community and of land uses and users affected by existing or proposed waste management facilities;
- minimise adverse environmental impacts resulting from the handling, processing, transport and disposal of waste;
- consider what new facilities may be needed, in the light of waste forecasts; and
- ensure that opportunities for incorporating reuse/recycling facilities in new developments are properly considered.

Regional Policy

Strategic Planning Guidance for South East Wales (July 2001) (Ref 13.20)

- 13.3.11 This Strategic Planning Guidance for the South East region of Wales provides the regional framework for planning in the South East and provides specific recommendations in relation to waste management. The guidance stipulates that through reducing the amount of waste which is created and by recycling or recovering waste there is an opportunity to reduce the need for basic raw materials; to replace some traditional sources of energy and raw materials; and to reduce the need to dispose of waste through landfill.

South East Wales Regional Waste Plan - 1st Review (2008) (Ref 13.29)

- 13.3.12 The Regional Waste Plan provides a strategic, integrated, approach to waste management and resource recovery for South East Wales and has a number of specific objectives for the region, of which TCBC is committed to, and includes the following:
- To achieve the 2020 Landfill Directive targets by 2013;
 - Achieve this principally through maximising recycling and composting;
 - Deal with residual waste by Mechanical Biological Treatment;
 - Choose between either sending the residual waste from Mechanical Biological Treatment to landfill or using it as Refuse Derived Fuel; and
 - Limit the amount of waste going to landfill to that which cannot be dealt with acceptably in any other way.

Local Policy

Torfaen County Borough Council Deposit Local Development Plan (to 2021) (December 2013) (Ref 13.23)

- 13.3.13 The Torfaen Deposit Local Development Plan (LDP) sets out the development strategy, land use allocations, and detailed policies and proposals for the future development and use of land in Torfaen.

Torfaen Waste Management Strategy (2004) 'Watch Your Waste'

- 13.3.14 At present Torfaen is producing its Waste Management Strategy which will set out a challenging programme for waste management (which will be reviewed every 3 years). The purpose of this Strategy is to ensure that Torfaen moves away from an over-reliance on landfill and towards a more sustainable approach to waste management. The objectives of 'Watch Your Waste' are:
- To enable Torfaen to be a model for sustainable waste management through implementing an integrated approach to waste management. Providing sustainable solutions for the environment. Thereby, providing a better quality of life for the citizens of Torfaen; and
 - To ensure that the policies and related actions with regards to municipal waste collections and disposals undertaken by Torfaen County Borough Council meet the legislative requirements of the European Union, the UK Government and the policy requirements of the Welsh Government.

13.4 Baseline Conditions

Introduction

- 13.4.1 The proposed area for development currently comprises both greenfield and developed land. At present there is no baseline information relating to waste arisings currently generated from the existing agricultural use (of the greenfield parts of the site).
- 13.4.2 The remaining brownfield areas are the Mamhilad Estate, including the former Nylon Spinners Factory, and the former Parke-Davis pharmaceutical factory, which are predominantly hardcovered with large car parks and interspersed landscaped areas.

Construction Arisings

- 13.4.3 As evidenced in the previous legislative and policy section, one of the key objectives of waste policy in Wales (Ref 13.23) is to develop a sustainable approach to the management of waste.
- 13.4.4 A survey conducted by the Environment Agency (Building the Future, 2005-06) (Ref 13.24) revealed that Wales produced 12.2 million tonnes of construction and demolition waste (C&D) in 2005-06. Over half of the C&D waste arising in Wales arose in South East Wales (51%).
- 13.4.5 Regarding non-inert C&D waste, the 2007 Waste & Resources Action Programme (WRAP) report 'Recycling Rates for Non-Inert C&D Waste', states that:
- 'the annual tonnage of non-inert C&D waste arising in Britain probably lies about half way between two contrasting pre-existing estimates (of 7.5 million and 22 million tonnes per year).'*
- 13.4.6 This supports the view that definitive figures to accurately quantify non-inert Construction, Demolition & Excavation (CD&E) waste arisings are not currently known.
- 13.4.7 Based on current working methods, a significant opportunity exists for segregating non-inert CD&E waste streams for reuse/recycling at the site. It is likely that the key waste streams generated by the demolition and construction phase of the development that have the potential to be reused/recycled will predominantly comprise soils, concrete, bricks, metal, glass, plastic and timber.
- 13.4.8 It is anticipated that waste treatment and recycling facilities, inert, non-hazardous and hazardous landfill sites would be the main receptors during the site preparation, earthworks and construction phase of the proposed development. These receptors are collectively referred to as waste management infrastructure within this chapter.

