The Meaford Energy (Gas Fired Power Station) Order

6.2.15 Volume 2: Environmental Statement
Chapter 15: Waste


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Chapter Fifteen ♦ Waste

INTRODUCTION

15.1 The generation of waste (identified in the EU Waste Framework Directive (WFD) 2008 as “any substance or object which the holder discards or intends or is required to discard” in one form or another is an inevitable consequence of all forms of development and the sustainable management of waste is an important consideration. The purpose of this Chapter is to provide an assessment of the likely quantities of waste material created as a result of the Scheme to identify how it can be managed and assess the effects of this waste material on the environment.

15.2 The WFD requires member states to take appropriate measures to encourage, firstly the prevention or reduction of waste production and its harmfulness and secondly the recovery of waste by means of recycling, re-use or reclamation or any other process with a view to extracting secondary raw materials, or the use of waste as a source of energy.

15.3 Article 4 of the WFD sets out five steps for dealing with waste, ranked according to environmental impact - the ‘Waste Hierarchy’. Prevention, which offers the best outcomes for the environment, is at the top of the priority order, followed by preparing for re-use, recycling, other recovery and disposal, in descending order of environmental preference.

15.4 The waste hierarchy was transposed into UK law through The Waste (England and Wales) Regulations 2011. Whilst the regulations came into force on 29 March 2011, the provisions relating to the waste hierarchy (set out at in Regulations 12, 15 and 35) came into force on 28 September 2011.

15.5 Reducing the amount of material leaving the Scheme as a waste is a priority, both in terms of managing the material through the principles of the waste hierarchy given below in Figure 15.1 below (taken from Defra (2011) Guidance on applying the waste hierarchy), whilst minimising the number of vehicle movements at the Site and the associated effects increased traffic could have on the local environment.

15.6 The Waste Hierarchy places waste prevention as the priority in terms of how waste should be managed, followed by reuse, recycling and other forms of recovery, disposal to landfill or incineration without energy recovery are considered the least favourable solutions.
15.7 Chapter 7 of this ES specifically assesses the transport and traffic effects of the proposed Scheme, including the effect that additional vehicle movements to transport waste could have.

15.8 This chapter considers the types and quantities of waste (both solid and liquid), that will be generated during excavation, construction, operation and decommissioning of the Scheme and the likely significant environmental effects that might arise from the quantity of waste requiring offsite treatment or disposal to landfill (this being a finite resource and the least preferred waste management option under the waste hierarchy).

15.9 Foul waste water is not assessed within this chapter, it is assessed within Chapter 14 (Water Environment) of this ES.

**Key policies and guidance**

15.10 The following policies and guidance have been taken into account when assessing the effect of waste production from the excavation, construction and operation of the Scheme.

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15.11 As stated above, the WFD was implemented in England and Wales through the Waste (England and Wales) Regulations 2011. These regulations outline the requirement for collection, transport, recovery and disposal of waste. They also set out the principles of the Waste Hierarchy which should be considered when treating and handling waste. The Waste (England and Wales) (Amendment) Regulations 2012 came into force on 1 October 2012 and relate to the need to separately collect dry recyclate waste.

15.12 The Government Review of Waste Policy in England (2011) aims towards a “Zero Waste” and “Green Economy”. Targets for municipal waste are in line with those set by the European Union and there is a requirement to recover 70% of construction and demolition waste by 2020.

15.13 The recently published National Planning Policy for Waste (2014)\(^2\) is the formal replacement for Planning Policy Statement 10 (PPS10). It does however still follow the principles set out in the superseded PPS10 – which states that waste should be managed in line with the principles of the Waste Hierarchy.

15.14 The Staffordshire and Stoke-on-Trent Joint Waste Core Strategy 2010-2026 outlines the following policies which apply to the Scheme:

- Policy 1.3 Construction, demolition and excavation waste (CDEW): Recycling of CDEW and the diversion of inert waste to quarries requiring backfill for restoration purposes to be favoured over new inert landfill/landraising proposals.

