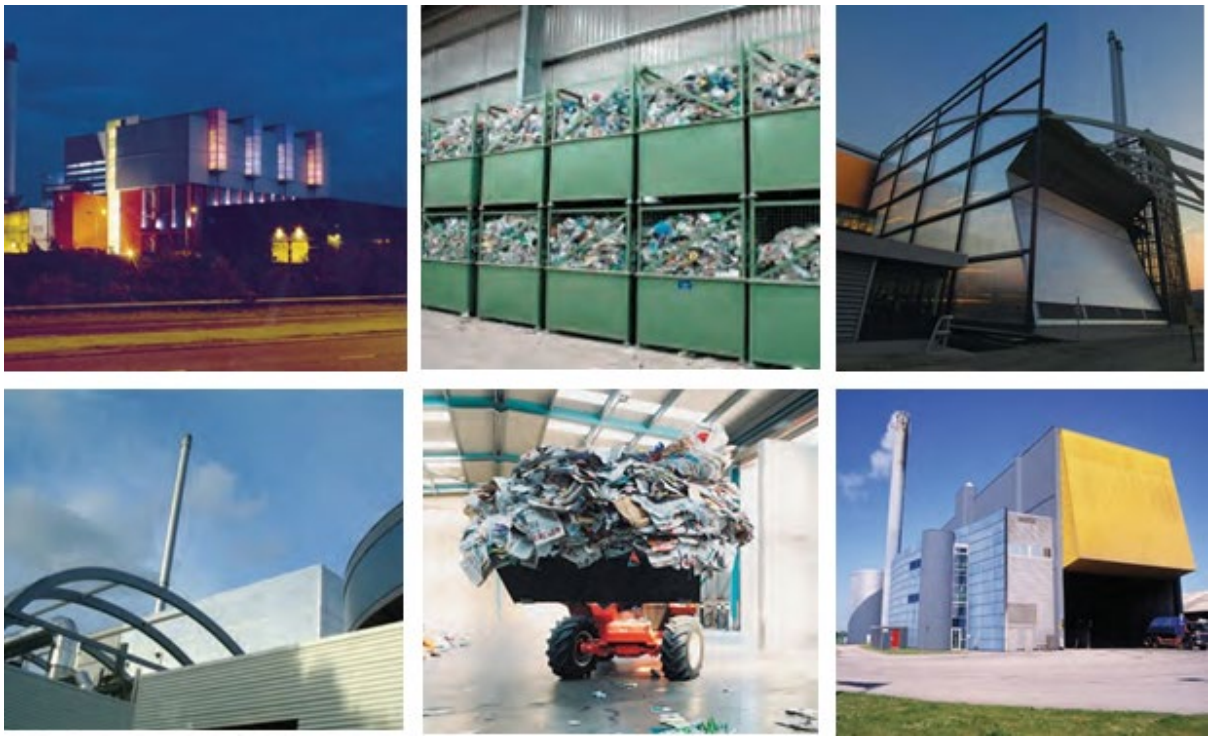
West Sussex High Quality Waste Facilities Supplementary Planning Document



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Contents

1. Introduction

Portsmouth Energy Recovery Facility - an award-winning design. "Waste management facilities themselves should be well designed so that they contribute positively to the character and quality of the area in which they are located." (Planning Policy Statement 10: Planning for Sustainable Waste Management.)

Nature of the Supplementary Planning Document

1.1 There is a growing awareness of the increased need for new and improved facilities to process and dispose of waste. In enabling the delivery of these new facilities, West Sussex County Council (WSCC) is keen to ensure that their design and layout are of a high standard so as to minimise environmental and visual impact as well as any potential conflict with other land uses.

1.2 Indeed, the Government, in its Planning Policy Statement 10: 'Planning for Sustainable Waste Management' (PPS10), recognises the importance of high-quality design, stating:

"Waste management facilities in themselves should be well-designed, so that they contribute positively to the character and quality of the area in which they are located. Poor design is in itself undesirable, undermines community acceptance of waste facilities and should be rejected." (Paragraph 36).

1.3 This Supplementary Planning Document (SPD) has been prepared to guide the design and layout of waste management facilities. It is not a prescriptive or rigid document but rather is intended as a useful tool for all those involved in the development process.

1.4 The main aims of the SPD are:

- to improve the quality and design of waste facilities to ensure that they can be integrated with other land uses with minimum conflict; and
- to minimise the environmental and visual impact of waste facilities through high quality design.

1.5 It is intended that this SPD is used by all groups involved in the design and development of new waste facilities or the modification of existing facilities. In particular, applicants for planning permission and their advisors, such as planning consultants, architects, engineers etc. should interpret the guidance in a site-specific way and be able to justify their proposals through their planning application. The advice in this SPD will also help applicants to ensure that important design considerations are taken into account at an early stage and throughout the development of proposals, thereby assisting applicants to meet the requirements of Design and Access Statements which must accompany most planning applications (see page 6 for further advice on Design and Access Statements). The SPD is also intended to be used by planning officers and elected members in their work in determining planning applications.

Status of the Supplementary Planning Document

1.6 WSCC, as Minerals and Waste Planning Authority, is responsible for preparing statutory land use planning policies and for determining applications for minerals and waste development against those policies. The Minerals and Waste Development Framework (MWDF) contains the plans prepared under the former planning system that will be 'saved' until they are replaced in the Framework by a new Development Plan Document (DPD). The 'saved' plans are the adopted West Sussex Structure Plan 2001-2016 and the adopted West Sussex Minerals Local Plan. Although not a 'saved' plan, the Revised Deposit Draft Waste Local Plan (WLP) has been adopted for development control purposes.

1.7 This SPD will form part of the MWDF which will also include the new Minerals and Waste Core Strategy DPD, the Strategic Waste Site Allocations DPD and the Mineral Site Allocations DPD. The new DPD will eventually replace the 'saved' Minerals Local Plan (MLP) and the draft WLP.

1.8 This SPD supplements Structure Plan Policy DEV1 (High Quality Development) and builds upon the criteria set out in part (a) of the policy:

Policy DEV1 – High Quality Development:

(a) Development should not be permitted unless the construction, layout, scale, appearance, and landscaping are of high quality taking into account the need to:

(1) integrate with and, where possible, enhance adjoining land uses and minimise potential conflicts between land uses and activities;

(2) have regard to the local context including:

(i) the varied traditions and character of the different parts of West Sussex;

(ii) the characteristics of the site in terms of topography, natural and man-made features, and micro-climate;

(iii) the morphology, landscape, townscape, streetscape, and skyline of the surrounding area;

(iv) views into and out of the site; and

(v) the use of materials and building styles;

(3) create a sense of place which is easy to understand through the use of distinctive buildings, open spaces, routes, and landmarks (including works of art);

(4) give high priority to pedestrians, those with impaired mobility, cyclists, and users of passenger transport, reduce the dominance of cars and roads, and integrate with existing transport provision;

(5) create a high quality, socially inclusive, and adaptable environment for occupiers and users which meets their long-term needs;

(6) create a safe and well-cared for environment where opportunities for crime and anti-social behaviour are minimised;

(7) protect and enhance the biodiversity of the site and the surrounding area;

(8) ensure energy efficiency, minimise the use of non-renewable energy, and maximise the use of renewable energy sources;

(9) minimise impact on and the use of natural resources (air, soil, water, and minerals), minimise waste generation, and maximise the use of recycled materials; and

(10) meet the needs of service providers and ensure the integrated provision of infrastructure and utilities.

1.9 Relevant WLP policies have been given due regard in drafting this document.

1.10 A Sustainability Appraisal Report has also been prepared in tandem with this SPD. The Sustainability Appraisal is a systematic and iterative process that defines and reports on the likely significant effects of the SPD and the extent to which the SPD will contribute to sustainable development. A Sustainability Appraisal of the SPD is compulsory under the requirements of the Planning and Compulsory Purchase Act 2004 and Planning Policy Statement 12: 'Local Development Frameworks' (PPS12). The purpose of the Sustainability Appraisal is to promote sustainable development by integrating sustainability considerations into the preparation and adoption of the SPD.

Community and Stakeholder Involvement

1.11 Planning Policy Statement 1: 'Delivering Sustainable Development' (PPS1), states that:

"Community Involvement is vitally important to planning and the achievement of sustainable development."

1.12 The Council's Statement of Community Involvement (SCI) outlines its policy for involving interested parties when consulting on planning applications and in the preparation of documents to be included in the MWDF.

1.13 The adopted SCI is being reviewed and has gone through two revisions following public consultation exercises (the Issues and Options and Preferred Option stages). It has been amended following representations made at the Preferred Option stage and the process will continue through to final adoption.

1.14 In line with the recommendations of the SCI, stakeholder consultation has been undertaken to help inform the contents of this SPD.

Public Consultation

1.15 During the preparation of this SPD, the County Council was keen to establish the views of the community and key stakeholders. Comments on this SPD and the accompanying Sustainability Appraisal Report were therefore invited over a six-week period between 29 September and 10 November 2006.

1.16 A summary of each consultation response, along with the Council's response and amendment to the SPD/Sustainability Appraisal has been produced in a separate document entitled 'Statement of Representations'. The representations have helped to shape this final version of the SPD which was adopted by WSCC on 22 December 2006.

Public consultation events.

2. Legislative Framework and Relevant Guidance

Chichester Household Waste Recycling Site.

National Planning Legislation

Planning and Compulsory Purchase Act 2004

2.1 The Planning and Compulsory Purchase Act 2004 requires local planning authorities to produce a Local Development Framework. Minerals and Waste Planning Authorities are required to prepare a Minerals and Waste Development Framework (MWDF) comprising Development Plan Documents (DPD), which hold Development Plan status, and Supplementary Planning Documents (SPD). Both types of documents can be used to determine planning applications. The MWDF will replace the Revised Deposit Waste Local Plan and will set out how the County

Council's spatial strategy for the future provision of waste facilities and the management of the county's waste.

2.2 The legislation is designed to pave the way for a more flexible and responsive planning system for England and Wales by introducing what the government believes is a simpler and more flexible plan-making system at regional and local level.

2.3 A particular type of LDD is the Statement of Community Involvement (SCI) which must set out the authorities' policy for involving the community in the preparation and revision of LDDs and planning applications. The SCI is legally binding upon the authority to the extent that they are obliged to comply with it when preparing LDDs. The aim of SCIs is to strengthen community involvement by involving stakeholders at an early stage and draw on local communities' knowledge and experience to improve the quality of the planning process.

Design and Access Statement

2.4 Circular 01/06: 'Guidance on Changes to the Development Control System' has introduced a requirement to submit a Design and Access Statement with the majority of planning applications. Most applications for waste facilities will need to include a Design and Access Statement. This SPD is intended to provide valuable guidance on a range of generic and facility specific design considerations which applicants for planning permission and their advisors can draw upon in producing Design and Access Statements.

2.5 These statements have two parts. The 'design' part should explain and illustrate the design thinking behind a proposal, elaborating on the six issues of use, amount, layout, scale, landscaping, and appearance (see Design and Access Statements – how to write, read, and use them; Commission for Architecture and the Built Environment (CABE) 2006, including how the local context has influenced the design; justify what is being applied for; and how it meets relevant legislation and policy, such as Structure Plan policy DEV1 and the MWDF. The second part looks at 'access', covering not only transport links, vehicular and emergency access, but also inclusive access ensuring that all members of society are included and adequate provision made (such as for those with disabilities). Applicants are encouraged to use the detailed guidance produced by CABE on the meaning of these design and access criteria which should be covered in the statement.

2.6 Statements accompanying outline applications should explain and justify the decisions taken so far but, importantly, must also set out the aims for the whole design, explaining the principles that will be followed after outline permission is granted. In addition, any community involvement undertaken or planned regarding the proposal(s) should be outlined in the statement, as well as any technical advice from for example design or highway specialists.

The Town and Country Planning [Environmental Impact Assessment (England and Wales)] Regulations 1999

2.7 The need to undertake an EIA is governed by the Town and Country Planning [Environmental Impact Assessment (England and Wales)] Regulations 1999. An EIA is an important tool to assess and understand the likely effects of new waste facilities on the immediate and surrounding environment before development is allowed to go ahead.