13.5 Assessment of Effects, Mitigation and Residual Effects

Construction

13.5.1 In relation to identifying waste streams and assessing environmental effects, the proposed development can be divided into the following key stages:

- Demolition, Site preparation and Excavation (Enabling works);
- Substructure;
- Construction of buildings; and
- External works.

Demolition, Site Preparation and Excavation (Enabling Works)

13.5.2 It is proposed that the site will be re-profiled during the enabling works. The estimated volumes and scope of demolition have not been determined to date. However, there is likely to be an excess of soil arisings. In the first instance the potential to reuse this material on-site will be explored in order to remove or minimise the volume of surplus material to be disposed of. The potential to dispose of surplus material off-site to an appropriate recycling facility will then be investigated from where it can be redistributed to an alternative site for use as fill material. Only as a final resort will any surplus material be disposed of via landfill as this is the worst case scenario and is likely to cause a minor negative effect on landfill capacity.

Mitigation

13.5.3 In order to plan for the minimisation and management of the volume of earthworks waste generated, the appointed Principal Contractors will prepare Site Waste Management Plans (SWMPs) for the proposed development, including measures to minimise waste generation and reduce the amount of waste being sent for disposal where possible. Whereas this is advised, this is not a statutory requirement.

13.5.4 Material deemed suitable for reuse within the proposed development will be retained and stockpiled where possible so that it can be incorporated into the subsequent construction processes.

13.5.5 If materials cannot be reused on-site, then the feasibility of reusing them off-site will be explored. Schemes exist which encourage the exchange of waste materials, with the intention of diverting quantities from landfill. One such scheme is the National Industrial Symbiosis Programme (NISP) which is operational in Wales. This involves identifying waste streams which could successfully be used by other businesses or operations. This results in the diversion of waste from landfill and thus presents the potential for cost savings.

13.5.6 The Principal Contractors will establish a number of key performance indicators (KPIs) specifically for waste management which will be regularly monitored.

13.5.7 During this phase, the existing buildings and areas of hardstanding will generate significant quantities of waste materials, some of which will have the potential to be used beneficially as recycled aggregate following processing. Such wastes may include:

Building rubble	Plastics
Timber	Insulation Materials
Glass	Soft furnishings/ fittings
Plaster	Asbestos
Ceramics	Ferrous and non-ferrous metals

13.5.8 Estimated likely amounts of waste have yet to be determined. It is anticipated that demolition operations, without the implementation of appropriate mitigation measures (to identify and segregate materials suitable for reuse on-site for temporary works during the construction process or segregate materials for recovery and recycling off-site), will result in an effect considered to be of minor negative significance on landfill capacity.