- Policy 1.4 Use of waste for landscaping, screening, engineering purposes or of the improvement of agricultural or forestry land: Where inert waste is to be used for screening or engineering purposes to enable non waste development to proceed the following should be demonstrated:
  - The nature and extent of landscaping and screening is reasonable and necessary;
  - The amount of waste proposed to be deposited is the minimum necessary for the intended purpose;
  - It will not undermine the provision of waste management facilities operating further up the waste hierarchy;
  - It will not undermine the restoration of quarries that require inert materials for restoration purposes;
  - Demonstrate that flood risk will not be increased and surface runoff will be managed safely; and

15.15 The Waste Core Strategy makes provision for waste management requirements for the period to 2026 and therefore does not make provision for facilities during the proposed decommissioning phase of the Scheme.

15.16 The Staffordshire County Council Annual Monitoring Report (AMR) 2012/13, provides an update on the available capacity of facilities within the County to manage waste arisings.

15.17 The Staffordshire Waste Partnership’s 2013 Refresh of the Joint Municipal Waste Management Strategy for Staffordshire and Stoke-on-Trent [2007-2020] considers the waste arisings for municipal, construction, demolition, commercial and industrial waste. It provides a description of the municipal waste growth expected for Staffordshire and Stoke-on-Trent, with overall waste arisings to increase by approximately 4%, whereas collected residual waste is anticipated to decrease by circa 25,000 tonnes and collected recycling to increase by approximately 50,000 tonnes by 2027. However the growth for the largest component in the waste stream CDEW, is not assessed.

15.18 The Site Waste Management Plan Regulations 2008 were revoked in December 2013, as part of the Government’s Red Tape Challenge. This removed the requirement for large scale projects to have a site waste management plan (SWMP). However their production is still considered best practice.

15.19 The overarching National Policy Statement for Energy (EN-1) also states within paragraph 5.14 that, for energy infrastructure, arrangements should be made for the management of waste produced from the scheme through the preparation of a SWMP.

15.20 Therefore, a SWMP has been produced (appended at 15.2) and will be updated through the construction process.

**Assessment of a realistic worst case**

15.21 In respect of waste, the realistic worst case scenario from within the Scheme parameters (which are described in Chapter 4 of this ES) is the maximum footprint of the scheme and therefore maximum generation of material during excavation and construction. This chapter therefore assesses the 2+1 Power Station Complex arrangement with two Stacks and the largest building dimensions as presented in Chapter 4.
15.22 The assessment also includes the worst case scenario for green waste removal, which assumes clearance of the entire area within the Order Limits (166,000m²). In reality the Scheme will not be removing all vegetation from within the Order Limits but will be implementing a tree protection plan to preserve individual trees and tree groups on site (further detail in Chapter 10, Landscape and Visual Impact Assessment).

**ASSESSMENT METHODOLOGY**

15.23 In assessing the nature and effects of the likely quantities of waste material created as a result of the Scheme, the following assumptions have been made:

- Uncontaminated excavated material arising during construction will be considered for reuse on-site, with the contaminated material either treated on Site or removed off-Site for treatment/disposal;

- Where materials are available and suitable for reuse, measures will be taken to incorporate this material within the construction process as detailed in the CEMP; and

- Where figures are not available for the calculation of waste arisings, assumptions will be made based on previous similar projects.

15.24 The quantity of waste arisings has been assessed cumulatively with existing and predicted waste arisings, and has considered existing waste management infrastructure in the Staffordshire and Stoke-on-Trent area, to determine if a significant effect is anticipated.

15.25 The SWMP (Appendix 15.2) is a live document and should be updated to record materials on-site and those requiring off-site treatment through the course of the development of the scheme. It is considered that the assumptions made in this report provide a worst case scenario for the purpose of this assessment. Once the ground investigation has been completed, the information regarding contamination can be updated in the SWMP.

15.26 Details of the assumptions used in calculating the anticipated waste quantities that will be generated are provided in Appendix 15.1.

**Study area**

15.27 The study area for the waste assessment is two-fold. With regard to waste arisings, the Order Limits for the Application have been used.

15.28 However, waste is managed on a sub-regional and regional level, the baseline section and subsequent assessment therefore considers the availability of facilities to manage the waste produced at a sub-regional level. The latest published data relates to existing levels of CDEW and commercial and industrial (C&I) waste generation at a county level.
Data sources

15.29 Data is not available to establish the waste currently generated by the Site. However, there is a vehicle workshop on the MEC Site at present that has been assumed to generate a nominal level of waste. Therefore the levels of waste produced are expected to be negligible. In order to establish a baseline against which to compare likely quantities of waste material created by the MEC, a worst case scenario has been taken and the assumption has been made that no waste is generated at the MEC Site at present.