2.8 Undertaking an EIA can identify whether the characteristics of a proposed facility, its location, and potential impacts of its activities are significant enough to refuse planning permission, or whether environmental impacts can be mitigated through its design and management. Therefore, an EIA can help to achieve the main aims of this draft SPD, the MWDF and Structure Plan Policy DEV1 – High Quality Development.

2.9 Under these regulations, Local Planning Authorities (LPA) should consider on a case-by-case basis whether proposals require an EIA using Schedules 1 and 2 of the Regulations (shown below). A screening opinion should be produced for this purpose on both outline and reserved matters applications, as well as full planning applications.

2.10 Applicants are encouraged to request a screening opinion before a formal application is submitted. If an EIA is required, applicants should discuss with LPAs the scope of an environmental statement and, to clarify which issues need to be addressed, a scoping opinion should be produced by the LPA when necessary.

2.11 Schedule 1 of the 1999 Regulations lists development for which an EIA is required in every case. Certain types of major waste management installations are included in the schedule under items 9 and 10 of Directive 75/442/EEC.

2.12 Schedule 2 of the 1999 Regulations lists development for which an EIA is required only if the proposal is judged likely to give rise to significant environmental effects. Installations for the disposal of waste (other than those covered by Schedule 1) are listed under Paragraph 11, part b), Other Projects. The applicable thresholds and criteria for the purpose of classifying development as Schedule 2 include:

- the disposal is by incineration; or
- the area of the development exceeds 0.5ha; or
- the installation is to be sited within 100m of any controlled waters.

2.13 Further guidance on EIA can be sought from Environmental Impact Assessment: Guide to Procedures and Circular 2/99: 'Environmental Impact Assessment'.

National Waste Legislation

Landfill Regulations

2.14 Following the implementation of the European Union (EU) Landfill Directive, the UK transposed the Directive into UK legislation under The Landfill (England and Wales) Regulations 2002 (the Landfill Regulations). The Environment Agency, as the waste regulator is responsible for enforcing the requirements of the Landfill Regulations.

2.15 There are two aspects of the Landfill Regulations that need to be addressed. Firstly the Regulations set the criteria for locating landfill sites in terms of engineering requirements, waste acceptance procedures, landfill classifications and pre-treatment of waste prior to disposal. The Environment Agency's guidance RGN3 provides specific guidance on this issue in the context of groundwater protection.

2.16 The second aspect is the targets that have been set to divert waste from landfill disposal. In applying these targets, Member States of the EU have a duty to increase the rate of recycling and recovery to ensure waste disposal is the final option. Statutory targets have been applied through the Government Policy to Local Authorities which can be fined for failing to reach their target. This has resulted in a need for more facilities to recover and recycle waste.

2.17 The mechanism for implementing the Landfill Regulations has been for operators to apply for a Pollution Prevention and Control permit (PPC permit), under the Pollution Prevention and Control (England and Wales) Regulations 2000 (the PPC Regulations).

Pollution Prevention and Control Regulations

2.18 The Pollution Prevention and Control Regulations provide a list of activities for which a PPC permit is required to operate. With regards to waste operations, the listed activities which require a PPC permit include:

- disposal of waste by incineration;
- disposal of waste by landfill;
- disposal of waste other than by incineration or landfill;
- hazardous waste disposal;
- waste oils disposal;
- biological treatment >50 tonnes per day;
- physico-chemical treatment >50 tonnes per day.

2.19 The PPC Regulations therefore apply to thermal treatments, landfill disposal, and transfer/treatment facilities that meet the stated thresholds.

Waste Management Licensing Regulations

2.20 The Waste Management Licensing Regulations 1994 require waste management sites to operate in accordance with a Waste Management Licence. Some operations are exempt from licensing.

2.21 There have been many legislative changes since 1994, particularly with the introduction of the Landfill Regulations and PPC Regulations. Some activities such as landfill disposal, thermal treatment and other transfer/treatment operations have been transferred from the licensing regime to the PPC regime where throughputs are below PPC thresholds. Waste Management Licences are required for other waste management operations including waste transfer stations, Material Recycling Facilities (MRF), compost sites and Household Waste Recycling Sites (HWRS).

Regional Waste Guidance

Regional Planning Guidance 9: South East

2.22 New regional policies on waste management have been adopted (June 2006) and are now part of RPG9. Policies W1-W17 include targets for waste reduction and recycling, as well as guidance on the location of waste management facilities.

The South East Plan

2.23 Policies W1-W17 from RPG9 – Waste and Minerals (2006) document have been reproduced into the draft South East Plan (March 2006), with amendments to policies W3, W10, W15, and W17.

2.24 Other documents have been considered in the compilation of this SPD, and a full list of all documents is included at 'Appendix A: Relevant Guidance Documents'.

Other Relevant National Planning Guidance

- PPS1 (2005) – Delivering Sustainable Development
- PPS7 (2004) – Sustainable Development in Rural Areas
- PPS10 (2005) – Planning for Sustainable Waste Management
- PPS10 (2006) – Companion Guide
- PPS12 (2004) – Local Development Frameworks
- PPG13 (2001) – Transport
- PPS23 (2004) – Planning and Pollution Control
- PPG24 (1994) – Planning and Noise
- Circular 2/99: Environmental Impact Assessment

3. Character of West Sussex

Energy from Waste Facility, Måbjergværket, Denmark – a good example of how a well-considered landscape scheme can enhance the appearance of a waste facility, particularly in an urban environment where space is at a premium.

3.1 The West Sussex MWDF Sustainability Scoping Report (May 2006) provides the following overview of the County:

"West Sussex covers an area of 2,030km and includes Adur, Arun, Chichester, Horsham, and Mid Sussex Districts, and Crawley and Worthing Boroughs. Just over 750,000 people live in West Sussex, nearly 90% of which live in 24 towns and villages of over 4,000 population which cover just over 12% of the land area. There is a strongly defined settlement pattern of medium-sized and larger towns, villages, and coastal settlements. Most development is on the coast and the eastern fringes leaving the centre almost wholly rural. Over half the County is in three nationally-designated Areas of Outstanding Natural Beauty (AONB), and

woodlands and forests account for about 13% of the land area. Most of the farmland is arable or improved grassland and the best of agricultural land is on the coastal plain.

The main transport corridors are the South Coast rail and A27/A259 road corridor and the Crawley/Brighton rail and A23 road corridor. Secondary corridors are the Arun Valley rail corridor and the A24 road corridor, which link the north east of the County with the coast."

Character

3.2 West Sussex, stretching from Gatwick Airport and the large urban areas of Crawley and Horsham in the north to the smaller coastal towns of Selsey and the Witterings in the south, has a diverse and varied character with a rich tapestry of landscapes, settlements and transportation corridors. Protecting the distinctive character of the towns and villages, countryside, and coast of West Sussex is one of the three key aims set out in the adopted West Sussex Structure Plan.

The rolling downland character of West Sussex.

3.3 The character of West Sussex has evolved and continues to evolve over time and is defined by the underlying geology and successive weathering climates that have determined the form of the land and the vegetation which covers it, and by human activity and the exploitation of resources.

3.4 The County has five main natural character areas which are referred to in the Structure Plan: the South Coast Plain; the South Downs; the Wealden Fringe (Greensand); the Low Weald; and the High Weald. These areas include a variety of features such as woodlands, forests, rivers, walkways, wetlands, and the coast, and are protected by Policies CH1-CH7 of the Plan.

3.5 West Sussex has an exceptional character, more than half of the County is designated as AONB, with significant parts of the coast remaining undeveloped. A large part of West Sussex is also proposed within the South Downs National Park, which if confirmed will stretch from Winchester to Eastbourne.

3.6 There is also a rich and diverse urban legacy with a settlement pattern of mainly small to medium-sized towns and villages, the rest of the County being largely rural and tranquil. It is important to protect towns and villages and their settings, each having their own diverse character, defined by the settlement form, buildings, and open spaces. Scheduled monuments, listed buildings, conservation areas, etc, all need to be taken into account.

3.7 Chichester and Arundel are two historic towns of national importance. Billingshurst, Midhurst, and Petworth are traditional market towns whilst Worthing, Bognor, and Littlehampton are classic seaside resorts. The settlements of Horsham and Haywards Heath traditionally expanded during the heyday of the railways, with the settlements to the north influenced by the presence of Gatwick Airport.

3.8 It is important to appreciate the character of different parts of the County. This ranges from the predominantly flat South Coast Plain, the grand sweep of the South Downs, the intricate escarpments and valleys of the Wealden Fringe, to the intimate landscapes of the Low Weald and the wooded hills and valleys of the High Weald. Each has a unique configuration of geology and soils, biodiversity, appearance, settlement pattern, locally distinctive architecture, patterns of land use and economy, visible and perceived history, and a degree of tranquillity to distinguish one area from another.

3.9 Any proposals for future waste development should take account of the character of the County and accord with the policies set out in the Development Plan. Landscape Character Assessment is a technique that has been developed to facilitate a systematic analysis of the landscape quality and character of an area. The County Council and its partners are working on a five-year series of projects, known as the Character of West Sussex Partnership Programme, which aims to promote higher quality development, land management and conservation practices which respect the character of the County and its environmental assets. This will assist developers and interest groups assess the impacts of any waste development proposals and be taken into account in the design and development of such facilities.

Environment

3.10 The high quality of the environment is one of the West Sussex's greatest assets. It is widely recognised that, in meeting development requirements, the quality of the environment is not compromised and that opportunities are taken to make improvements, with proposals seeking to preserve and enhance natural resources – including air, soil and water. The Structure Plan seeks to preserve and enhance the quality of the environment in policies ERA1-8.

3.11 Significant areas of West Sussex have been formally recognised for their nature conservation importance. International designations include five Special Protection Areas (SPA), five Special Areas for Conservation (SAC), and three Ramsar sites, the majority of which are located within Chichester and Pagham Harbours and the Arun Valley.

3.12 In addition to international designations, the County has a network of nature conservation designations, including 82 Sites of Special Scientific Interest (SSSI) and two National Nature Reserves (NNR) at Kingley Vale and Ebernoe Common. There are also a range of more local designations, including 266 Sites of Nature Conservation Importance (SNCI) and 23 Local Nature Reserves, and a number of Regionally Important Geological/Geomorphological Sites (RIGS) which are the most important sites for geology and geomorphology outside of SSSIs. There may be

other sites or areas of equal importance that have either not been identified or designated.

3.13 Surface water and freshwater marsh are important habitats in the County. There are two reservoirs at Ardingly and Weir Wood and former gravel workings around Chichester, as well as a few areas of inland water. However, West Sussex has a wealth of small downland dewponds, village ponds, and other pools in woodland and on farmland. Along with rivers and streams, these habitats are at increasing risk, mainly from agriculture and drainage works, but also from development. Groundwater and aquifers may also be vulnerable.

3.14 The coast is a local as well as national resource and is important for nature conservation but is an area under threat from coastal processes and to some extent from development. The coastline is naturally sinking and therefore vulnerable to the impacts of climate change and tidal flooding from rising sea levels.

3.15 All proposals for waste development should take account of the existing environment of West Sussex and the policies set out in the Development Plan in order minimise environmental impacts. Where appropriate, development should seek to enhance the biodiversity of the County by enhancing existing habitats, as well as providing new ones. Every effort should be made to minimise impacts on sites with statutory designations and protect the wider environment in terms of air, water, and soil and this should be reflected in the design of proposals.

4. Facility Design Considerations

Open Windrow Compost Turner.

4.1 The range of waste management facilities is changing in response to the requirements to achieve higher recycling rates and divert waste from landfill disposal. New waste management technologies can be broadly divided into biological treatment, mechanical treatment, and thermal treatment, with landfill as a final disposal option. Whilst landfill sites are not specifically covered in this document, some of the generic criteria set out in this draft SPD may still apply. Other facilities for managing waste include transfer stations and Civic Amenity (or Household Waste Recycling) sites.

4.2 This section provides an overview of the main types of waste management facilities together with typical operational details such as throughputs, land occupancy, and waste streams. It also identifies key design considerations for the different types of facility.