- 13.5.9 It is anticipated that various waste-related streams will be generated during each of the demolition phases and will need to be appropriately managed to ensure that excessive waste streams are not disposed of via unsustainable methods, principally landfilling.
- 13.5.10 From such demolition arisings, there is potential for a percentage of the material to be recycled as aggregate materials for use within the development works, including;
- Concrete;
 - Brick/blockwork; and
 - Asphalt.
- 13.5.11 Ferrous and non-ferrous metals have intrinsic value for recycling as scrap metals, crushed concrete and brick can be used on-site as temporary haul roads or pile mats, and timber shutters can be reused on-site as protective decking. However, on-site processing of demolition concrete and brick is likely to require a mobile plant licence and stockpiling of greater than 100tonnes of construction waste may require a waste management license exemption from NRW.
- 13.5.12 The recycling and reuse of these materials on-site is the most environmentally sustainable option. It should be noted that identifying demolition arisings as 'potentially recyclable' does not necessarily imply that the materials can be successfully recycled. Successful recycling is dependent upon several factors, including:
- Quantity of materials produced;
 - Cleanliness of materials;
 - Absence of contaminants;
 - Market demand for materials;
 - The relative costs of demolition, processing, recycling and disposal; and
 - The time-scale allocated for demolition/redevelopment operations at the site.
- 13.5.13 Due to the age of the buildings on-site, it is possible that asbestos containing materials (ACMs) will be present. Hazardous materials such as asbestos will need to be removed by specialist contractors and disposed of to an appropriately licensed facility. It is therefore anticipated that demolition, without the implementation of appropriate mitigation measures to establish safe disposal of hazardous materials, will result in a minor negative effect on landfill integrity and adherence to legislation.
- 13.5.14 All ACMs will be removed by a licensed contractor following appropriate guidance and safe working procedures and safe disposal methods.
- 13.5.15 The measures outlined to encourage on-site good practice and reduce the quantity of construction waste from the on-set of redevelopment comprise the following measures:
- 13.5.16 Measures to reduce the effects of construction waste will be covered within the Construction Environmental Management Plan (CEMP) and the SWMPs. They will identify the need for the briefing of the on-site workforce and sub-contractors on the importance of the minimisation, segregation and recycling of waste and will ensure that adequate storage facilities are provided on-site for the construction phase.
- 13.5.17 The SWMP will ensure that a clear action plan is generated for the specified types and quantities of materials that are required for each of the stages during the construction phase. It will enable appropriate targets and objectives to be set in relation to the minimisation and recycling of any waste materials during each stage of the construction phase.
- 13.5.18 As part of the CEMP, recommendations will be provided on the need for the proposed development to adhere to the sustainable selection of materials from the current Building Research Establishment (BRE) Green Guide for Specification (2008) (Ref 13.25) which is available online. Contractors would need to be committed to the operation of best practice measures on-site with the emphasis on continual improvement, identifying appropriate opportunities to reduce waste and promote recycling and the use of recyclable materials.

13.5.19 As part of the CEMP, the presence of a Construction Manager responsible for overall implementation and compliance issues on-site will also be required. During the initial stages of development, it is important to emphasise the minimisation of waste through appropriate working practices including the adoption of a suitable code of practice in the form of a Considerate Constructors Scheme'. Such a code of practice would be required to ensure that sustainable construction practices are adopted and waste management practices are implemented that identify measures to minimise and reduce waste from the outset.

On-Site Working Practices and Responsibility

13.5.20 The generation of waste on-site during both construction and operation will be minimised as far as possible. Good working practices will be employed on-site in relation to the storage and disposal of waste materials. The selection of waste management options will follow the principles of the waste hierarchy and selection of the Best Practical Environmental Option (BPEO).

13.5.21 All the contractors, sub-contractors and suppliers will be contractually obliged to participate in the waste management practices at the site. The details of the contractor's proposals for waste minimisation will need to satisfy the scheme's requirements and will be monitored by the Construction Manager. This commitment will be required to ensure the success of the waste management practices. The contract terms will need to include a commitment to the waste management priorities for the site that focus on reducing waste, reusing materials and recycling waste materials in order to minimise disposal to landfill.

13.5.22 As part of the CEMP, emphasis would need to be placed on the minimisation and reuse of material throughout the construction process in accordance with Government policy. The presence of an appointed Construction Manager will ensure that maintaining on-site compliance, monitoring of health and safety and maintaining good on-site working practices, including good storage and waste management practices at the site, is achieved.

13.5.23 There will be a commitment to minimising construction waste by adopting good site practices including waste management initiatives that maximise material use and keeps waste to a minimum. The location of waste management compounds on-site will be carefully planned to minimise disturbance to surrounding receptors and to ensure ease of access for contractors. A waste management contractor will need to be appointed for management of waste throughout the construction process with a brief to reduce and recycle construction waste from the outset.