15.30 A desktop study has been undertaken and further detail is available in Chapter 13. Relevant details have been included in this chapter where required to inform the assessment of waste.

15.31 The level of contamination at the MEC Site will be investigated through a ground investigation which will take place post submission of the Application, as agreed through consultation (20th March 2014) with the Environment Agency Planning Officer (John Dingley).

15.32 Data for the current waste arisings from Staffordshire and Stoke-on-Trent have been gathered from the West Midlands Landfill Capacity Study 2009 (update) and the Staffordshire and Stoke-on-Trent Annual Monitoring Reports 2011 and 2012/2013.

Significance criteria

15.33 The significance criteria used to assess the effects of the Scheme have been developed by Atkins specifically for the purposes of the waste assessment and are based on professional judgement and experience on previous similar projects and detailed in Table 15.1 below. Those effects indicated as being of ‘major adverse’ and ‘moderate adverse’ are considered as significant.

Table 15.1: Significance criteria used to assess the impact of the Scheme on waste

<table>
<thead>
<tr>
<th>Significance of effect</th>
<th>Assessment criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Major adverse effect</td>
<td>Severe permanent reduction in landfill void space capacity on a local and regional scale. Need for large scale waste treatment facilities to protect against adverse environmental effects.</td>
</tr>
<tr>
<td>Moderate adverse effect</td>
<td>Slight or moderate, local-scale reduction in landfill void space capacity. Need for medium scale waste treatment facilities to protect against adverse environmental effects.</td>
</tr>
<tr>
<td>Minor adverse effect</td>
<td>Slight or moderate, local-scale reduction in landfill void space capacity reversible with time. Need for small scale waste treatment facilities to protect against adverse environmental effects.</td>
</tr>
<tr>
<td>Neutral effect</td>
<td>No waste generation, no discernible effects due to waste management.</td>
</tr>
</tbody>
</table>
Significance of effect | Assessment criteria
--- | ---
Minor beneficial effect | Minor decrease in waste generation or minor increase in re-use and recycling levels. Slight or moderate, local-scale reduction in use of landfill.
Moderate beneficial effect | Slight or moderate decrease in waste generation or moderate increase in reuse and recycling levels. Slight or moderate reduction in use of landfill.
Major beneficial Effect | Significant decrease in waste generation, landfill disposal or major increase in recycling and reuse levels.

Consultation

15.34 Consultation has been undertaken with the Senior Planning Officer (Andy Christelow) at Staffordshire County Council. A response was received on 3rd September 2014 (via email), which stated that the Council agreed with the proposed scope as set out in the Scoping Opinion.

15.35 The Scoping Opinion identified that this Chapter should include the following:

Table 15.2: EIA Scoping opinion relating to waste

<table>
<thead>
<tr>
<th>Scoping Opinion Requirement</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>The extent of the study area should be explained</td>
<td>This is further explained in paragraphs 15.27-15.28.</td>
</tr>
<tr>
<td>Operational requirements including the main characteristics of the production processes and the nature and quantity of materials used, as well as waste arisings and their disposal.</td>
<td>Outlined in paragraphs starting from paragraph 15.53 (Potential Effects).</td>
</tr>
<tr>
<td>The environmental effects of all wastes to be processed and removed from the site should be addressed. The ES will need to identify and describe the control processes and mitigation procedures for storing and transporting waste off site. All waste types should be quantified and classified.</td>
<td>All phases of the development of the Scheme have been assessed (excavation/enabling works, construction, operations and decommissioning) with regards to the potential effects, appropriate mitigation and residual effects.</td>
</tr>
<tr>
<td>The SoS advises that the ES should clarify the types of all wastes to be processed and that the effect of the proposal, in terms of waste, should be included in the ES.</td>
<td>All waste arisings expected from the development of the Scheme have been quantified in terms of the potential effects on local recycling capacity.</td>
</tr>
<tr>
<td>The applicant’s attention is drawn to paragraph 5.14.6 of the National Policy Statement EN-1 which outlines the requirement for a Site Waste Management Plan.</td>
<td>To be submitted alongside the ES and updated through the construction process.</td>
</tr>
</tbody>
</table>
### Scoping Opinion Requirement

