

18 Waste Management

18.1 Introduction

Wastes are an inevitable aspect of any business activity. These are evident with the current site operations and also will be with the redeveloped site, but there will be two aspects to waste management associated with the redevelopment. Firstly one off wastes will be generated during the construction phase. Secondly, once the site is developed and operational there will be regularly occurring routine wastes associated with the activities of the tenants and site users.

There is a great deal of regulatory and financial pressure to manage wastes effectively and avoid landfill disposal where possible. The applicant has considered this in the context of the proposed development and assessed the waste characteristics of the current site use and the proposed development in order to try and evaluate potential impacts and identify options for sustainable waste management.

18.2 Legislation and Policy Context

18.2.1 National Policy

Historically, waste management during the construction phase of a project was governed by *The Site Waste Management Plans Regulations 2008*. These regulations were repealed on the 1st December 2013; therefore there is no longer a legal requirement for the main contractor to produce a Site Waste Management Plan (SWMP). Recognising this position, for this project the developer will require the main contractor to adopt an agreed Resource Management Plan which, in addition to waste management, will also set criteria for the management of energy, water and materials.

Waste management during the occupational phase of the project is governed by the *Waste (England & Wales) Regulations 2011* which sets out specific legal duties for waste producers and managers.

18.2.2 Regional Policy

There are no regional policies that are relevant to this chapter.

18.2.3 Local Policy

In April 2012 Birmingham City Council published “Refresh of Municipal Waste Management Strategy” which seeks to promote recycling and energy recover for municipal wastes that fall under the responsibility of the City Council. The Waste Management Strategy (2006 – 2016) has the following five objectives:

- The Council will explore ways of reducing the amount of waste sent to landfill to an absolute minimum, recovering value from waste wherever economically and environmentally practicable through energy recovery and measures to increase re-use, recycling and composting;
- The City Council and its partners will raise awareness among the wider community to view waste as a resource and will deliver communications activities and work with relevant stakeholders (such as community groups and schools) to promote the cultural change needed to significantly increase recycling and re-use and reduce the overall quantity of waste requiring treatment or disposal;
- The City Council will develop recycling and composting systems that meet the targets set out in this strategy through methods that are acceptable and accessible to the residents of Birmingham;
- The City Council will explore ways of working with other local authorities and will expand its partnership activities with the private and voluntary sectors to assist in delivery of this Strategy; and
- The City Council will work with its partners and other agencies to provide efficient and effective enforcement of its services to contribute to a clean, green, safe and healthy environment.

This in effect creates the recycling and collection regimes that the occupiers of the residential units of the proposed development would be expected to comply with and which the development design would need to facilitate.

18.3 Assessment Methodology and Significance Criteria

The waste management evaluation has considered the wastes that are likely to be generated as a result of the site usage for its normal business (current and planned) and the construction site preparation related wastes.

The methodology for looking at operational wastes has simply involved examining waste management practices on the site and where possible predicting waste generation activities associated with the redeveloped site. The Developed site will not have a centralised waste management contract for commercial tenants as it is anticipated that the tenants will have national contracts and waste management packages with different waste management companies that would take precedence over any site-based solution. Wastes generated as a result of the residential aspect of the development will be collected by Birmingham City Council. Given this and the fact that the future tenants for the development are not fully known at this stage, only general discussion can be provided and general sustainable waste management principles be put forward as part of the tenants requirements. In essence, however, it is only the waste volumes that cannot be predicted at this stage, the nature of the wastes and the opportunities for sustainable waste management are well understood.

For the construction related wastes, a detailed evaluation has been undertaken of the site conditions via a comprehensive site investigation (see Section 14) and cross referenced with the planned engineering works in order to identify the likely provenance and quantity of waste materials that will be generated. Sustainable solutions have then been researched to enable, as much as possible, the re-use of this material and avoidance of landfill disposal.

These issues are discussed in more detail in the following sections.

18.4 Baseline Conditions

The current site activities generate a relatively limited range of waste materials, which are predominantly non hazardous wastes and, to a much lesser extent, hazardous wastes (in the main sanitary wastes). At present the storage and management of these materials is ad-hoc with the various site users having their own waste disposal arrangements. Waste currently identified on site comprises in the main general wastes comprising paper, cardboard and plastic generated as a result of various operations undertaken at the site. There is no formal site-wide waste management plan.