13.5.24 The contractual commitments would be needed to promote and encourage increased awareness and initiatives to minimise waste at the site and to develop more sustainable working practices and design principles to minimise waste before it is generated, resulting in a more proactive, sustainable approach t. The recommended good working practices that would be required as a means of minimising waste include:

- 'Just in time' system for the efficient planning of material deliveries to the Site by contractors and sub-contractors to avoid damage to the materials and the unnecessary generation of waste from materials spending too long being stockpiled;
- Stockpile areas for surplus material and top soil areas which will need to be covered or vegetated as soon as practical to reduce the potential of exposed surfaces being picked up by the wind and the wastage of reusable material;
- Effective co-ordination between contractors and suppliers to avoid the excessive purchase of raw materials to prevent the risk of materials being lost, stolen or damaged; and
- Effective handling and storage of delivered materials to prevent loss or damage through exposure to the weather, mud and on-site vehicles. This may include vehicles carrying loose aggregate and workings to and from the site being covered at all times and, the provision of wheel washing facilities for construction vehicles departing from the site.

Reducing On-Site Wastage

- 13.5.25 As there is a considerable amount of buildings and hardstanding on site, opportunities exist for the potential reuse of concrete rubble from the demolition of these existing structures and buildings. A principal objective at the early phase of the development would be to minimise the use of primary aggregate materials. The potential may also exist for the reuse of material generated during the site clearance stage to form haul roads and for landscaping and screening purposes during this phase.
- 13.5.26 During the demolition stages, the waste management priorities for the demolition of existing buildings and structures at the site would need to remove potentially contaminative material and reduce potential wastage through the reuse and recycling of materials to minimise disposal to landfill. Potentially contaminative material, including ACMs, will be identified and these will need to be removed by specialist contractors. The material would need to be disposed of with consent from NRW to an appropriate waste management facility that is licensed to receive the waste under the Landfill Directive.
- 13.5.27 In addition, as part of the CEMP and SWMP, all materials suitable for reuse would need to be identified and removed during the stripping works and segregated out into colour-coded waste skips for reuse/recycling including ferrous and non-ferrous material, timber, plastics, glass, fixtures and fittings. Maintaining such segregation practices at the site for recovered materials is an essential part of the good practice measures that would need to be encouraged at the site.
- 13.5.28 As part of the CEMP and SWMP, it will be recommended that during each stage of the construction process, contractual commitments are implemented to ensure that compliance with on-site waste management practices are adhered to so that relevant waste management targets for recycling are achieved. The waste practices encouraged for the construction stages would be outlined in the CEMP and SWMP and would be based on the principles of a waste hierarchical approach, placing emphasis on the reduction of waste at source followed by reuse and recycling throughout each stage of the construction process. Waste arisings that have the potential to be segregated for recycling include wood (including pallets and timber off-cuts), plastics, ferrous and non-ferrous metals, cardboard, packaging waste including bubble wrap and shrink wrap, and small quantities of residual glass waste. The Waste Management Strategy will outline the skips to be provided. There will be segregation of gypsum, inert, mixed, wood, hazardous, metal and packaging and each skip will be colour coded.
- 13.5.29 Whilst promoting the recommended waste practices to be implemented for the construction stages, the CEMP and SWMP would also promote the importance of waste minimisation, reuse and recycling. This would include the need for the provision of 'Tool Box Talks' to ensure that all the workforce and sub-contractors are informed of the importance of minimising waste at source. This would also raise awareness amongst the workforce on the location and purpose of facilities that are available on-site for the segregation of certain waste stream types for reuse/recycling.
- 13.5.30 As part of the CEMP and SWMP, a key measure will involve the planning and consideration of materials during the construction process where contractors will be encouraged to select materials from the current BRE Green Specification Guide (2008). This would enable preference to be given to construction specifications and selection of materials for external walls, roofs and landscaping and to internal elements such as partitioning, raised floors, insulation and doors. Such specification criteria would aim to ensure that there is a further reduction in the environmental effect in the selection of construction raw materials giving preference to materials with high environmental performance.
- 13.5.31 As part of the waste management practices on-site, the CEMP will recommend that suppliers of materials to the proposed development will need to be committed to reducing any surplus packaging associated with the supply of any materials. This includes the reduction of any unnecessary surplus packaging such as plastics (shrink wrap and bubble wrap), cardboard and wooden pallets. This may involve improved procurement and consultation with selected suppliers regarding commitments to waste minimisation, recycling and the emphasis on continual improvements in environmental performance. Table 15.4 summarises the most important ways to minimise the potential waste of on-site materials during construction.