<table>
<thead>
<tr>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>A focus which ensures that public health is given adequate consideration.</td>
</tr>
<tr>
<td>The assessment confirms that all waste will be managed via appropriately licensed facilities which will manage the potential risks to public health. The on-site reuse of materials will reduce vehicle movements—again reducing the risk to public health.</td>
</tr>
<tr>
<td>Compliance with the requirements of National Policy Statements and relevant guidance and standards should also be highlighted.</td>
</tr>
<tr>
<td>The policies outlined in paragraphs 15.10-15.20 have been identified as the most appropriate in relation to waste management for the development. Mitigation measures including reuse are to be used in line with the policy position.</td>
</tr>
<tr>
<td>Relevant areas outlined in the Government’s Good Practice Guide for EIA include: Effects associated with reuse of soils and waste soils, for example, reuse of site-sourced materials on-site or offsite, disposal of site-sourced materials offsite, importation of materials to the site, etc.</td>
</tr>
<tr>
<td>The reuse of materials on Site will be utilised where possible, outlined in paragraphs from 15.92 (mitigation measures).</td>
</tr>
<tr>
<td>Liaison with other stakeholders, comments should be sought from the Environment Agency for matters relating to waste characterisation and acceptance.</td>
</tr>
<tr>
<td>Consultation has been carried out with Staffordshire County Council details of which are provided in paragraph 15.34.</td>
</tr>
<tr>
<td>Description of the likely significant effects of the development on the environment, which should cover the direct effects and any indirect, secondary, cumulative, short, medium and long-term, permanent and temporary, positive and negative effects of the development, resulting from: the emission of pollutants, the creation of nuisances and the elimination of waste,</td>
</tr>
<tr>
<td>The assessment undertaken outlines the likely significant effects on the environment in relation to the waste generated by the proposed Scheme.</td>
</tr>
</tbody>
</table>

15.36 Through the Section 42 consultation, the Rivers and Canal Trust have commented that the methodology identified appears appropriate and the production of a SWMP should ensure that any risks are appropriately dealt with. The SWMP should consider potential risks to the Trent and Mersey Canal and identify measures to minimise such risks if required. Chapter 14 highlights how material will be managed to prevent any contaminants polluting the surface water courses.

**Cumulative developments**

15.37 Cumulative effects associated with waste generated by the Scheme relate primarily to the construction phase of the MEC. Operational waste generation from the Scheme will be low due to the nature of the development and therefore is unlikely to cumulatively impact significantly on local available capacity. Waste will be generated from general maintenance during the day to day operations of the
equipment and then subsequent shutdowns as required – likely to be once a year/once every two years). With regard to the cumulative assessment scenarios discussed in Chapter 5, scenario C4 (the Scheme being constructed with road improvements in operation 30,000 m² of MBP operation and 10,000 m² of MBP being constructed in a given year) presents the worst case scenario with the largest potential waste generation, as this is where construction of the MEC overlaps with construction and operation of MBP. This worst case scenario is used in the cumulative assessment detailed later in this Chapter.

**Inherent mitigation**

15.38 The location of the Scheme has been sited away from areas where construction of the Scheme could potentially disturb historic waste material, such as waste pulverised fuel ash (PFA) material deposited in the former slurry lagoons located to the east of the Site and an identified asbestos disposal area located to the western area of the Site (Figure 13.1, Ground Conditions).

15.39 Mitigation measures which aim to minimise the effect of waste arisings on the environment are identified later within this Chapter.

**Difficulties encountered compiling information**

15.40 The Scheme is not yet in detailed design phase, and as such there is no detailed waste quantities and waste type information available. The EIA therefore has considered development parameters under the ‘Rochdale Envelope’ (worst case) principles.

15.41 During the construction phase, more information will become available and the assumed waste quantities can be updated. However a conservative assumption has been made in regard to anticipated waste quantities to ensure a robust assessment is conducted. A ground investigation will be undertaken following submission of the Application, although a desktop study has been undertaken, details of which are in Chapter 13 – Ground Conditions. Relevant details of this desktop study have been considered in this assessment.

**BASELINE INFORMATION**

15.42 As explained in Chapter 1, MBP is the site of two former coal-fired power stations, Meaford A & B. The Power Station Complex is proposed to be located on the former Meaford B site. Whilst the majority of the above ground structures for the Meaford A & B power stations have been demolished, there are a number of remaining surface and below ground structures that will need to be managed as part of the Scheme.