Insofar as waste management is concerned, generally the following arrangements exist:

- General Wastes (paper, card, plastic, waste products, etc) are taken away in bins/small skips by various waste contractors, as appointed by individual tenants, to waste transfer station for segregation/recycling with non recyclables bulked up for landfill disposal;
- Some tenants may segregate cardboard, paper and plastic wastes for recycling; and
- There are no site-wide recycling, segregation or recovery initiatives and no overall waste management philosophy and no on-site treatment of wastes.

If no development takes place, such wastes will continue to be produced and managed in an ad-hoc manner. The quantities involved are very small. The new Phase 1 development when completed will produce similar wastes which will be managed and disposed of under a waste management contract with an appropriately licensed contractor.

18.5 Assessment of Project Impacts

The development will have two distinct phases of waste generation, the first being one-off construction related wastes which will be short lived and transient, the second being the long term waste generation activities associated with the tenants and site users. For the proposed mixed use site, the anticipated waste types that are predicted for both the construction and operational phases are presented in the *Table 18.1*.

Table 18.1: Predicted Waste Types

Construction phase wastes	Operational phase wastes
Building demolition rubble comprising, brick, glass, timber and concrete.	Small quantities of waste oils and chemicals from certain businesses and site support activities.
Uncontaminated excavation waste	Paper, cardboard, food and plastic waste from business activities and residential dwellings
Inert waste	Medical, sanitary and cleaning chemicals wastes from residential and commercial premises.
Asbestos-containing materials <i>e.g.</i> from roofing and lagging materials.	Waste vegetation from routine maintenance of landscaped areas.
Waste Oils and potentially hazardous materials from buildings clearance.	Redundant plant and equipment.
Mixed packaging waste	Soils and possible contamination from minor earthworks (sewer repair, trenching, post boring, etc).

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Construction phase wastes	Operational phase wastes
Wood waste	Sanitary effluent from business and residential premises.
Mixed metals	Construction/demolition wastes from periodic contractor activities.
Gypsum plasterboard waste	
Waste insulation material	
Collected groundwater and rainwater.	

All such wastes derived on the site will be disposed of to appropriately licensed off-site facilities using reputable waste management contractors and for which the necessary Duty of Care documentation will be kept. Consequently, these wastes will have negligible impact on the environment.

These materials will be generated to varying quantities which cannot be specified at this time as it is partly dependent upon the precise nature of the businesses and site occupiers and how effective they are at waste minimisation and waste management. It is possible, however, to give a relative assessment of the potential waste quantities and their intended fate.

Table 18.2: Fate of Generated Wastes

Waste Type	Phase	Relative Volume	Fate
Building demolition rubble comprising, brick, glass, timber, concrete.	Construction	Large	Reuse on site, excess reused off site at an exempt site/standard permit site.
Uncontaminated excavation waste	Construction	Large	Reuse on site, excess reused off site at an exempt site/standard permit site.
Inert waste	Construction	Large	Removed off site by inert waste disposal contractor for onward recycling.
Asbestos-containing materials e.g. from roofing and lagging materials.	Construction	Small	Removed by specialist contractor working to approved method statements. Removed off site for safe disposal.

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Environmental Statement
Beorma Quarter (Phase 2 & 3), Birmingham

Waste Type	Phase	Relative Volume	Fate
Excavated soil (potentially contaminated) associated with foundation and basement excavations and trenching for services.	Construction	Small	Treated on/off site in accordance with methodology set out in chapter 14.
Waste Oils and potentially hazardous materials from buildings clearance.	Construction	Small	Removed off site to licenced treatment & disposal/recycling facilities.
Mixed packaging waste	Construction	Moderate	Segregated on site, compacted and removed off site for recycling by packaging waste disposal contractor.
Wood waste	Construction	Moderate	Segregated for reuse on site. Surplus to be removed from site and sorted for re use by the local Community wood Recycling Scheme.
Mixed metals	Construction	Small	Removed off site for recycling at metal recycling facility.
Gypsum plasterboard waste	Construction	Small	Segregated on site and removed off site for specialist recycling.
Waste insulation material	Construction	Small	Collected and taken for disposal.
Collected groundwater and rainwater.	Construction	Moderate	Discharge to storm water drains if uncontaminated. If contaminated collected for offsite treatment.
Small quantities of waste oils and chemicals from certain businesses and site support activities (e.g. CHP maintenance activities).	Operational	Small	Removed off site to licenced treatment & disposal/recycling facilities.
Paper, cardboard, food and plastic waste from business activities and residential dwellings	Operational	Moderate	Off-site recycling via contracted waste management firms.