Main Types of Waste Management Facilities

Materials Recycling Facilities (MRF)

4.3 The 'R' in MRF is variously reported as standing for Recycling, Recovery or Reclamation. Whichever term is applied, MRFs are generally facilities for the reception and separation of mixed dry recyclables (typically paper, card, cans, and plastic bottles) collected from household and sometimes commercial properties.

Recycling bins provided in Chichester District.

4.4 The operation of a typical MRF involves a combination of mechanical and manual sorting. Mechanical sorting involves a combination of conveyors and magnetic, density and air separators. Manual separation involves simple hand sorting from a conveyor. Whilst very high recycling rates can be achieved, some residual material may require final disposal.

Sorted material awaiting recycling.

4.5 MRFs are usually housed within an industrial-type building with an incoming waste reception area. Machinery is fixed and provision is made for storing sorted material. Typical throughputs range from about 50,000tpa to over 100,000tpa. Based on this, a site area of at least 1-2ha is required. Buildings with a floorspace of at least of 2,500m and headroom of 12m are typically necessary.

4.6 MRFs do not generally deal with putrescible waste and therefore do not have the same potential to create problems caused by, for example, odour and pests. The narrow range of pre-sorted waste dealt with by MRFs may therefore allow establishment in locations where other facilities could be precluded.

4.7 Deliveries of recyclable materials will typically be by Refuse Collection Vehicles (RCV) tied to collection rounds and this can create traffic peaks at

two or three times during the day. Unless co-located with a treatment plant, all the material delivered to a MRF must be removed from it in one form or another. Removal of recyclables to market and residuals to disposal is by large Heavy Goods Vehicles (HGV). Traffic is therefore an important issue to be considered in the design of the facility.

4.8 Other important design issues to consider will be the building form, and noise and landscape impacts. Design for energy efficiency and sustainability must be included.

4.9 The rise in collection of mixed dry recyclables has created a demand for MRF capacity that is currently exceeded by supply. In considering the capacity of a new facility (and therefore the size of site and building required), careful analysis of the volume and source of input must be undertaken.

4.10 New MRF facilities often form part of strategic plans for waste management and can make a significant contribution towards sustainable development.

4.11 The provision of education and visitor facilities should also be considered at the design stage and must take account of guidance and regulations on access and facilities for the disabled.

4.12 In summary, key considerations are:

- traffic impacts and control; and
- size and form of building.

Composting

4.13 Composting is the traditional term to describe the degradation of organic matter. Methods range from open windrows to in-vessel systems. The latter has been further developed to ensure compliance with the Animal By-Products Order (ABPO) for the composting of food waste.

Left: Covered composting pods. Right: Compost being turned

Open Windrow Composting

4.14 Open windrow composting involves the placement of shredded organic waste, typically garden/green waste, into elongated piles (windrows). The windrows can vary in length but tend to be limited in width and height to enable periodic turning. The composting process for green waste takes 8-10 weeks to reach maturation. The windrows are usually uncovered and have generally been sited on farms or at landfill sites.

4.15 The nature of open windrows requires a large surface area. Current best practice specifies an impermeable surface with sealed drainage. Based on an average throughput of 25,000tpa, an area of 2ha will be required.

4.16 Common constraints with respect to open windrow composting are odour, particulate matter and flies, and the release of bio-aerosols. Current guidance recommends that such facilities are located at least 250m from sensitive uses, such as dwellings, schools, public open spaces, or ecological designations, unless an independent risk assessment indicates that there would be no risk to human health.

4.17 The operation of mechanical plant for shredding waste, forming and turning windrows, and screening composted products will generate noise and dust or other particulate or gaseous emissions. Odour can be a particular problem when composting operations are not rigorously managed, or when waste delivered to the site has already started to decompose. Measures to control vermin and pests also need to be robust and effective. The process can also generate leachate which must be managed appropriately. This may include re-circulation to maintain the correct moisture content for the composting process.

4.18 Open windrow composting is sometimes likened to an agricultural operation and location in the countryside may be appropriate. The potential impacts of noise, dust and odour usually preclude locations in proximity to other developments. The prevailing wind direction should be considered.

4.19 Deliveries of waste will typically be in bulk by HGV. The composting process results in a large decrease in volume and therefore removal of products will give rise to fewer vehicle movements. However, products from the composting process may be used locally in bulk on farmland or in the restoration of landfill sites. Traffic constraints are usually associated with poor access for HGVs over the rural network.

In-Vessel Composting

4.20 In-vessel systems are generally enclosed batch processes with forced aeration and extraction of bioaerosols. This more sophisticated approach gained impetus as a result of the introduction of more stringent controls under the ABPO on the handling and treatment of waste foods following the foot and mouth crisis. It allows for the treatment of kitchen and catering wastes that may be collected by Waste Collection Authorities, as well as waste products from food manufacturing. The system ensures that the waste achieves a temperature of 60°C for two days to achieve stability and sanitisation.

In-vessel composting, West London.

4.21 The system will normally include a reception area for incoming waste which is shredded and blended prior to transfer to the enclosed vessels. Vessels include steel containers, concrete silos, tunnels, or fully enclosed halls.

4.22 In order to comply with the ABPO, the composting of kitchen waste needs to be undertaken in two stages. The first stage (barrier 1) includes the placement of material in the vessel system for about 8-10 days. In this time a temperature of 60°C must be maintained for two days. After this time, the process needs to be repeated (barrier 2) and the conditions achieved again. There must be no contamination between the two stages. Final product maturation often entails a third stage of open windrowing which may last for some weeks.

4.23 In-vessel systems typically handle upwards of 25,000tpa. The handling capacities can be increased by increasing the number of vessels.

4.24 The nature of in-vessel composting will require an enclosed reception area. The in-vessel units can vary in size, but will generally require a floor area of 1,000m^2 to 4,000m^2, depending on the type of system.

4.25 In common with windrow systems, in-vessel composting requires a relatively large area (typically greater than 1ha) for the quantity of waste treated, with extensive areas of hardstanding. There is a requirement for more built infrastructure, although, as with open windrow systems, there is some similarity with agricultural operations.

4.26 As with open windrows, rigorous management is required to control odours and leachate. Although the waste is largely contained for most of the time, in-vessel systems attract putrescible material, sometimes in an advanced state of decomposition. Systems which involve total enclosure for all waste handling operations can achieve insignificant levels of offensive emissions. Where waste must be moved in the open from silo to silo, odour control is more difficult.

4.27 Key considerations for both open windrow and in-vessel composting are:

- control of emissions including dust, leachate, and bio-aerosols;
- proximity to sensitive receptors (noise and odour);
- constraints on development in the countryside and landscape impacts; and
- traffic on the road network.

Anaerobic Digestion

4.28 Anaerobic digestion involves the biodegradation of organic material in the absence of oxygen. Undertaken in an enclosed container, microbial activity breaks down the waste, releasing the following:

- Biogas – rich in methane and can be used for heat or electricity generation;
- Digestate – nutrient rich and can be used as a soil conditioner; and
- Liquor – can also be used as a liquid fertiliser.

4.29 Anaerobic digestion can be used to treat household waste. Pre-treatment removes plastics, glass, grit, and metals. Water is added and the remaining waste is then transferred into a sealed container within which bacteria break down the waste producing biogas and residual digestate and liquor. Some residual material may require maturation before final use or disposal. Where a maturation area is required, the design considerations given for composting facilities will need to be considered.

4.30 A typical anaerobic digestion system used for a centralised operation may have a capacity of 40,000tpa. For this throughput the operation would require an area of about 1ha for the plant, control building and storage tanks.

4.31 Anaerobic digestion facilities are typically fully enclosed in an industrial-type building allowing tight control of emissions. External infrastructure includes liquor and biogas storage tanks. Electricity generating plant may be an integral part of the facility. Suitable locations will include land zoned for industrial use.

4.32 Deliveries and removal of digestate will be by HGV. The process involves a large volume reduction in outputs, so outward vehicle journeys will be reduced.

4.33 As with other waste treatment systems, educational and visitor facilities should be considered.

4.34 Key design considerations will be:

- size and form of building and boundary treatments and landscaping (all in the local context);
- control of emissions including odour;
- disposal of liquor; and
- traffic.

Gasification and Pyrolysis

4.35 Gasification and pyrolysis are thermal treatment processes involving chemical reactions at high temperature. Pyrolysis is usually undertaken in the complete absence of oxygen or sometimes limited oxygen. Gasification takes place in the air, enriched with oxygen. The process produces gas (syngas), which can be used as a fuel, and char.

4.36 There are many different types of gasification and pyrolysis facilities, which are generally categorised into closed and open systems. Open systems are generally larger and require a building of about 700m and are usually housed within purpose-built steel structures. Such systems require a stack, with the height varying depending on air dispersion modelling, but generally between 10m and 15m. The main constraints for these facilities are traffic, noise, dust, and odour. The specific constraints will be the visual impact of the stack and the air emissions from the thermal combustion process.

4.37 Closed systems are completely contained and do not need to be housed in purpose-built structures. Their main requirement is that, as it is a thermal process, the building should not be easily flammable. Typically,

these are extremely modern smaller facilities which do not require a stack as there are no airborne emissions from the process. The key design considerations for these facilities are generally traffic and noise.

Autoclave

4.38 The autoclave process involves the treatment of waste with high temperature steam. This produces a range of 'clean' materials which can be sorted into different products for further recycling including metals, glass, and plastics. Residual material has the potential to be used for refuse-derived fuel or in land treatment. Some may require landfill disposal.

4.39 The facilities broadly share the design considerations associated with gasification and pyrolysis plants.

Illustrative 3D model of an Autoclave Plant.

Inert Waste Processing

4.40 Inert waste processing is the treatment of construction and demolition waste to produce secondary aggregates or soils for reuse. Such operations may require extensive areas of land for stockpiling waste for treatment as well as final products. Enclosure of at least the treatment part of operations may be required to reduce impacts to an acceptable level close to sensitive uses.

4.41 Waste is typically delivered to a reception area and mechanically and/or manually sorted to remove items such as metal, wood, or large sections of concrete. The waste may then be screened with fine and coarser material sorted into designated bays or stockpiles. Oversize material and concrete are crushed.

4.42 Inert waste recycling facilities can vary greatly in size, and throughputs can range from 25,000tpa or less to large scale facilities handling 250,000tpa or more. Typically, facilities have been developed on landfill sites or quarries. Industrial locations may be suitable if it can be demonstrated that environmental impacts can be reduced to acceptable levels.

4.43 Inert waste processing involves heavy plant which generates noise and has the potential to create large volumes of dust. Waste delivery and the collection of products generate HGV movements. Open operations are seldom viable near sensitive receptors. Full enclosure and tight control

can reduce possible impacts, but the number of suitable industrial locations is likely to be limited.

4.44 Key design considerations are likely to include:

- traffic impacts;
- control of emissions and proximity to sensitive receptors;
- landscaping and screening to reduce noise and visual impacts;
- heights of stockpiles; and
- design and form of buildings where required.

Used building materials being mechanically sorted.

Household Waste Recycling Sites

4.45 Household Waste Recycling Sites (HWRS) or Civic Amenity Sites have been developed by Waste Disposal Authorities to provide a centralised collection facility for householders. The purpose of such facilities is to provide waste disposal for householders predominantly for recycling and recovery purposes, e.g. garden waste, rubble/hardcore, glass, textiles, metal, batteries, and bulky items such as furniture. There is also an element of general waste, which can include mixed waste and 'black bag' waste.

4.46 HWRSs accept a wide range of waste from householders, including but not limited to:

- hardcore/rubble;
- garden waste;
- waste electrical and electronic equipment;
- gas canisters;
- glass;
- cans;
- metals;
- wood;
- textiles;
- paper and cardboard;
- plastics;
- general waste.

Some of the household waste accepted by HWRSs.

4.47 A typical HWRS is accessible to members of the public. The public are responsible for transferring waste from their vehicles to the correct container, albeit under the supervision of site personnel. When the containers are full, they will be sheeted prior to being removed from the site and replaced with an empty container. This procedure has been adopted for many years by most operators and continues to form the basic principle for HWRSs.