15.43 At present exact details on the type and quantity of material that will require management is not yet known, with the exact levels of contamination not yet known until the ground investigation is undertaken.
15.44 There are a number of contamination sources identified by the desk study and previous investigations (details of these investigations are in Chapter 13 – Ground conditions). The presence of coal and PFA deposits from the operation of the Meaford ‘A’ and ‘B’ power stations, buried asbestos-containing materials (ACMs), spillages of fuels and chemicals resulting from the maintenance, operation and demolition of the former Meaford ‘A’ and ‘B’ power stations on Site. Contamination associated with the West Coast Main Line, made ground associated with infilling of the old quarry and the Trent and Mersey Canal, and PFA lagoons which were previously licensed landfills have also being identified.

15.45 There is a vehicle workshop on the MEC Site at present that has been assumed to generate a nominal level of waste. Any waste generated by the Scheme will therefore be an increase in relation to the current baseline.

15.46 In general waste is managed at a county, regional or sub-regional level depending on the waste type and availability of facilities. The baseline position presented in this Chapter represents the most recently available published data concerning waste arisings at a county and regional level. Historically, local authorities have not been required to report on data pertaining to CDEW and so only limited information is available.

15.47 The latest available data shows that the total volume of CDEW and C&I waste arisings produced in Staffordshire and Stoke-on-Trent in 2010/11 was 1,839,000 tonnes per annum (tpa) and 1,614,000 tpa respectively. The total CDEW figures for the wider West Midlands area was 9,066,083 tpa, as set out in the 2012/13 AMR, over the same period. The Staffordshire and Stoke-on-Trent area therefore contributed 20% to this amount.

15.48 Commercial and Industrial (C&I) waste can vary greatly in composition and therefore it is managed at a wide range of facilities. The waste is often similar in composition to municipal solid waste (MSW) and facilities often treat both waste streams together and so the assessment considers the effects on local residual treatment capacity (both C&I and MSW).

15.49 The total available capacity in Staffordshire and Stoke-on-Trent for recycling and aggregate recycling is 1,424,663 tpa and 967,940 tpa respectively, with landfill capacity of circa 15.5 million cubic metres. In terms of organic waste treatment facility capacity in Staffordshire and Stoke-on-Trent in 2011, there was 562,379 tpa available capacity.

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4 The Environment Agency Landfill Inputs and Capacity Report presented data in cubic metres, therefore the following density conversion figures were used. Hazardous waste: 0.87, Non-hazardous waste: 0.87 and Inert: 1.24
15.50 The equipment required for the Scheme will produce little/negligible waste being transported in units and assembled onsite or prefabricated sections. Therefore, if there is any waste produced as part of the equipment being brought onto site, this may include packaging, likely to be wood, which can be recycled offsite and will not require disposal.

15.51 The buildings will be steel portal framed (gas and steam turbine buildings). The turbines and Stacks are likely to be prefabricated prior to being brought onto site, although it is likely that they were be delivered in units and assembled onsite. The administrative building will also be a prefabricated.

15.52 Waste arisings for the Scheme have been calculated based on the following activities:

- waste generated during excavation and other construction preparatory works;
- waste generated from the materials brought onto site for construction; and
- waste generated during operation.

POTENTIAL EFFECTS

Excavation

15.53 The development of the Scheme will require clearance of the MEC Site for the construction of the Power Station Complex and the Integral gas connection route, including existing stockpiles of soil and rubble associated with the breaking up of the surface structures which remain on the MEC Site following the demolition of the former Meaford ‘A’ & ‘B’ power stations.

15.54 The development of the Scheme will also require vegetation clearance and excavation of areas to allow for the construction of piles, foundations, floor slabs and other integral infrastructure including the laying of underground pipes, cables and drainage.

15.55 At present, precise areas/quantities for these areas are not available, so the following worst-case assumptions have been made.

- The Power Station Complex site and internal roadway cover an area of 32,000m².
- The area for the Power Station Complex site will be excavated to a depth of 1m (see Appendix 15.1 for further detail on the assumptions used). Existing concrete from the previous Meaford ‘B’ power station will be excavated and segregated for crushing on-site. It is expected that 100% of the existing concrete will require excavation, although this will be updated in the SWMP once the enabling works/excavation begins and further details are known. The reuse rate for the concrete being excavated is estimated to be 95%. This assumption is based on
previous similar projects (once details from the ground investigation are known, the SWMP can be updated and the assumptions replaced for the actual data).