Waste Type	Phase	Relative Volume	Fate
Medical, sanitary and cleaning chemicals wastes from residential and commercial premises.	Operational	Small	Segregated and removed from site for specialist treatment/recycling,
Waste vegetation from routine maintenance of landscaped areas.	Operational	Small	Removed for off-site composting.
Redundant plant and equipment.	Operational	Small	Sent for recycling.
Sanitary effluent from business and residential premises.	Operational	Moderate	Discharge via existing foul sewers.
Construction/demolition wastes from periodic contractor activities.	Operational	Small	Where appropriate to the scale of project construction phase protocols to be adopted.
Key : Small = tens of tonnes Moderate = hundreds of tonnes Large = thousands of tonnes Very Large = tens of thousands of tonnes			

18.7 Cumulative Impacts

The wastes generated at the site will contribute to the overall burden of Municipal Solid Waste production. This is not necessarily additive, however, as the businesses, activities and persons that will occupy the developed site would still exist and be based elsewhere producing similar quantities and types of waste. As such, there are no cumulative impacts insofar as wastes are concerned.

18.8 Impact Mitigation and Residual Effects

Beorma Quarter Resource Management Plan

The waste management issues associated with the construction phase will be managed via the main contractor’s Resource Management Plan. The Resource Management Plan will document all waste arisings and set out a plan and objectives for managing all construction wastes in accordance with the accepted best practice waste hierarchy as follows:

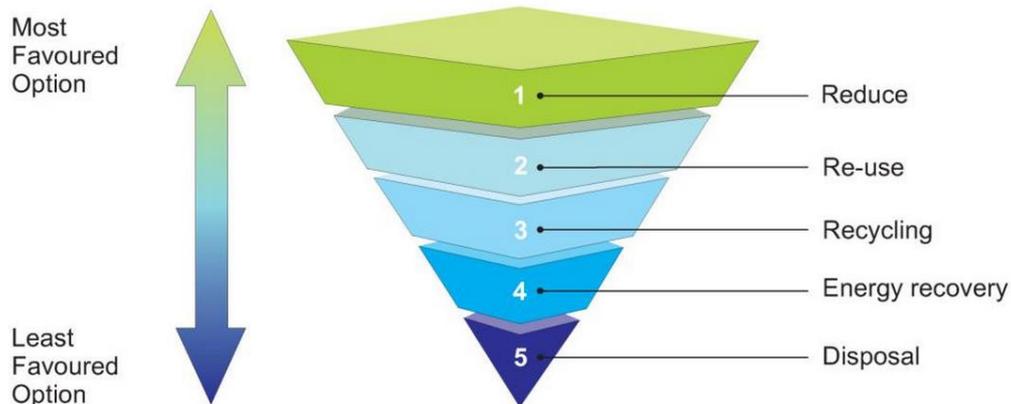


Figure 18.1: Waste Hierarchy of Preferred Management Methods

The Resource Management Plan will be supplemented by site inductions and “toolbox talks” to all stakeholders and contractors to ensure that opportunities are sought and exploited where possible. The Resource Management Plan will set out specific targets for recycling, re-use and recovery of various construction wastes and will document success against these targets.