A household waste recycling site with open but clearly marked bins.

Containers specifically designed for plaster and asbestos.

4.48 Historically, HWRSs have often been developed as small-scale operations in locations that may have become unsuitable. As the use of such facilities has increased, the demands on small scale sites have been significant, particularly with respect to traffic congestion during busy periods of weekends, evenings, and public holidays. This has led to a growing need to provide new facilities in appropriate locations in order to manage traffic effectively and maximise the space to increase recycling opportunities. Co-location with other waste management facilities may be appropriate for new facilities, for example the Chichester Waste Transfer Station/HWRS.

4.49 The development of new facilities has moved towards a split-level system to separate the general public areas from the service vehicles collecting the full containers. These arrangements provide easier access to the waste containers and help with the continuous movement of waste by allowing separate access for waste collection vehicles.

4.50 General waste containers at HWRSs may contain household waste, including food waste and nappies, with the potential to attract vermin and flies and give rise to odours.

4.51 The handling capacity of a HWRS will depend on the design and size of the site. Generally, sites tend to be between 0.5-1.0ha and can handle between 10,000tpa and 50,000tpa.

4.52 A key planning constraint with respect to HWRSs will be traffic and access. There tends to be peak periods of use at weekends and public holidays. On this basis careful transport planning is required to minimise queuing.

4.53 Other environmental considerations include; litter, noise, dust, and vermin. Due to the requirement to locate such facilities close to the source; mitigation measures must be incorporated to minimise any nuisance caused.

The design of the Chichester HWRS helps minimise problems with litter, odour, and vermin.

4.54 Key design considerations are likely to include:

- traffic management and access;
- litter, noise and dust emissions and other amenity issues; and
- hours of operation.

Waste Transfer Stations

4.55 Waste transfer stations provide centralised collection points for bulking waste prior to onward transport to a disposal facility. Transfer stations are usually within an industrial-type building and new transfer stations are unlikely to be open-air.

4.56 Transfer stations vary in size from small operations to those handling in excess of 150,000tpa or more. The building size varies accordingly, but may be 2,000m more with a clearance height of 12m. Overall site areas are seldom less than 1/2ha. Designs vary from simple storage bays with waste loaded off the floor, to split level designs with waste compacted mechanically into special containers, sometimes for onward transport by rail or water

Heavy plant and large throughput mean sufficient space and height is necessary within enclosed waste transfer stations.

Entrance to Chichester Waste Transfer Station.

4.57 As with inert waste processing facilities, transfer stations involve the use of heavy plant, significant numbers of HGV movements, noise, and the potential for dust generation. Odour can be significant issue, depending upon the type of waste being handled.

4.58 The shape and form of the building should be an important consideration. Most facilities are enclosed in standard portal-frame steel buildings located on industrial land or at former landfill sites. This may be acceptable in certain situations, for instance where the facility is fully screened, or is

matched to neighbouring industrial buildings. Where transfer stations are proposed in more sensitive locations, or co-located with other new waste facilities, form and colour will be more important.

4.59 Transfer stations dealing with household waste may operate on public holidays and at weekends.

4.60 Key design factors will include:

- traffic and highways considerations;
- emissions of noise and dust;
- potential for extended hours of working; and
- design of building.

Mechanical and Biological Treatment

4.61 Mechanical and Biological Treatment (MBT) is a combination of technologies for the treatment of waste to reduce its volume, weight and biodegradable content and recover recyclable material. Systems can be broadly divided into two types as follows.

4.62 Mechanical then biological treatment involves the mechanical removal of metals, glass, and plastics for recycling as well as contaminants, such as batteries as part of an initial dry process. This leaves a mainly organic fraction for biological treatment which is typically some form of in-vessel composting or anaerobic digestion. The aim of the biological stage is to reduce and stabilise any biologically active materials. The final residue may be landfilled or subjected to further processing, sometimes into refuse derived fuel.

4.63 Biological then mechanical treatment generally involves initial shredding and composting of the waste to reduce organic content and produce a stabilised material. This is then sorted mechanically to remove materials such as metals, glass, plastics, and grit. Some of the sorted material is recyclable and the remainder may be used as refuse derived fuel or landfill.

4.64 For some technologies there may be a stack associated with the air clean up system for mixed waste processing operations.

4.65 Key design considerations are likely to include:

- traffic impacts;
- control of emissions and proximity to sensitive receptors; design and form of buildings;
- stack height where relevant; and
- landscaping and screening to reduce noise and visual impacts.

Incineration with Energy from Waste

4.66 Incineration with Energy from Waste (EfW) plants involve thermal treatment designed to burn waste and produce energy. Waste is delivered to a reception area and then loaded into a furnace feed hopper. The residue from EfW plants consists of bottom ash (the unburned

residue), metals that can be recycled and Air Pollution Control (APC) residues.

An innovative design to an Energy from Waste facility in an urban setting (Chineham, Hampshire).

4.67 The hot gases from the combustion process are directed into a boiler where heat is recovered for electricity generation. Surplus heat may also be used for district heating.

4.68 EfW plants typically occupy an area of 2-5ha. Throughputs can range from less than 50,000tpa to more than 500,000tpa. The EfW plant will comprise a building to house the main thermal treatment components. The stack height will be determined by air dispersion modelling, but generally range from 30-70m. The design of the plant needs to be consistent with the local setting, as the stack height may impact on the local landscape character. New EfW plants offer the opportunity for innovative design and there are many such examples in the UK and the rest of Europe.

4.69 Bottom ash from EfW plants may be suitable for use as secondary aggregates and in other uses in construction. APC residues and fly ash typically require disposal at hazardous landfill sites or treatment facilities

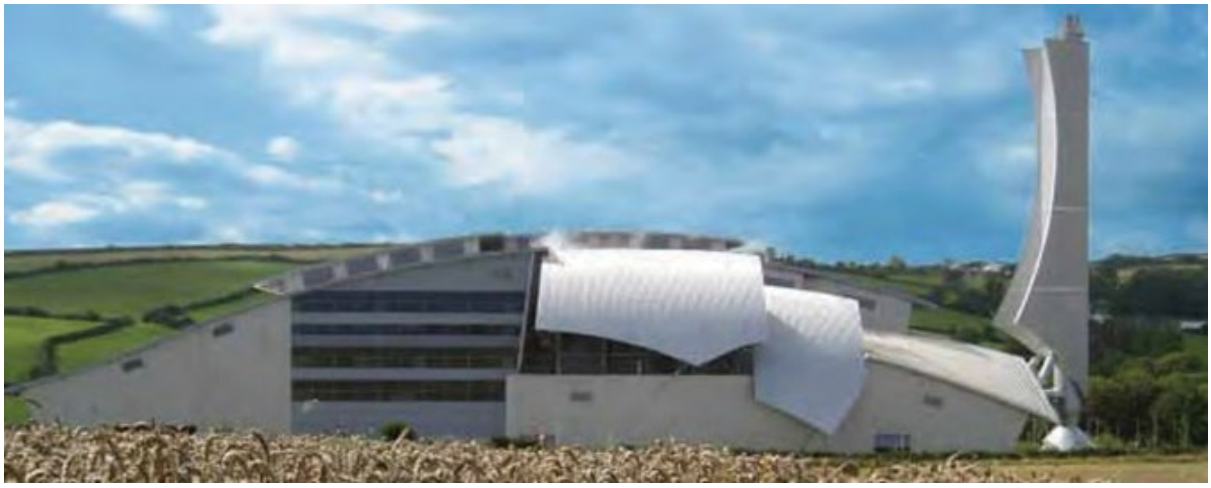
4.70 Proposals for EfW plants are highly sensitive. Key design considerations will include:

- siting and scale of operation including stack height;
- traffic management and highway impacts;
- air emissions and dispersion modelling;
- disposal of residues; and
- distribution of electricity and, where applicable, heat.

Landfill

4.71 Landfill remains the final disposal option for wastes that cannot be treated by means higher up the waste hierarchy (recycling or recovery). This SPD does not cover landfill design in detail but may be relevant to ancillary built development at landfill sites, such as control offices, fencing, lighting, and landfill gas power generation plant. Key design considerations for these will largely be the minimisation of landscape impact.

5. General Design Consideration



Energy from Waste Facility, Isle of Man – a good example of an innovative landmark building. The curve of the main structure takes its form from the surrounding hills. Although not hidden from the surrounding landscape, the resulting building is in harmony with it. The stack, in keeping with the island's heritage was designed to resemble a 70m high Viking Sail.

Location of Facilities

5.1 The numerous different types of facility and their associated issues dictate that different locational guidance has to be provided for each. However, there are also general points which will be equally applicable to all.

5.2 Waste management in the UK is rapidly moving from a primary activity based upon relatively simple waste transfer and landfill disposal or incineration to a far more sophisticated process focused on increasing recycling and treatment of wastes by new and more sustainable technologies. The legacy of historic practice is a public image of a crude cost-driven industry with significant environmental impacts. Waste facilities are therefore seldom welcomed in any location and are viewed with low regard.

5.3 Whilst landfill and waste transfer remain a necessary part of any wider waste management strategy, facilities with new and advanced technologies share some characteristics with more general industrial or manufacturing facilities, with inputs regarded more as a resource than a waste.

5.4 The selection of potential locations for new waste facilities needs to take into account many competing factors. Combined with the significant number and broad range of facilities required, there will be greater pressure on available development land to accommodate waste management activities. High quality design will be instrumental in making such development possible and reversing the commonly held negative image of enclosed built facilities.

5.5 Waste facilities will need to be developed in a range of locations. For all facilities, sites at risk from flooding should be avoided unless appropriate mitigation measures are agreed with the Environment Agency. Landfill sites, composting operations and open inert waste recycling facilities need

significant buffer zones from residential or sensitive land uses. This leads towards countryside settings which offer the opportunity for significant screening. Existing industrial estates or land zoned for employment should be able to accommodate fully, or sometimes partially, enclosed facilities, provided that it is demonstrated that impacts are controlled. The design of facilities close to airports will have to take into account any safeguarding restrictions.

5.6 In designing facilities for countryside locations, satisfactory access must be provided to the main road network, or rail or water transport connections. Statutory designations must also be taken into account (e.g. AONB and those for nature conservation and the historic environment). Landscaping measures should be developed with native species in the local context and opportunities to develop new or enhance existing ecological interest should be considered. Prominent linear earth embankments are unlikely to be appropriate. Re-use of large, modern agricultural barns may be acceptable in certain circumstances, but new facilities should aim for more innovative solutions through the use of colour, form, and materials.

5.7 Co-location of facilities can lead to reduced traffic movements, for instance where a HWRS or MRF adjoins a treatment plant which can handle residues.

5.8 In urban areas, designs should contain and minimise environmental impacts. External colour and form should take into account the local context. In certain circumstances, there may be the opportunity for landmark buildings. In general, the following locational criteria apply.

- Certain waste facilities are most likely to need to be situated in rural areas such as landfills, windrow composting, or inert waste processing. These should be in locations which are easily accessible but distant from residential and other sensitive properties.
- Business parks and industrial estates, generally located away from residential areas but with good infrastructure links, may be suitable for waste transfer stations, MBT plants, energy from waste plants, MRFs, in-vessel composting, and gasification plants.
- Sites on the edge of a settlement with good road links may be suitable for HWRSs and could allow combined vehicle trips from residential areas. Closed system pyrolysis plants could also be considered due to their lower impacts.

Alton Materials Recovery Facility, which is situated adjacent to the major road network.

Traffic and Accessibility

5.9 All waste facilities generate traffic and the effect on the wider highway network will be an important consideration to any proposal for new development. In working towards sustainable transport, the potential for using rail and waterborne waste delivery and collection systems should be explored in the context of reducing road traffic.

5.10 Waste may be delivered to a facility in a wide variety of vehicles ranging from private cars (for instance at HWRSs) to large, specialist refuse collection vehicles. Where members of the public and commercial users or contractors servicing facilities are present at the same time on the same site, traffic conflicts should be minimised and where possible kept separate. This may mean providing separate or split entrances for different users. The use of height restriction bars or other traffic calming systems may be appropriate to ensure that large or heavy commercial vehicles cannot access areas designed solely for cars or light vans.