- The two temporary construction laydown areas (as shown on the Works Plan) proposed for the construction period occupy areas of 17,000m² for the northern (Works package 5B) and 6,000m² for the southern area (Works package 5A) of the MEC Site.

15.56 Underground Electrical Connection cables will be run directly from the adjacent existing Barlaston Substation in trenches, approximately 1m deep by 1m wide. Following laying of the Electrical Connection cables, the trenches will be backfilled and compacted. Given the proximity of the Power Station Complex and existing substation, it is estimated that the two connections will each be less than 100m in length.

15.57 As described in Chapter 4, the Gas Connection route would be 900m in length, with 740m being underground, and a 160m section running overground which is supported by pre-fabricated concrete bases. An open trench will be excavated to accommodate the underground section (1.5m deep and 1m wide).

15.58 As confirmed in Chapter 13 of this ES (Ground Conditions) and agreed with the EA and Staffordshire County Council, no detailed ground investigation has yet been undertaken and therefore actual figures for contaminated material are currently unknown. A conservative estimate based on the desk top assessment, professional experience and judgement is that 10% of all excavated material will be contaminated and therefore unsuitable for reuse on or off-Site and will require disposal at an appropriately licensed facility. As detailed and confirmed in the SWMP, further site investigation will be undertaken prior to development of the Scheme which will identify the exact type of material present and enable the levels of contaminated material to be assessed and allow the reuse rates in the SWMP for contaminated material to be adjusted based on the actual MEC Site conditions.

15.59 Some of the material might contain contaminants that result in the waste being classified as hazardous. This waste will require management at a hazardous waste facility. The county/sub-region does not have any existing hazardous landfill, nor is there provision made for new facilities within the development plan for the Stafford Borough. Therefore this material will need to be transported to the nearest available licensed facility which may be out of the County.

15.60 Table 15.3 provides the excavation waste arisings expected to be produced as part of the Scheme. It also identifies where these materials are expected to be reused on Site and where treatment/disposal might be necessary.

15.61 The following table details the waste arisings expected as part of the enabling works (excavation in terms of waste arisings).
### Table 15.3: Estimated excavation waste arisings

<table>
<thead>
<tr>
<th>Waste type</th>
<th>Volume (m³)</th>
<th>Tonnage (t)</th>
<th>Reuse rate (%) **</th>
<th>Reuse on-site (t)</th>
<th>Reuse/Recycle (t)</th>
<th>Disposal (t)***</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inert soil and stones Power Station Complex site</td>
<td>17,000</td>
<td>21,250</td>
<td>90</td>
<td>19,125</td>
<td>0</td>
<td>2,125</td>
</tr>
<tr>
<td>Concrete</td>
<td>15,000</td>
<td>18,600</td>
<td>95</td>
<td>17,670</td>
<td>0</td>
<td>930</td>
</tr>
<tr>
<td>Green waste</td>
<td>16,600</td>
<td>6,640</td>
<td>100</td>
<td>0</td>
<td>6,640</td>
<td>0</td>
</tr>
<tr>
<td>Inert soil and stones electricity connection route*</td>
<td>100</td>
<td>125</td>
<td>90</td>
<td>112</td>
<td>0</td>
<td>13</td>
</tr>
<tr>
<td>Inert soil and stones gas connection route*</td>
<td>1,110</td>
<td>1,388</td>
<td>90</td>
<td>1,277</td>
<td>0</td>
<td>111</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>49,810</strong></td>
<td><strong>48,003</strong></td>
<td></td>
<td><strong>38,184</strong></td>
<td><strong>6,640</strong></td>
<td><strong>3,179</strong></td>
</tr>
</tbody>
</table>

*The volume of inert soil and stones for the gas connection route and electrical connection will be reused for both the infilling of this element, but also elsewhere onsite where required for infilling/landscaping.

**The reuse rate provided is the general rate applied to the waste materials being excavated during the excavation phase of the development. This rate does not necessarily reflect actual quantities reused for each element as this is dependant of the requirements for material. Where the same waste type from separate components requires one element to be 100% reused onsite due to the requirements of the project.

***Disposal will be assessed for the excavation phase as the residual amount of waste, which cannot be reused/recycled and will be assessed based on the worst case scenario, that the waste cannot be treated and will require disposal. However, the treatment of contaminated soil specifically will be a priority, prior to any disposal method.