The demolition rubble and excavated soils associated with the site clearance and construction works will be the dominant and most environmentally significant waste stream associated with this project, but this will be transient in nature. Insofar as a summary of the management of rubble and contaminated soils arising on the site is concerned the following aspects are pertinent:

- Asbestos containing materials will be removed from all buildings prior to demolition and disposed of off-site by a licensed asbestos contractor;
- Tenants will be obliged to remove all redundant equipment and waste materials associated with their activities on vacating the current premises;
- Demolition rubble will be screened and crushed (where suitable) for re-use on the site as bulk fill;
- The asbestos identified during the archaeological trial trenching will be excavated under controlled conditions *i.e.* in calm weather conditions, with damping down of the asbestos materials, if necessary to minimise the risk of air borne asbestos fibres, for off-site disposal by a licensed waste contractor to a suitably licensed waste disposal facility. The excavation will be monitored by qualified and experienced field scientists to ensure the asbestos containing materials are handled and segregated appropriately;

- Materials arising from the bulk excavation to create the basement voids (expected to be in the order of 7,000m³) will be screened and characterised to try and ensure that as much as possible of this material is sent for beneficial re-use off site. For example, for landscaping projects, bulk fill for other development projects or landfill engineering materials;
- Arisings from the piling operations will be treated similarly to other excavated materials, being monitored, analysed and managed; and
- Detailed records (and where appropriate a photolog) will be kept of all construction phase waste arisings and their management and fate. This will be reported to the Local Authority and EA on completion of the construction phase.

The wastes associated with the operational phase will be governed by a site wide Waste Management Policy as described below.

Beorma Quarter Waste Management Policy

It is unlikely that the proposed commercial tenants will be obligated under the *Producer Responsibility (Packaging Waste) Regulations 1999 (as amended)* (which sets out recycling, re-use and recovery obligations), hence there will not be a formal requirement for individual waste generators to recover and/or recycle packaging waste generated as a result of their activities. The residential tenants, however, will have their waste collected as part of the Council's municipal waste collection services and thus will be obliged to comply with The Council's waste collections and recycling requirements. For each residential phase at ground floor level a dedicated area with appropriately sized waste receptacles will be provided for the disposal of waste. Within phase 2 (and as a result of the height of the residential component of this phase) a refuse chute will be provided, accessed at each floor and with a 'selector' facility allowing the segregation of recyclable and non-recyclable waste which will then be deposited into designated bins at ground floor level. The residential management company will be responsible for ensuring the removal of full bins and the substitution of empty bins. Within phase 3 general waste and recyclable bins will be provided in the ground floor refuse store where residential tenants will deposit waste. Within phase 2 signage will inform tenants of the correct use of the refuse chute to segregate recyclable and non-recyclable waste. This will be augmented by guidance within the tenant's pack issued by the management company. Within Phase 3 the refuse store and waste receptacles for residential tenants will be suitably sign posted to ensure tenants are clearly informed of the waste disposal facilities provided. As with phase 2 this will be augmented by guidance within the tenant's pack issued by the management company.

With respect to commercial tenants, the waste strategy is likely to adopt two strands.

Ground floor retail/leisure tenants

It is likely that ground floor retail/leisure tenants will have national waste management arrangements with waste/packaging recycling organizations. Retail/leisure tenants will therefore be responsible for the storage and subsequent off-site disposal of their own waste materials. In order to ensure adequate standards of waste management at the site, however, retail/leisure tenants will be required to subscribe to a site wide Waste Management Policy that will be set out in the tenants handbook. The Waste Management Policy will include the following provisions:

- all wastes must be stored in appropriately labelled waste storage receptacles on suitably hard surfaced areas, away from drains;
- the waste receptacles shall be located in designated waste storage areas;
- waste storage areas must be kept clean and tidy and must be litter free at all times;
- where possible wastes should be segregated to facilitate off-site recycling or reuse;
- the disposal of wastes to landfill should be avoided where possible;
- tenants must retain Duty of Care Waste Transfer Notes and Hazardous Waste Consignment Notes for the appropriate length of time; and
- tenants must provide site management with details of all appointed waste contractors who may have reason to access the site.

Office tenants

It is likely that each office tenant will employ its own cleaning company. However, the building management company will adopt the site wide Waste Management Policy set out above and, through the tenants lease, tenants will be required to comply with this policy. Tenants will be expected to segregate recyclable and general waste for clearance by the cleaning company to ground floor refuse stores. Within each refuse store there will be clearly sign posted waste receptacles for recyclable/general waste. Waste is likely to be collected by a contracted waste/packaging recycling organization, with the frequency of collection matched to the business practices of the tenants and the volume of waste generated.