5.11 Facilities where waste deliveries are likely to occur over concentrated periods will need to plan for sufficient queuing space to avoid local traffic congestion. Peak periods will vary depending on the facility. Those handling collected household waste may take deliveries on public holidays.

Delivery of inert material.

5.12 Vehicles arriving before opening hours may be forced to queue on the public highway unless sufficient room is left between the highway edge and the entrance gates. However, the practice of attempted deliveries outside opening hours should be avoided. Comments on litter and fly-tipping and the location of entrance gates are discussed in a following section.

5.13 The removal of residual waste and other products is often in bulk. The use of the largest articulated HGVs can reduce the overall number of traffic movements and facilities need to provide sufficient and well-planned manoeuvring room to safely and efficiently accommodate such vehicles. In addition, flexibility in the timing of removal of bulk outputs may be used to stagger traffic movements throughout the day, where possible avoiding peak hours.

5.14 Traffic circulation on site should be designed to promote the free flow of vehicles with minimum conflicts and congestion. The requirement for reversing should be minimised and sufficient parking should be provided for staff and any plant or vehicles working from the site. The reduction of use of private transport by staff should be encouraged and walking, cycling, public transport and car sharing should be promoted.

5.15 Safe pedestrian and cycle access should be provided for staff and visitors. Traffic can generate noise, dust, and fumes and traffic circulation routes should maximise the distance to sensitive receptors.

5.16 Key principles are:

- Use sustainable transport systems.
- Keep members of the public and commercial or service vehicles separate.
- Plan for efficient traffic circulation to avoid on and off-site congestion and conflict. Provide sufficient room for safe manoeuvring and parking.
- Keep traffic away from sensitive receptors.
- Integrate facilities into existing route networks or introduce upgrading as appropriate – look at movement flow in area as a whole and establish methods for sustainable transport.
- The facility should be able to be accessible to large HGV traffic without compromising another road.
- The road network should not be the only consideration, the use of rail halts and waterways or the sea should also be considered. A working port environment could potentially house numerous facility types.
- Sites should be located close to their particular requirements for example HWRSs should be accessible from residential areas. The recycling of inert materials could be undertaken in quarries or adjacent to working quarries. Combining facility types will also reduce traffic movements, particularly where a facility relies on specific material after it has undergone a sorting or treatment process such as shredded material.
- Minimise vehicle movements during both construction and operational phases.
- Endeavour to use fuel and energy supplies from sustainable sources.

Noise

5.17 The identification of sensitive noise receptors, potential noise impacts and any mitigation is an essential part of a planning application for a waste management facility. Noise will be generated by traffic, plant, and equipment operating on site. Where buildings are involved, it will be necessary to study the effects of noise reflecting from surfaces and reverberation.

5.18 If required, a noise report by a specialist consultant will identify noise impacts and options for mitigation. The latter may include the provision of acoustic barriers or rearranging operations to reduce noise impacts.

5.19 Acoustic barriers include earth bunds, walls and fences, and even complete enclosure of operations in a building. The height and design of barriers will be determined by the level of attenuation required, but consideration must also be given to external appearance and landscape

impacts as well as taking into account the space required for their installation.

5.20 Acoustic barriers can have other complementary roles such as reducing landscape and visual impacts and attenuating dust emissions. These matters need to be considered together.

5.21 Planning the operational site layout to minimise noise impacts includes siting any buildings in between operations in the open and sensitive receptors. Adjusting site opening hours or the times at which certain operations are carried out, can also help to reduce impacts.

5.22 Buildings should be assessed for reverberation and this may influence the design and specification of components such as cladding. The locations of mechanical plant, such as dust extraction or control equipment, will need to be taken into account.

5.23 Key principles are:

- assessment of noise impacts and mitigation requirements;
- acoustic barriers should provide the required level of attenuation but may have other roles;
- working hours and operational layouts can reduce noise impacts.

Air Quality and Odour

5.24 Dust emissions can be generated by the waste material itself, waste handling and treatment operations, and by the movement of traffic around the site. Dust control is often a matter of good housekeeping, but certain aspects of design can assist in reducing the potential for impacts.

5.25 Operational layouts should be designed to avoid wind corridors which have the potential to raise dust. Solid and permeable barriers, including tree and shrub belts, may be used to reduce wind velocities or direct air currents away from areas where waste is handled or stockpiled.

5.26 Open facilities can be provided with automated sprinkler or mist systems to prevent and suppress dust emissions. Unsurfaced areas subject to heavy traffic should be minimised.

5.27 In some circumstances, consideration may need to be given to partially or fully enclosing some or all operations to reduce the risk of dust emissions to the absolute minimum. Where this is required, dust suppression within the building will need to be provided and suitable vehicle access systems will be necessary, such as high-speed shutter doors.

The use of enclosed, controlled environments to prevent odour emissions.

5.28 Wastes or processes which generate other particulate, gaseous, or odorous emissions will need particular mitigation systems. These may include fully enclosed operations under negative pressure with exhausts processed via mechanical or biological filters. Certain technologies may produce emissions that can be released to the atmosphere via vents or chimneys. These will need to meet the relevant environmental regulation and control standards, but beyond that they will need to be designed for the minimum visual impact.

5.29 Key considerations for air quality include:

- avoiding or mitigating high velocity winds around sites;
- partial or full enclosure to reduce dust;
- systems to fully control emissions to atmosphere where required.

Pests, Vermin, and Litter

5.30 Pest and vermin control at waste management facilities is typically achieved through the use of traditional methods including pesticides. Design measures that can assist in reducing infestation (and litter) include minimising areas where waste can accumulate, for instance the gap between storage bay walls and perimeter fencing or building side cladding. Areas where birds may perch or nest should be minimised and netting or other guards and deterrents may be installed. Drains should be fully enclosed and accessible for inspection and cleaning. Capacity should be made available to allow waste storage areas to be periodically completely cleared to allow, amongst other things, inspection, and repair to prevent rodent access.

5.31 Litter can arise from the uncontrolled storage of waste and spillages. A priority will be to contain any litter and ensure that it cannot leave the site. Facilities where light waste is stored in the open will need particular attention, with measures such as litter netting and wind attenuation fencing.

Leicester MBT 'Ball Mill' Site, an example of how a site can be kept clean and litter free through appropriate storage and fencing.

5.32 Accumulations of litter are unacceptable and should be cleared immediately through standard housekeeping and operational procedures.

5.33 Land immediately around waste management facilities can be the target of fly-tipping. Good design can help by minimising hidden areas around

the site boundaries or using fences and gates to restrict access to them. Where appropriate, prominent security measures, including CCTV and sensitive lighting, are also of assistance.

5.34 Access points with entrance gates set back from the highway boundary can be a natural fly tipping target. Improving the visibility of the entrance can help reduce the risk along with security measures.

Water

5.35 The protection of groundwater and surface water falls within the remit of the Environment Agency, which will be consulted on such matters at the planning application stage and regulated at the waste licensing or permitting stage.

5.36 Facilities where waste is handled or stored in the open carry a risk of polluting groundwater or surface water. Protection measures are likely to involve hard, impermeable surfacing and drainage of potentially contaminated water to foul sewers, treatment plants or sub-surface sealed tanks.

5.37 To minimise the volume of potentially contaminated water, open waste storage areas should be minimised or covered. Opportunities for the re-use of any captured water, such as in dust suppression or vehicle washing should be investigated, subject to any necessary environmental control requirements.

5.38 Rainwater from roofs and gutters will typically be directed to surface water drains or soakaways. The potential for rainwater harvesting should be investigated with water stored for a number of possible uses to replace some element of mains supplies.

5.39 Where pollution control requirements allow, Sustainable Drainage Systems (SuDS) are an alternative to conventional drainage aimed at replicating natural drainage and dealing with run- off where it occurs. Techniques include porous pavements, swales, infiltration basins and wetlands. SuDSs should be considered for dealing with site drainage and will be particularly relevant to larger sites.

Energy from Waste plant in Cheneviers, Switzerland. Large facilities can be sited adjacent to water without detrimental impact. This plant highlights how a sensitive design with appropriate landscaping can integrate into the landscape (although the stacks clearly dominate and detract).

Landscaping and Design

5.40 This guidance is intended to assist with producing a suitable design for various types of waste facilities. It is not intended to enforce any particular architectural style or layout, merely to describe how development could make a positive contribution to producing an attractive and sustainable environment.

5.41 Although each site and type of facility should be assessed individually, there are general criteria which can be applied:

Natural Environment

5.42 Proposals should provide a robust and complementary landscaped edge to sites in rural locations. Where facilities are located in a rural area not only the building, but the landscaping should also reflect the existing landscape character. Native species should be used where possible with others justified where relevant.

5.43 The transition between the proposed facility and other adjacent sensitive urban or rural land use should be positively designed and managed to ensure a successfully integrated form of development.

5.44 Even where a facility is designed as a landmark building, the landscaping must form an integral part of the design.

5.45 Where facilities are placed next to more sensitive environments, adequate boundary screen and internal planting must be undertaken to soften views of the building and the operational areas specifically.

5.46 When considering landscaping, the nature, scale, and layout of the waste facility should dictate the size and location of planting. Small pockets of planting with little function are of limited value and are likely to become problem areas to maintain rather than enhancing the site.

5.47 Existing areas of mature trees and hedgerows should be integrated into the landscape scheme or where possible become important features within the site. Their retention can be essential in locations where functional buildings and vast areas of hard surfacing dominate, particularly where the site can be seen from distant public viewpoints. It is understood however that there is a balance to be found between the provision of landscaping and the operational requirements of facility.

5.48 All sites should maintain and, where appropriate, enhance existing ecological value and sustain wildlife habitats. Proposals should seek to avoid protected habitats, and should provide creative solutions to habitat creation, translocation, and maintenance. Where appropriate developers should demonstrate how their proposals provide long term protection for species and habitats.

5.49 Where a proposal is adjacent to existing public open space, the proposed design should not compromise the functionality or safety of the space. Where possible the development should enhance or assist in the maintaining the aesthetics of such spaces. There should be unacceptable impacts on users of public rights of way.

This building is not actually industrial in use although it takes on such a form. It highlights how you can use what could be conceived as predominantly harsh materials, whilst assimilating well into its landscaped setting.

Three photos that show how utilising sites with existing mature vegetation can provide the most appropriate buffer, particularly where there are sensitive surrounding uses, such as residential areas.

Built Environment

5.50 Proposals should be informed by, and positively respond to, the surroundings and specific influences of the site, including technical and environmental considerations. Proposals should respond innovatively to their setting by creating a clear relationship between the built and natural elements.

5.51 The visual impact of colours and types of materials is extremely important. The appearance and finish of wall and roof cladding materials should be considered in relation to the surrounding environment and immediate context of the building. The impact upon the townscape or landscape of any proposal should also be assessed in long views and views from higher ground, particularly in the case of taller or bulky buildings.

Feature colours have been picked out on this waste facility in Denmark. Pedestrian access has been highlighted with red doors, whilst the main vehicle access is emphasised by the bold yellow colouring.

This award-winning development highlights how different roof forms and materials within the same building can signify and welcome different types of user. The angular accented roof shapes supported by large pillars are functional and obvious as an industrial space accommodating vehicle, whilst the curved roof section, with its glazed façade has a pedestrian scale entrance. It also shows how a single building can successfully segregate a delivery area thereby minimising conflict.

5.52 Generally, less saturated, and non-reflective materials reduce the impact of a building especially where large roof forms are proposed. This does not mean that choice is compromised, merely that colour choice should be justified. If for example, a landmark building is proposed, or by the nature of the proposal the building will be highly dominant in the town or landscape, the use of a bold design with contrasting materials and colours may be appropriate, with colour and reflective materials used to highlight features within the design.

5.53 The design should create positive views, vistas, and panoramas, either by lifting existing views in and around the site, or by creating buildings and spaces which respond sensitively to their surroundings.

5.54 Where the visiting public is expected at a facility, this should not only be a functional visit, but where possible also educational. Where practical, space should be made available to provide information to visitors. In many situations a specific educational area could be provided to allow school children or organised groups to understand the recycling or other processes involved.