Table 15.7: Measures to Reduce the Wastage of On-Site Materials

Ordering	Delivery
Avoid: Over-ordering (order 'just on time') Ordering standard lengths rather than lengths required Ordering for delivery at the wrong time (update programme regularly)	Avoid: Damage during unloading Delivery to inappropriate areas of the Site Accepting incorrect deliveries, specification or quantity
Storage	Handling
Avoid: Damage to materials from incorrect storage Loss, theft of vandalism through secure storage and on-site security	Avoid: Damage or spillage through incorrect or repetitive handling

13.5.32 Therefore, there are opportunities to minimise the amount of material wasted on-site. There is potential that the implementation of such measures as outlined above would have a minor positive effect.

Adequate On-Site Storage

13.5.33 Suitable storage facilities should be provided at the site for those waste streams that can be segregated for recycling or reuse and for general waste to be disposed of via landfill. Waste construction materials for recycling will be transferred to the appropriate waste transfer station, which would accept various construction waste materials. Suitable storage facilities would be required on-site which are clearly labelled and such facilities would include:

- Temporary offices and work compounds on-site to retain all details relating to the management of waste at the Site;
- Storage areas for raw materials and assembly areas for construction components located away from sensitive receptors;
- Any fuels, oils and chemicals that are used on-site would need to be stored in appropriate containers within a secure bunded compound in accordance with good site practice and Environment Agency guidelines (Pollution Prevention Guidance Note 6: Working at Construction and Demolition Sites (Ref 13.26). Such areas will need to be located away from sensitive receptors, e.g. residential and ecological receptors, watercourses and surface water drains.
- Well-labelled skips for individual segregated waste streams for reuse and recycling as outlined in the Waste Management Strategy;
- Dedicated skips for any residual construction waste that require off-site disposal; and
- Any hazardous waste materials would need to be stored in a secure, bunded compound in appropriate containers and be clearly labelled to identify their hazardous properties and be accompanied with the appropriate Control of Substances Hazardous to Health (COSHH) assessment sheets.

13.5.34 It is important that good practice for the storage of materials is adopted to ensure that any potential waste generation is avoided from the outset. Effective segregation of waste streams for reuse and recycling is a key mitigation measure in preventing the amount of unnecessary waste that may be disposed of to landfill.

Waste Targets / Audits

13.5.35 The Construction Manager (or representative) will set waste targets for the site and will undertake waste audits at regular intervals focusing on:

- Whether any improvements in current working practices can be made;
- Quantifying raw material wastage;
- The quantities of each waste stream being generated;

- The ways in which the waste streams are being handled and stored; and
 - The waste disposal routes currently used e.g. landfill, recycling centres.
- 13.5.36 Conducting an audit of this nature will enable the Construction Manager to determine the achievement of set targets and the success of current waste management initiatives employed on the site.
- 13.5.37 In addition, the contractor will be expected to:
- Join the Considerate Constructor's Scheme and adhere to the scheme's codes;
 - Manage the Site so that building waste is disposed of by a means which will minimise adverse effects on the local area;
 - Remove and dispose of ACMs in buildings, in advance of demolishing buildings which contain asbestos; and
 - Adhere to the Code of Construction Practice in order to prevent increased litter on the Site during the construction phase.