Wastewater Generation and Management

In addition to solid wastes, the development will also generate wastewaters. As with most aspects of the Development, construction and operational phases need to be considered

separately. During the construction phase, the principal wastewaters will be the sanitary waters for site workers and occupants (which will utilise the current foul-water systems) and 'waste' waters arising from de-watering of excavations, which is not expected to be contaminated. During the operational lifetime of the development, de-watering will not be necessary; however, there will be a requirement for sanitary systems and discharge arrangements for each of the proposed development buildings. In broad terms the anticipated waste waters will comprise:

- Clean surface water run-off;
- Contaminated surface water runoff;
- Groundwater (significant contamination is not anticipated); and
- Sanitary water from toilet facilities and washrooms. These issues are discussed in more detail below.

Construction Phase

Wastewaters likely to be generated on site during the construction phase include the following:

- temporary portable toilet facilities to be utilised by the construction workers;
- temporary discharges associated with changeover from the old drainage system to the new drainage system and its management;
- wastewaters from the dewatering of excavations although quantification of the possible volume involved cannot be undertaken at this stage as this is dependent upon the depth and extent of excavation, the incidence of rainfall and the rate of inflow; and
- dirty water from a temporary on-site wheel-wash, should one be required during the construction works.

Operational Phase

None of the wastewaters identified above will be associated with the operational phase. The main wastewater once the site is operational will be sanitary waste water from the toilet blocks and washrooms associated with the site tenants. It is also possible that there will be minor discharges from small scale floor washing facilities.

If this is the case, it is unlikely that tenants will require a trade effluent discharge consent due to the composition, the infrequent nature and low volume of the discharges. Restaurant

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facilities may, however, require a trade effluent consent for the kitchens and a grease trap on the drains.

Mitigation

Clearly it will not be acceptable to simply discharge wastewaters to unsurfaced areas of the site or direct to surface water drains; on site wastewater management will be required.

During the construction phase, temporary portable toilet units will be provided discharging into the existing foul water sewerage system.

The waters arising from excavations will in all cases be sampled and analyzed to enable their contamination status to be assessed. Based upon the results of this a number of options are available for the management of this water. These include:

- Spraying on to un-surfaced areas of the site to allow evaporation and re-infiltration of the waters (with appropriate EA approval);
- Discharge to foul sewer under a temporary discharge consent with the water utility company; and
- Temporary storage on-site and off-site removal in road tankers to a wastewater treatment facility (if the water is found to be contaminated).

Once the site is operational, sanitary waste will be discharged direct to the municipal foul sewer.

The management and maintenance of the site's foul sewer system will fall under the control of the facilities management team to ensure consistent management and operation of this drainage system for the development.

18.9 Summary

The Beorma Quarter currently generates a limited range of waste materials which are currently stored and disposed of in an ad hoc manner. Whilst some tenants may have individual recycling arrangements, there is no site wide waste management philosophy. The existing development also produces wastewater – sanitary waste that is discharged into the existing public sewers.

Waste

The project will generate waste during two distinct phases, the construction phase and the operational phase. The predicted waste generated by each phase has been assessed, and the fate of each waste type determined. During the construction phase a Resource Management Plan will look to: prevent/reduce waste, reuse material, recycle and recover waste and only then dispose to landfill. During the operation phase a Waste Management Policy will look to segregate recyclable material from general waste.

Wastewater

Also during the construction phase, wastewater from sanitary facilities will be discharged into the existing foul sewerage system. Other waste waters will be tested and either evaporated, discharged into the foul sewerage system or removed from site by road tanker.

During the operation phase the only wastewater predicted is sanitary waste which will be discharged into the existing sewerage system.

The overall environmental impact in terms of waste management will be a minor negative impact for the construction phase as large volumes of waste will be generated that would not arise under the baseline conditions but the operational development represents a moderate positive impact. Although greater waste volumes will be generated, these will be better managed and dealt with in a more sustainable way than occurs presently.

Based upon the appraisal of waste management impacts discussed above, the residual impacts associated with the **Construction Phase** are deemed to be of **LOW** significance and short-term and temporary in nature. The residual impacts associated with the **Operational Phase** are deemed to be of **LOW** significance and long-term or permanent in nature.