5.55 Where a visitor centre is provided, it should be capable of accommodating groups of up to 40 people with: viewing facilities and pathways for visitors around the waste management facility; toilets; hand-washing facilities; and visitor parking. It must be fully compliant with all applicable legislation and guidance including requirements for disabled access.

5.56 Housing new waste management treatment technologies in buildings which reflect sophisticated and advanced developments will assist in improving the image and public acceptability, both locally and in a wider context.

5.57 With regard to servicing and deliveries, the objective is to control any potential impact from noise or disturbance and possible danger from vehicles making deliveries and servicing. Through careful design, this can be minimised by siting delivery and storage areas away from sensitive uses or behind frontage buildings to reduce their impact on neighbours and the general appearance of the area.

5.58 Where there is no option but to provide frontage delivery and storage areas adjacent to the public realm (particularly if these are to be filled with skips, recycling material bins, etc), they should be enclosed either by boundary walls, unobtrusive fencing or structural landscaping as the location dictates. Where the facility is sited within a mixed-use area, chain link or steel palisade fences may be considered as inappropriate boundary treatment to the public realm. These detract from the streetscape and impose a negative image on the area.

5.59 The means of enclosure is also an important security consideration and the design and layout of new development should minimise the opportunities for crime. Although it is not specifically written for this type of development, many of the recommendations in this document are interpreted from 'Secured by Design: Commercial Development'. In this respect, consultation with the Sussex Police Architectural Liaison Officer should be undertaken, particularly as many waste facilities have had a negative image in the past.

Whilst security is of great importance, fencing should be aesthetically pleasing – unpainted palisade fencing detracts from the natural environment.

Urban Areas

5.60 Integrate built form – there should be continuity of positive built form in urban areas to ensure that it is incorporated as an integral part to the settlement.

5.61 If a facility is sited within an urban area, the public realm (roads, streets, and spaces) is of the utmost importance. This must not just be seen as a consideration for residential and commercial developments, but also for waste facilities. The way in which proposed buildings, layout within the site, and their activities relate to the street can impact upon all users of the public realm. Different considerations must apply than to other types of development, but if it is deemed that the proposed facility would be a 'good neighbour', it should be able to operate without the design adversely affecting other people or the general environment.

5.62 Due to the scale and type of operations involved, it is often the case that 'private' space is routinely exposed to public view. In many instances this will allow a view of storage yards and associated paraphernalia, car parks and fences of varying styles and condition, all of which can degrade the environmental quality of the public realm.

5.63 Buildings are generally the most effective way of screening public from private spaces. However, this is not always appropriate with waste facilities due to potential problems with noise, odour, etc. However, where there are ancillary offices, meeting spaces or other uses with

acceptable public façades, it may be appropriate to site these buildings close to front boundaries thus giving them a 'public face' and assist with screening the operational areas beyond. Therefore wherever possible, the layout and design of new facilities in mixed use areas will be expected to either front buildings onto the public realm and to enclose 'private' external spaces, such as yards and car parks, behind them, or demonstrate how this concept has been considered.

Portsmouth Energy Recovery Facility, which has a successful street frontage with its operational areas sited to the rear of the plot.

5.64 In urban areas a wider palette of modern materials may be suitable. Again, these should be informed not only by the specifics of the facility, but also the site and its surroundings.

5.65 In urban settings, a wider range of built form may be appropriate. Simple steel portal frame buildings have their place on industrial estates with similar buildings, but more innovative, less angular, and sometimes more prominent designs should be considered. They should be sensitive to their surroundings and draw upon local distinctiveness.

5.66 Large buildings can help to create identity and a sense of place. Such buildings can provide a focal point for an area and draw on the local vernacular and historic associations to reinforce local identity. Many well-designed large utilities buildings are viewed as architectural icons. Such innovation and high-quality design will be encouraged.

The design of the chimney on the Isle of Man, derived from a Viking sail reinforces the local identity and historic associations of an area.

5.67 Proposals for certain facility uses should be capable of being integrated with residential uses. In all cases, good design can ensure that they can act as 'good neighbours'.

5.68 Where materials are stored in open yard areas within a site, they should not be stacked above boundaries or building eaves, where they are visible from the public realm.

5.69 All signage must be clear to read and sited in an appropriate location. Too many signs can become difficult to read and create a cluttered view, signage should therefore be amalgamated where possible.

Clear, helpful signage at the Chichester HWRS.

Rural Areas

5.70 The layout and detailed design of new waste facilities must ensure that it is appropriate to its context and does not detract from the character of the County's rural areas. This is particularly important in AONBs, including the area covered by the proposed South Downs National Park.

5.71 There are distinctive character areas across the County, which are defined by each relevant local authority. Where a District Council or AONB organisation produce a landscape assessment or any other form of design guidance, it is essential that these documents are referred to before detailed proposals are drawn up.

5.72 Within rural areas the landscape should be the dominant factor and the design of buildings should reflect this rather than vice versa. As such, buildings and areas of hard landscaping should be set within the existing topography and landscape, appropriately enhanced where necessary. New buildings, where possible, should not break the skyline or detrimentally impact upon the surrounding ground levels.

5.73 Rural facilities do not necessarily have to take on the form of agricultural buildings. Where the buildings required are large scale, traditional agricultural forms could be inappropriate. To duplicate large modern barns is unlikely to be acceptable and a more innovative design solution should be sought.

5.74 Where appropriate the building should reflect the local vernacular both in built and/or landscape form. This does not mean that design should be a pastiche of typical large buildings, but instead draw from surrounding influences.

5.75 The design of waste facilities in rural areas should take into account the following considerations.

- Facilities should not have materials stored uncovered due to aesthetic impact and potential problems from litter and vermin, nor should they be visible from public vantage points.
- Security fencing where required should be painted and not left as bare metal, and also be accompanied by planting to soften the effect. Naturally deterrent, spiky plants can assist with security.

- Signage should be minimal, clear, and informative. It should also be of an appropriate size and colour.
- Lighting should be sufficient to provide adequate lighting for the task and security without detriment to the surrounding countryside. This is particularly important where there are long distance views into a site. Lighting should be designed to minimise the amount of glow, glare, and flicker. Options for the siting, hierarchy and layout of lighting should be developed and tested as an integral part of the design of the site as a whole.
- Buildings should be of a colour to blend in with the surroundings. Highly reflective chimneys or brightly coloured roof treatments are unlikely to be acceptable without valid justification. External hard surfaced areas should also be considered in terms of colour and materials.
- Facilities should not be built within 5m of a watercourse to prevent contamination.
- Landscaping within the site should be functional and enhance the facility, and not left as bare patches of grass or shrubs without purpose.
- Where a site is appropriate for a waste facility, but there is no existing vegetation to screen the buildings, an integrated landscape scheme is likely to be required.
- The use of steep bunds to screen buildings is unlikely to be successful as it is difficult to establish and maintain planting upon them. Where a change in level is required (and will not affect existing habitats), this should be gradual to allow screen planting to become established and provide a wider, more effective planting area.

5.76 Large buildings in rural settings can draw upon landscape influences such as in the case of the Downland Gridshell. In many cases a timber framed building would be incompatible with a built waste facility, but it is an example of how form and structure can blend and complement the surrounding landscape with the roof form echoing the rolling hills.

The Downland Gridshell highlights how the use of innovative designs can accommodate buildings which require a large roof form within a rural setting.

5.77 Built form in a rural setting should generally be designed to achieve the minimum impact on the local landscape. Where possible, low profiles should be used, potentially requiring local lowering of the surface.

Colours will be muted with the general aim of blending in with the surroundings. The impact of security fencing and gates and any other ancillary infrastructure should be reduced by suitable landscaping treatment.

5.78 Where facilities are proposed within rural areas, the use of structural landscaping is likely to be the most suitable method of screening areas of open storage. This should be designed in conjunction with the buildings themselves and be integrated within the overall proposal. Loading bays, bin stores, outdoor storage (where allowed), mechanical plant, and other operational requirements should also be incorporated into the overall design.

5.79 All site works and finishes provided should be in accordance with Good Industry Practice and all Legislation and comply with best practice in the waste management industry, in addition to conforming to the requirements of the relevant consents.

Energy Efficiency and Sustainability

5.80 Although proposals for waste facilities are designed to comply with sustainable aims, the actual construction of the buildings and the landscaping of the site should also meet sustainability objectives. Proposals will therefore be expected to demonstrate how they comply with Development Plan policies which promote energy efficient development.

5.81 As many proposals will be for large-scale buildings, there is the potential to create exemplary buildings which demonstrate the latest innovations in high-energy efficiency, use of renewable energy, and environmentally sustainable construction techniques.

5.82 The Building Research Establishment has, over the last decade, devised an Environment Assessment Methodology (BREEAM) which has become the benchmark of measuring the environmental performance of buildings. The standards of BREEAM comprise a comprehensive set of criteria within nine environmental categories that can be applied to a proposal of any size. These categories can be used at the design stage of a scheme and applicants are encouraged to take them into account. The categories are:

- management;
- energy use;
- health and well-being;
- pollution;
- transport;
- location-related factors;
- land use;
- ecology;
- materials; and
- water.

5.83 BREEAM is based on a points' system whereby points are awarded for each element of the assessment which has been achieved, with certain

categories given more weight than others. An overall 'score' determines a building's BREEAM Rating. Ratings are classed as PASS, GOOD, VERY GOOD, or EXCELLENT. A principle of BREEAM is to allow for a balanced approach between environmental matters of a proposal, rather than focusing on a particular issue. Although there is no specific guidance for waste facilities, many of the standards for industrial buildings can be applied where appropriate.

5.84 BREEAM also produce a number of publications which can help in ensuring that the building process, re-use of buildings and use of materials is as environmentally sustainable as possible, such as The Green Guide to Specification (BRE 2002).

5.85 As a general guide, applicants should consider how in the building process their proposals:

- maximise energy conservation through the use of recovered and recycled materials and products for design and building construction;
- re-use and or adapt existing buildings on site where viable;
- impact on the local air quality having regard to local Air Quality Management Areas and relevant Air Quality Action Plans;
- contribute to CO_2 emissions in the manufacture of construction materials required by the development and measures to be taken to address this impact;
- utilise opportunities for making best use of local resources to reinforce local identity and reduce delivery distances, etc, and/or renewable building resources, such as timber from a sustainably-managed source;
- provide additional features which assist with the energy and water efficiency of the buildings and landscaping themselves and not just the proposed use of the facility, such as lighting, grey water recycling, use of solar energy, and passive solar gain;
- provide a landscape strategy using environmentally sustainable principles including the use of renewable materials, sourcing materials locally and use of sustainable landscape management practices;
- could support Sustainable Drainage Systems, particularly as many types of waste facilities frequently have large expanses of hard surfacing;
- could support grey water recycling as again, large plant buildings often have roof forms which are ideal for rainwater capture and reuse in the form of grey water recycling. This is particularly the case where the processes involve generous water consumption;
- could support the use of solar energy - any large expanse of roof will also offer opportunities for exploiting solar energy (in appropriate locations);
- could promote opportunities for the use of local labour during construction and the use of local companies for sub-contracting; and

- could minimise the generation of construction and demolition waste and re-use or recycle waste that is generated through a Site Waste Management Plan.

5.86 An alternative is the Civil Engineering Environmental Quality and Awards Scheme (CEEQUAL), which uses a credit-based assessment framework, which is applicable to any civil engineering project. It includes environmental aspects, such as the use of water, energy, and land, as well as ecology, landscape, nuisance to neighbours, archaeology, waste minimisation and management, and community amenity.

5.87 These schemes were running at the time of publication, however they may have subsequently been updated and proposals should therefore follow the most up-to-date guidance.

Biodiversity and Geodiversity

5.88 All sensitive ecological designations need to be identified at the site selection stage. Key designations include:

- Sites of Special Scientific Interest (SSSI);
- Special Areas of Conservation (SAC);
- Special Protection Areas (SPA);
- Ramsar Sites.