Residual Effects

13.5.38 Provided that the aforementioned mitigation measures and other good practice measures are adhered to, any residual impacts will be of negligible significance on landfill capacity. Any hazardous waste would also be likely to have a negligible effect on landfill integrity.

Substructure

- 13.5.39 Excavated soil material will be generated from the construction processes. The total amount of excavated soil has yet to be determined and only will be when detailed design has been finalised.
- 13.5.40 There would be a minor to moderate negative effect on landfill capacity from disposal of soils to landfill should soils from earthworks not be suitable or required for use on-site.

Mitigation

- 13.5.41 It is estimated that the majority of excavated soil will be reused for site profiling and soft landscaping. The remainder should be sent to a recycling facility where it can be redistributed to an alternative site that requires fill material.
- 13.5.42 The end destination of the soil material would be dependent on appropriate chemical testing. If the material is not contaminated, it could either be reused on-site for profiling/soft landscaping or sent to a waste transfer station that accepts uncontaminated soil material for redistribution as fill material on other sites. Any uncontaminated material which cannot be used on other sites would be transported via the road network to a licensed inert landfill site for disposal. If contaminants are found in the spoil, it would be transported via the road network to a licensed hazardous waste landfill site for disposal.

Residual Effects

13.5.43 With the use of the aforementioned mitigation measures, waste arisings from earth works would have a direct, permanent, long term effect of negligible significance on landfill integrity and legislation.

Construction of Buildings

13.5.44 The generation of waste construction material will occur at all stages of the construction process from structural and foundation works through to the construction of the building envelope and internal fittings and electrical installations. During such phases, there is the potential to generate a wide range of wastes such as:

Concrete	Cardboard
Waste roofing material	Pallets
Wood	Wood off cuts
Metal	General Site waste

Plastics (including shrink and bubble wrap)	Packaging
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- 13.5.45 During construction, the existing buildings and areas of hardstanding will generate significant quantities of waste materials, some of which will have the potential to be used beneficially as recycled aggregate following processing. Modern construction and demolition material recovering facilities (MRF) have high recovery rates of recyclable materials (aggregates, soil fines, wood, metal and card) with recovery and reuse of up to 90% of the material received.
- 13.5.46 The Building Research Establishment (BRE) has developed indicators to aid in the calculation of construction waste arisings at the design stage of a variety of development types. These indicators do not include demolition, excavation or groundworks waste. The Environmental Performance Indicator (EPI) measures tonnes of construction waste per 100m² of floorspace.
- 13.5.47 With regards to the proposed development, the most relevant Project Type for which the EPI would be applied would be 'Residential'. This is outlined in Table 15.8.

Table 15.8: BRE Waste Benchmark Data for New Build Construction

Project Type	Average m ³ /£100k
Residential	18.3

- 13.5.48 This indicator could be used to measure construction waste generated from the proposed development when detailed scheme design has been completed and can be related to waste generation rates where no minimisation, reuse or recycling of materials has taken place. This would provide the baseline figure against which a reduction in waste arisings can be calculated.
- 13.5.49 The estimated waste arisings data can be used as an indicator for measuring and monitoring the volume of waste generated. This will enable the setting of realistic and attainable waste minimisation and management targets.
- 13.5.50 It is anticipated that construction operations, without the implementation of appropriate mitigation measures (to identify and segregate materials suitable for reuse on-site for temporary works during the construction process or segregated for recovery and recycling off-site), will result in an effect that is considered to be of moderate negative significance on landfill capacity.

Mitigation

- 13.5.51 Mitigation measures will be similar to those outlined in paragraphs 13.5.15 to 13.5.40.

Residual Effects

- 13.5.52 Following the implementation of suitable mitigation measures, the residual effect from the construction phase (including undertaking external works) would be reduced to negligible. The implementation of good on-site working practices including the effective ordering, handling and storage of raw materials will help to reduce wastage on-site and to achieve a target that is better than the national average.