5.89 SSSIs are designated for reasons of national importance. The other three are designated under international legislation and are collectively protected under the Habitats Regulations. There may also be ecological sites that are protected under local policy, for example Sites of Nature Conservation Importance (SNCI) and Regionally Important Geological Sites (RIGS).

5.90 The local ecology can be affected by:

- disturbance (traffic, human presence, noise, vibration);
- smothering (dust, litter);
- habitat Loss (development, monitoring infrastructure);
- siltation (dust, surface water runoff, mud);
- nutrient enrichment (surface water runoff);
- predation (rodents, gulls, corvids).

5.91 The potential risk of a waste facility impacting on such sites will need to be addressed in any planning application. If required, an Ecology Survey by a specialist consultant will identify the potential impacts and options for mitigation. This would usually be undertaken in consultation with the Regulatory Authorities.

5.92 In the event that the operation may impact on a European site (SAC, SPA, or Ramsar), then an Appropriate Assessment may be required in accordance with EU legislation.

5.93 The operation of a waste facility within an enclosed structure will minimise the potential impacts. The main considerations once the site has been

selected will be to minimise dust and litter emissions, manage surface water and reduce the likelihood of pests.

5.94 The development should provide enhancement measures to bring positive effects to any surrounding designated sites and increase biodiversity. This could be achieved, for example, through retention of existing habitats of importance, landscaping to maximise opportunities for wildlife, use of indigenous species in landscaping, and use of conservation management or relocation plans.

5.95 Key principles are:

- Ecological Assessment, if required;
- mitigation measures incorporated into the design; and
- provision of ecological enhancement.

Cultural Heritage

5.96 The location of a waste facility will need to consider any potential impact on the cultural heritage. This can include existing and former features of the man-made landscape, encompassing the changes made to the environment by human activity, as well as archaeological sites and artefacts.

5.97 The planning application will need to identify any Scheduled Ancient Monuments, Conservation Areas, Listed Buildings, and other sites of archaeological importance.

5.98 This information will be available through County Records, English Heritage, and local council records and maps.

5.99 The cultural heritage can be affected by:

- land loss;
- severance;
- visual intrusion; or
- noise, odour, traffic, and other environmental impacts.

5.100 The location of a waste facility in designated areas should be discussed at an early stage with the relevant authorities.

5.101 It is also recommended that a 'watching brief' is maintained during the construction phase, involving attendance on site by a suitably-trained archaeologist during any operations likely to uncover or disturb features of archaeological interest.

5.102 Key principles are:

- assessment of impacts on cultural heritage;
- Archaeological Assessment, if required;
- mitigation measures incorporated into the design; and
- undertaken Watching Brief during construction.

Lighting

5.103 All waste facilities are likely to require external lighting for those operational hours in darkness. The locality of a site will determine the likelihood of light pollution causing a nuisance.

5.104 Lighting must therefore be considered during the design stage. The need for lighting should be kept to a minimum in sensitive areas such as residential and open spaces. External lighting should be used therefore on access roads and building entrances. The building should be orientated to that the lighting needs can be restricted to the less sensitive aspects.

5.105 Lighting should also be considered in the context of sustainability to ensure efficient use of energy.

5.106 Key principles are:

- incorporate lighting measures within the design stage; and
- minimise lighting to key areas of the site.

In urban areas a bold lighting scheme which enhances the building could be considered, such as this facility in Tyseley, Birmingham.

Restoration and Aftercare

5.107 Where appropriate, consideration should be given to the proposed after-use of the site. For example, if the site has a known estimated lifespan, the design of the buildings, structures, areas of hardstanding, landscaping, etc, should where possible, allow for a transition to an after-use with minimal waste of materials and energy.

6. Design Mitigation Measures

A refuse vehicle in West Sussex with a clear message encouraging recycling.

6.1 The previous section identified the design criteria for a range of waste facilities. It also identified the key principles in determining the location of new facilities, including some mitigation measures to minimise the impact.

6.2 The mitigation measures that should be considered in the design of new facilities have been summarised in the following tables.

6.3 Other non-design mitigation measures, such as hours of operation, specific waste handling methods, waste, storage, and type of plant/machinery use, have not been detailed here.

6.4 It should also be noted that the facilities discussed will be subject to a PPC permit or a Waste Management Licence, which will ensure that the facilities operate in accordance with any legislative limits on emissions as well as general operational practices (see 'Legislative Framework and Relevant Guidance' section on page 5).

Key Considerations with Mitigation

MRF

Design Consideration	Mitigation Measure
Landscape	▪ Design of building will depend on local context, but should take an appropriate form, massing, and size as well as use appropriate materials, colours and detailing to seek to enhance the local landscape where possible. ▪ Appropriate orientation and reprofiling of ground should be considered where appropriate. ▪ Tree and hedgerow planting. ▪ Appropriate design, positioning, and colour of fencing consistent with setting. ▪ Hard landscaping including soil bunds where appropriate.
Traffic/Access	▪ Design internal roads and operations for ease of access and vehicle routing and manoeuvring. ▪ Good access to site and facility including necessary visibility splays. ▪ Provision of adequate parking for operator vehicles, staff and visitors and encourage sustainable transport for staff.
Noise	▪ Design of building with acoustic features, e.g. sound proofing. ▪ Appropriate orientation of building. ▪ Acoustic fencing. ▪ Hard landscaping, including soil bunds. ▪ Fit silencers to plant and machinery. ▪ Use of 'Smart' reversing bleepers.
Dust	▪ Unlikely to be a nuisance with this waste stream. ▪ Dust suppression system integral to the building design and machinery should be considered. ▪ Wheel Cleaning facilities should be considered.
Odour	▪ Odour unlikely to be a nuisance with this waste stream. ▪ Odour suppression can be incorporated into dust suppression system. ▪ External odour suppression system e.g. deodorising sprays.
Litter	▪ Internal design with storage bays. ▪ External litter fences.
Pests	▪ Vermin Proof design. ▪ Drainage system to be fitted with grates. ▪ All ventilation and ducts should be fitted with bird cages. ▪ Rapid shutting doors. ▪ Operational Management Practices.

Design Consideration	Mitigation Measure
Water Protection	▪ Provision of sealed drainage system. ▪ Engineered containment. ▪ Recirculate water. ▪ Separate collection of roof water.

Open Window Composting

Design Consideration	Mitigation Measure
Landscape	▪ Design of building will depend on local context, but should take an appropriate form, massing, and size as well as use appropriate materials, colours and detailing to seek to enhance the local landscape where possible. ▪ Tree and hedge planting and appropriate fencing. ▪ Hard landscaping including soil bunds. ▪ Appropriate orientation and reprofiling of ground.
Traffic/Access	▪ Design internal roads and operations for ease of access and vehicle routing and manoeuvring. ▪ Good access to site and facility including necessary visibility splays. ▪ Provision of adequate parking for operator vehicles, staff and visitors and encourage sustainable transport for staff.
Noise	▪ Acoustic fencing. ▪ Hard landscaping, including soil bunds. ▪ Fit silencers to plant and machinery. ▪ Use of 'Smart' reversing bleepers.
Dust	▪ Dust suppression ▪ integral to operational procedures. ▪ Operational Management Practices. ▪ Hard landscaping, including soil bunds. ▪ Wheel Cleaning facilities.
Odour	▪ Odour suppression integral to operational procedures. ▪ External odour suppression system e.g. deodorising sprays. ▪ Use of aeration pumps.
Litter	▪ Unlikely to be a nuisance with this waste stream.
Pests	▪ Operational Management Practices. ▪ Stock proof fencing.
Water Protection	▪ Provision of sealed drainage system. ▪ Engineered containment. ▪ Recirculate any leachate.

In-Vessel Composting

Design Consideration	Mitigation Measure
Landscape	▪ Design of building will depend on local context, but should take an appropriate form, massing, and size as well as use appropriate materials, colours and detailing to seek to enhance the local landscape where possible. ▪ Appropriate orientation and reprofiling of ground should be considered where appropriate. ▪ Tree and hedgerow planting. ▪ Appropriate design, positioning, and colour of fencing consistent with setting. ▪ Hard landscaping including soil bunds where appropriate.
Traffic/Access	▪ Design internal roads and operations for ease of access and vehicle routing and manoeuvring. ▪ Good access to site and facility including necessary visibility splays. ▪ Provision of adequate parking for operator vehicles, staff and visitors and encourage sustainable transport for staff.
Noise	▪ Design of building with acoustic features, e.g. sound proofing. ▪ Appropriate orientation of building. ▪ Acoustic fencing. ▪ Hard landscaping, including soil bunds. ▪ Fit silencers to plant and machinery. ▪ Use of 'Smart' reversing bleepers.
Dust	▪ Dust suppression integral to operational procedures. ▪ Dust suppression within reception building and external areas. ▪ Hard landscaping, including soil bunds. ▪ Wheel Cleaning facilities.
Odour	▪ Odour suppression can be incorporated into dust suppression system. ▪ External odour suppression system e.g. deodorising sprays. ▪ Use of biofilters to treat exhaust air. ▪ Operational Management Practices.
Litter	▪ Unlikely to be a nuisance with this waste stream due to strict input controls.
Pests	▪ Vermin proof design. ▪ Drainage system to be fitted with grates. ▪ All ventilation and ducts should be fitted with bird cages. ▪ Rapid shutting doors. ▪ Operational Management Practices.

Design Consideration	Mitigation Measure
Water Protection	▪ Provision of sealed drainage system. ▪ Engineered containment. ▪ Recirculate any leachate. ▪ Separate collection of roof water.

Anaerobic Digestion and Autoclave

Design Consideration	Mitigation Measure
Landscape	▪ Design of building will depend on local context, but should take an appropriate form, massing, and size as well as use appropriate materials, colours and detailing to seek to enhance the local landscape where possible. ▪ Appropriate orientation and reprofiling of ground should be considered where appropriate. ▪ Tree and hedgerow planting. ▪ Appropriate design, positioning, and colour of fencing consistent with setting. ▪ Hard landscaping including soil bunds where appropriate. ▪ Partial burial of digester.
Traffic/Access	▪ Design internal roads and operations for ease of access and vehicle routing and manoeuvring. ▪ Good access to site and facility including necessary visibility splays. ▪ Provision of adequate parking for operator vehicles, staff and visitors and encourage sustainable transport for staff.
Noise	▪ Design of building with acoustic features, e.g. sound proofing. ▪ Appropriate orientation of building. ▪ Acoustic fencing. ▪ Hard landscaping, including soil bunds. ▪ Fit silencers to plant and machinery. ▪ Use of 'Smart' reversing bleepers.
Dust	▪ Dust suppression integral to operational procedures. ▪ Dust suppression within reception building and external areas. ▪ Hard landscaping, including soil bunds. ▪ Wheel Cleaning facilities.
Odour	▪ Odour suppression can be incorporated into dust suppression system. ▪ External odour suppression system e.g. deodorising sprays. ▪ Negative pressure ventilation systems with biofilters. ▪ Operational Management Practices.
Litter	▪ Internal design with storage bays. ▪ External litter fences. ▪ Operational Management Practices.

Design Consideration	Mitigation Measure
Pests	▪ Vermin proof design. ▪ Drainage system to be fitted with grates. ▪ All ventilation and ducts should be fitted with bird cages. ▪ Rapid shutting doors. ▪ Operational Management Practices.
Water Protection	▪ All tanks and digesters within engineered containment. ▪ May require on site wastewater treatment.

Gasification and Pyrolysis

Design Consideration	Mitigation Measure
Landscape	▪ Design of building will depend on local context, but should take an appropriate form, massing, and size as well as use appropriate materials, colours and detailing to seek to enhance the local landscape where possible. ▪ Appropriate orientation and reprofiling of ground should be considered where appropriate. ▪ Tree and hedgerow planting. ▪ Appropriate design, positioning, and colour of fencing consistent with setting. ▪ Hard landscaping including soil bunds where appropriate. ▪ Height of stack to be considered in context of local setting.
Traffic/Access	▪ Design internal roads and operations for ease of access and vehicle routing and manoeuvring. ▪ Good access to site and facility including necessary visibility splays. ▪ Provision of adequate parking for operator vehicles, staff and visitors and encourage sustainable transport for staff.
Noise	▪ Design of building with acoustic features, e.g. sound proofing. ▪ Appropriate orientation of building. ▪ Acoustic fencing. ▪ Hard landscaping, including soil bunds. ▪ Fit silencers to plant and machinery. ▪ Use of 'Smart' reversing bleepers. ▪ Careful positioning of specific components such as air-cooled condenser.
Dust	▪ Dust suppression integral to operational procedures. ▪ Operational Management Practices. ▪ Hard landscaping, including soil bunds. ▪ Wheel Cleaning facilities.

Design Consideration	Mitigation Measure
Odour	▪ Odour suppression can be incorporated into dust suppression system. ▪ External odour suppression system e.g. deodorising sprays. ▪ Operational Management Practices.
Litter	▪ Internal design with storage bays. ▪ External litter fences. ▪ Operational Management Practices.
Pests	▪ Vermin proof design. ▪ Drainage system to be fitted with grates. ▪ All ventilation and ducts should be fitted with bird cages. ▪ Rapid shutting doors. ▪ Operational Management Practices.
Water Protection	▪ Provision of sealed drainage system. ▪ Engineered containment. ▪ Separate collection of roof water.

Inert Waste Processing

Design Consideration	Mitigation Measure
Landscape	▪ Design of building will depend on local context, but should take an appropriate form, massing, and size as well as use appropriate materials, colours and detailing to seek to enhance the local landscape where possible. ▪ Appropriate orientation and reprofiling of ground should be considered where appropriate. ▪ Tree and hedgerow planting. ▪ Appropriate design, positioning, and colour of fencing consistent with setting. ▪ Hard landscaping including soil bunds where appropriate.
Traffic/Access	▪ Design internal roads and operations for ease of access and vehicle routing and manoeuvring. ▪ Good access to site and facility including necessary visibility splays. ▪ Provision of adequate parking for operator vehicles, staff and visitors and encourage sustainable transport for staff.
Noise	▪ Design of building with acoustic features, e.g. sound proofing. ▪ Appropriate orientation of building. ▪ Acoustic fencing. ▪ Hard landscaping, including soil bunds. ▪ Fit silencers to plant and machinery. ▪ Use of 'Smart' reversing bleepers. ▪ Careful positioning of specific components such as concrete crusher.

Design Consideration	Mitigation Measure
Dust	▪ Dust suppression integral building and machinery. ▪ Operational Management Practices. ▪ Hard landscaping, including soil bunds. ▪ Wheel Cleaning facilities.
Odour	▪ Low risk with this waste stream.
Litter	▪ Unlikely to be a nuisance with this waste stream. ▪ Appropriate sheeting and storage as necessary. ▪ Operational Management Practices.
Pests	▪ Unlikely to be a nuisance with this waste stream. ▪ Operational Management Practices.
Water Protection	▪ Provision of sealed drainage system. ▪ Engineered containment. ▪ Recirculate water for dust suppression. ▪ Separate collection of roof water.

HWRS

Design Consideration	Mitigation Measure
Landscape	▪ Tree Planting and appropriate fencing. ▪ Hard landscaping including soil bunds.
Traffic/Access	▪ Design internal roads and operations for ease of access and vehicle routing (one-way system) and manoeuvring. Avoid queuing on public highway. ▪ Good access to site and facility including necessary visibility splays. ▪ Provision of adequate parking for operator vehicles, staff and visitors and encourage sustainable transport for staff. ▪ Separate service vehicles from public. ▪ Clear signage.
Noise	▪ Positioning of containers away from receptors (e.g. glass banks). ▪ Acoustic fencing. ▪ Hard landscaping including soil bunds. ▪ Fit silencers to plant and machinery. ▪ Use of 'Smart' reversing bleepers.
Dust	▪ Low risk with this facility. ▪ Operational Management Practices.
Odour	▪ Unlikely to be a nuisance with this waste facility. ▪ Operational Management Practices.
Litter	▪ Use of litter fencing. ▪ Appropriate sheeting and storage as necessary. ▪ Operational Management Practices.

Design Consideration	Mitigation Measure
Pests	▪ Unlikely to be a nuisance with this waste facility. ▪ Operational Management Practices.
Water Protection	▪ Provision of sealed drainage system. ▪ Engineered containment.

Waste Transfer Station

Design Consideration	Mitigation Measure
Landscape	▪ Design of building will depend on local context, but should take an appropriate form, massing, and size as well as use appropriate materials, colours and detailing to seek to enhance the local landscape where possible. ▪ Appropriate orientation and reprofiling of ground should be considered where appropriate. ▪ Tree and hedgerow planting. ▪ Appropriate design, positioning, and colour of fencing consistent with setting. ▪ Hard landscaping including soil bunds where appropriate.
Traffic/Access	▪ Separate Service vehicles from Delivery vehicles. ▪ Design internal roads and operations for ease of access and vehicle routing and manoeuvring. ▪ Good access to site and facility including necessary visibility splays. ▪ Provision of adequate parking for operator vehicles, staff and visitors.
Noise	▪ Design of building with acoustic features, e.g. sound proofing. ▪ Appropriate orientation of building. ▪ Acoustic fencing. ▪ Hard landscaping, including soil bunds where appropriate. ▪ Fit silencers to plant and machinery. ▪ Use of 'Smart' reversing bleepers.
Dust	▪ Dust suppression ▪ integral to operational procedures. ▪ Operational Management Practices. ▪ Hard landscaping, including soil bunds. ▪ Wheel Cleaning facilities.
Odour	▪ Odour suppression can be incorporated into dust suppression system. ▪ External odour suppression system, e.g. deodorising sprays. ▪ Operational Management Practices.
Litter	▪ Internal Design with bays. ▪ External litter fences. ▪ Operational Management Practices.

Design Consideration	Mitigation Measure
Pests	▪ Vermin proof design. ▪ Drainage system to be fitted with grates. ▪ All ventilation and ducts should be fitted with bird cages. ▪ Rapid shutting doors. ▪ Operational Management Practices.
Water Protection	▪ Provision of sealed drainage system. ▪ Engineered containment. ▪ Recirculate water for dust suppression. ▪ Separate collection of roof water.

Mechanical and Biological Treatment

Design Consideration	Mitigation Measure
Landscape	▪ Design of building will depend on local context, but should take an appropriate form, massing, and size as well as use appropriate materials, colours and detailing to seek to enhance the local landscape where possible. ▪ Appropriate orientation and reprofiling of ground should be considered where appropriate. ▪ Tree and hedgerow planting. ▪ Appropriate design, positioning, and colour of fencing consistent with setting. ▪ Hard landscaping including soil bunds where appropriate. ▪ Stack height for those facilities with air clean up systems needs to be considered in context of local setting.
Traffic/Access	▪ Design internal roads and operations for ease of access and vehicle routing and manoeuvring. ▪ Good access to site and facility including necessary visibility splays. ▪ Provision of adequate parking for operator vehicles, staff and visitors.
Noise	▪ Design of building with acoustic features, e.g. sound proofing. ▪ Appropriate orientation of building. ▪ Acoustic fencing. ▪ Hard landscaping, including soil bunds where appropriate. ▪ Fit silencers to plant and machinery. ▪ Use of 'Smart' reversing bleepers. ▪ Careful positioning of components within enclosed building.
Dust	▪ Dust suppression integral to operational procedures. ▪ Operational Management Practices. ▪ Hard landscaping, including soil bunds, where appropriate. ▪ Wheel Cleaning facilities. ▪ Negative pressure ventilation systems with biofilters.

Design Consideration	Mitigation Measure
Odour	▪ Odour suppression can be incorporated into dust suppression system. ▪ Use of biofilters to treat exhaust air. ▪ External odour suppression system e.g. deodorising sprays. ▪ Negative pressure ventilation systems with biofilters
Litter	▪ Internal design with storage bays. ▪ External litter fencing. ▪ Operational Management Practices.
Pests	▪ Vermin proof design. ▪ Drainage system to be fitted with grates. ▪ All ventilation and ducts should be fitted with bird cages. ▪ Rapid shutting doors. ▪ Operational Management Practices.
Water Protection	▪ Provision of sealed drainage system. ▪ Engineered containment. ▪ Separate collection of roof water. ▪ Recirculate water.

Incineration with Energy from Waste

Design Consideration	Mitigation Measure
Landscape	▪ Design of building and stack will depend on local context, but should take an appropriate form, massing, and size as well as use appropriate materials, colours and detailing to seek to enhance the local landscape where possible. ▪ Appropriate orientation and reprofiling of ground should be considered where appropriate. ▪ Tree and hedgerow planting. ▪ Appropriate design, positioning, and colour of fencing consistent with setting. ▪ Hard landscaping including soil bunds where appropriate.
Traffic/Access	▪ Design internal roads and operations for ease of access and vehicle routing and manoeuvring. ▪ Good access to site and facility including necessary visibility splays. ▪ Provision of adequate parking for operator vehicles, staff and visitors.
Noise	▪ Design of building with acoustic features, e.g. sound proofing. ▪ Appropriate orientation of building. ▪ Acoustic fencing. ▪ Hard landscaping, including soil bunds. ▪ Fit silencers to plant and machinery. ▪ Use of 'Smart' reversing bleepers.

Design Consideration	Mitigation Measure
Dust	▪ Dust suppression integral building and machinery. ▪ Operational Management Practices. ▪ Hard landscaping, including soil bunds. ▪ Wheel Cleaning facilities.
Odour	▪ Odour suppression can be incorporated into dust suppression system. ▪ External odour suppression system e.g. deodorising sprays. ▪ Operational Management Practices.
Litter	▪ Operational Management Practices. ▪ Use of automatic doors.
Pests	▪ Vermin proof design. ▪ Drainage system to be fitted with grates. ▪ All ventilation and ducts should be fitted with bird cages. ▪ Rapid shutting doors. ▪ Operational Management Practices.
Water Protection	▪ Provision of sealed drainage system. ▪ Engineered containment. ▪ Separate collection of roof water.

Appendix A: Relevant Guidance Documents

- Adopted West Sussex Structure Plan 2001-2016.
- Revised Deposit Draft West Sussex Waste Local Plan.
- West Sussex Minerals and Waste Development Scheme, April 2006.
- Adopted West Sussex Statement of Community Involvement, March 2006.
- West Sussex MWDF Sustainability Appraisal Scoping, November 2005.
- West Sussex Landscape Strategy and Character Assessment (WSCC).
- PPS1 Delivering Sustainable Development.
- PPS7 Sustainable Development in Rural Areas.
- PPS10 Planning for Sustainable Waste Management.
- PPS10 Companion Guide.
- PPS12 Local Development Frameworks.
- PPG13 Transport
- PPG15 Planning and the Historic Environment.
- PPG16 Archaeology and Planning.
- PPS22 Renewable Energy.
- PPS23 Planning and Pollution Control.
- PPG24 Planning and Noise.
- RPG9 including proposed changes to Chapter 10 (Waste).
- Draft South East Plan.
- Local Plan Policies – where relevant.
- Joint Material Resource Management Strategy and Contract.
- ODPM/Enviros Consulting report – Planning for Waste Management Facilities – A Research Study.
- Relevant Waste and Related Legislation – Waste Management Licensing Regulations; Landfill Regulations; Pollution Prevention and Control Regulations; Renewables Obligation Order.
- Relevant design guidance on industrial buildings.
- DEFRA Waste Implementation Programme: New Technologies.
- By Design (DETR/CABE, 2000).
- Building Regulations.
- Secured by Design.
- Town and Country Planning (Environmental Impact Assessment) (England and Wales) Regulations 1999.
- Circular 2/99: Environmental Impact Assessment.
- Circular 01/06: Guidance on Changes to the Development Control System.

Appendix B: Credits

- Design and Access Statements - how to write, read, and use them (Commission for Architecture and the Built Environment (CABE) 2006).
- The Design Principles: Preliminarily Approved Version, July 2006 (The West Sussex Design Commission, 2006).
- RGN3 – Regulatory Guidance Note 3, Environment Agency.
- Waste Strategy 2000 and Review of England's waste strategy 2006.

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