External Works

- 13.5.53 The external works will involve the completion of external hardstanding surfaces, landscaping, and site reinstatement. During these works, it will be important to ensure that wastage is kept to a minimum and any waste materials generated during the final clearance of the site should be segregated for recycling or disposal at landfill.
- 13.5.54 If found on-site, without appropriate management and disposal, any contaminated waste arisings would produce a moderate negative effect in relation to landfill integrity and adherence to legislation.
- 13.5.55 There would be a minor to moderate negative effect on landfill capacity from disposal of soils to landfill.

Mitigation

13.5.56 Mitigation will be the same as those outlined in paragraphs 13.5.15 to 13.5.40.

Residual Effects

13.5.57 Following the implementation of suitable mitigation measures, the residual effect from the external works would be reduced to negligible.

Operation

13.5.58 The key waste types predicted to be generated from the proposed development , the new build elements of which will be primarily be residential, when operational will comprise the following:

Organic food waste
Cardboard
Paper
General recycling
Landfill Domestic Waste

13.5.59 A number of the waste streams will comprise both general waste and segregated recyclables. However, should appropriate segregation practices be implemented and be readily available to residents, the quantity of the general waste stream can be reduced.

Mitigation

Waste Management Strategy

13.5.60 An Operational Waste Management Strategy will be produced in accordance with the Waste and Recycling Service Standards for Torfaen County Borough Council.

Residual Effects

13.5.61 For the operational phase, the implementation of an effective Operational Waste Management Strategy would significantly reduce waste generation. The User Guide for the site would set out the fundamental principles of the action plan and programme for the site users to address waste issues on-site. Good waste management practices at the proposed development will also have a positive contribution at the regional level to reducing the quantities of material disposed of to landfill and waste to energy facilities.

13.5.62 With an effective recycling system at the development and adoption of a recycling target of approximately 40%, there is significant potential to recycle large portions of the expected waste from the proposed development. Continuing with the recycling strategy once the proposed development is established it would contribute towards achieving the Welsh Government targets of a recycling rate of at least 58% by 2015-16 rising to 64% by 2020 and would have a minor negative effect.

Monitoring and Follow Up

13.5.63 It is recommended that a programme of monitoring be carried out during the demolition, construction and operational phases of the proposed development to identify the different waste streams and where the most waste is generated. The advantage of waste monitoring is that it can assist in identifying material wastage and the key types of waste streams generated and ways in which such waste streams can be effectively managed and disposed of in accordance with current legislation, policy and best practice guidance.

13.5.64 During the operational phase, identification of waste monitoring will allow for a programme of waste targets to be set to aid in waste minimisation and recycling within given timeframes. It is anticipated that the application of a programme of waste monitoring over time will lead to significant waste reductions.

Limitations and Assumptions

13.5.65 It should be noted that there is presently no standard criteria for assessing the significance of effects of solid waste arising from development. Therefore, in order to assess magnitude and the significance of the potential effects that may arise as a result of waste generated from the proposed development, specific assessment

criteria were generated. The significance effect criterion are based on the guidelines set out in TAN 21 and local policy relating to waste management.

13.5.66 The assessment of the significance and magnitude of changes in the quantity and types of waste likely to be generated by the proposed development is based on currently available information relating to existing and proposed future waste management facilities and waste generation within TCBC. The assumptions and limitations applicable to the assessment are as follows:

- The assessment has been based on current waste policy (at national, regional and local levels);
- There is uncertainty on estimating the likely volume of waste produced during the demolition phase of the proposed development.
- It is considered unlikely that waste management services of TCBC will be used during the demolition and construction phase. This phase of the proposed development would be expected to be contracted out to a specialist contractor and the capabilities of the contractor selected will have an effect on the recovery of recyclable materials;
- The management options available for waste generated at the site are determined by factors beyond the control of this assessment and are dependent on the provision of suitable waste management facilities, commercial waste management considerations during construction and private waste management companies.

13.6 Assessment of Cumulative Effects

Solid Waste Management

- 13.6.1 There will be an increase in the quantity of both demolition and construction waste generated in Torfaen, due to the proposed residential developments and in particular the development of other strategic sites.
- 13.6.2 There is the potential that materials generated at one site could be reused on another and this should be investigated further, possibly through the use of SmartWaste modelling tools and services developed by the Building Research Establishment (BRE), or the National Industrial Symbiosis Programme (NISP) which aims to develop improved efficiencies in the disposal of waste resources. The cumulative effect of developments during the construction period on landfill capacity is likely to be of minor negative significance. Although best practice waste management techniques are likely to be conducted at the other sites, residual waste streams that cannot be recovered for reuse or recycling will still need to be landfilled. There would however be a negligible effect on local authority waste management facilities and infrastructure as private contractors will be used to manage, segregate and dispose/recycle/reuse the waste during the construction period.
- 13.6.3 The cumulative effects of the operational waste generated by the proposed development and other sites on local authority local and regional waste management infrastructures is likely to be negligible as TCBC should plan for the additional service requirements when developing future waste and resource management facilities for the county in order to meet their regional and national waste minimisation targets.
- 13.6.4 Any hazardous waste produced would have to be disposed of in accordance with legislation. Therefore, there should be a negligible cumulative effect on landfill integrity as a result of the developments in the area.

Table 15.9: Summary of Effects Table for Waste Management

Description of Likely Significant Effects	Significance of Effects					Summary of Mitigation / Enhancement Measures	Significance of Residual Effects				
	Major, Moderate, Minor, Negligible	Positive / Negative	P/T	D/I	ST/MT/LT		Major, Moderate, Minor, Negligible	Positive / Negative	P/T	D/I	ST/MT/LT
Excessive waste to landfill during internal strip out operations and demolition of the existing buildings.	Minor	Negative	P	D	LT	Materials audit to identify recyclable materials and reuse opportunities. Waste segregation at source and effective site waste management plans.	Negligible	N/A	P	D	LT
Hazardous materials from demolition and construction mixed with re-usable/ inert recyclable waste.	Minor	Negative	P	D	LT	Hazardous materials survey and licensed removal and disposal of all hazardous materials identified on the Site.	Negligible	N/A	P	D	LT
Contaminated soils from earthworks not being disposed of in accordance with legislation.	Minor	Negative	P	D	LT	Licensed removal and disposal of contaminated materials as hazardous waste.	Negligible	N/A	P	D	LT
Excessive off-site disposal of soil arisings to landfill from basement and foundation excavations and landscaping works.	Minor to Moderate	Negative	P	D	LT	Reuse clean arisings on-site for communal open spaces, borders and landscaping where possible. Minimise material required for off-site disposal.	Negligible	N/A	P	D	LT
Excessive production of waste construction materials and internal fit-out and external works.	Moderate	Negative	P	D	LT	Waste segregation at source, and enforcement of SWMP in accordance with the waste hierarchy.	Minor	Negative	P	D	ST
Effect on local road network.	Moderate	Negative	T	D	ST	Waste segregation at source, recycling and reuse of materials, CEMP and SWMP.	Minor	Negative	T	D	ST
Minimising effects of waste management on local residents.	Minor to Moderate	Negative	T	D	ST	Waste segregation at source, CEMP and SWMP, site security and materials.	Minor	Negative	T	D	ST
Reducing waste to landfill from proposed on-site uses.	Moderate	Negative	P	D	LT	An Operational Waste Management Strategy has been produced for the Proposed Development and takes into consideration national, regional and local	Negligible to Major (depending	Negative	P	D	LT

						<p>policies and targets as well as Gwent NHS Waste Management Policy and associated control procedures.</p> <p>The Waste Management Strategy provides procedures for the storage and separation of different types of waste, especially hazardous and non hazardous waste streams.</p>	on the year after operation)*				
Disposal of hazardous wastes.	Moderate	Negative	P	D	LT	Licensed removal and disposal of all hazardous materials identified.	Minor	Negative	P	D	LT

Key to table:

P/T = Permanent or Temporary, D/I = Direct or Indirect, ST/MT/LT = Short Term, Medium Term or Long Term

N/A = Not Applicable

Consultation Draft

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