15.62 During the enabling/excavation works for the Scheme the significant proportion of waste arisings will be produced from removal of contaminated soils resulting from previous site uses together with concrete which formed the foundations of the former Meaford B power station.

15.63 Total excavation waste arisings equate to 48,003 tonnes (41,363 tonnes of CDEW and 6,640 tonnes of green waste).

15.64 When compared to the aggregate recycling capacity in Staffordshire and Stoke-on-Trent the excavation waste arisings equate to 1.7% of the total aggregate capacity per annum, thus having a minor adverse effect on the local recycling capacity.

15.65 A recycling rate of 100% has been applied to the green waste produced as it will be recycled off-site.
When compared to the organic recycling capacity in Staffordshire and Stoke-on-Trent (562,379 tpa) the generated green waste arisings equate to 1.2% of the total aggregate capacity per annum, thus having a neutral effect on the local recycling capacity.

The enabling/excavation period will be approximately ten months in duration, with a maximum of 100 workers present at any one time. Table 15.4 shows the expected C&I waste arisings that would be produced by the workers onsite.

The workers’ waste was calculated based on the assumption that each worker onsite would produce 0.031 tonnes per month (based on WRAP’ food and drink waste for the UK)\(^6\). Given its similarity to municipal waste, 60% of operational waste (C&I waste) produced by the staff onsite will be recycled offsite with 40% requiring treatment off-site.

<table>
<thead>
<tr>
<th>Phase</th>
<th>Tonnage</th>
<th>Recycling offsite (t)</th>
<th>Treatment offsite (t)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Excavation</td>
<td>31</td>
<td>18.6</td>
<td>12.4</td>
</tr>
</tbody>
</table>

When compared to the residual treatment capacity in Staffordshire and Stoke-on-Trent (1,614,000tpa) the scheme will produce 0.002% of the total produced per annum, having a neutral effect on the local recycling/treatment capacity (Table 15.5).

<table>
<thead>
<tr>
<th>Stage</th>
<th>Waste arisings</th>
<th>Significance of effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Excavation</td>
<td>48,034</td>
<td>Minor adverse effect</td>
</tr>
</tbody>
</table>

Construction

15.71 In order to estimate the amount of material that will become waste, either through materials brought on Site and not used or waste arising from the construction activities (including packaging), a standard wastage rate for each material type based on the BRE Green Guide to Specification is applied (explained further in the accompanying Appendix 15.2).

15.72 The design and construction of the Scheme will seek to ensure that wastage of construction materials is minimised, with efforts made to maximise on-site reuse and off-site recycling and recovery of any waste generated.

15.73 Wood and plastic packaging waste is likely to be generated during the delivery of equipment for the Power Station Complex components. As discussed with Staffordshire County Council and the Environment Agency, once details of these waste streams are known they will be updated in the SWMP. Material which will be removed from Site will be reused or recycled wherever possible.

15.74 Importation of soil will be required in lieu of material removed from the MEC Site due to contamination or for landscaping purposes. In line with the BRE’s Green Guide to Specification a 3% wastage rate has been applied to imported soils.

15.75 The area of the Power Station Complex site excluding the internal roads (23,850m$^2$), will be concreted to a depth of 0.5m. A wastage rate of 2.5% has been applied to the imported concrete (based on BRE’s Green Guide).

15.76 A tarmac access road to the Site (Work Package 4 on the Works Plan) together with two internal roads within the Power Station Complex will be provided, covering an area of 8,150m$^2$ with bitumen laid to a depth of 0.25m. A wastage rate of 4.9% will be applied to the imported bitumen in line with BRE’s wastage rates. The waste arisings from the imported bitumen and concrete will be recycled off site.

15.77 The Northern Access Road to the MEC Site which measures 770m by 7m (worst case width will require resurfacing works. It is expected that by upgrading rather than constructing a new access road will mean that material use can be reduced by 90%. A 13% wastage rate has been applied to imported aggregate for the existing access road and 4.9% for imported bitumen, based on BRE’s rates. In addition, aggregate will be needed for the two temporary construction laydown areas, this will be laid to a depth of 0.3m.

15.78 Table 15.6 shows the expected construction waste arisings expected to be produced as part of the Scheme and where materials are expected to be reused onsite or recycled, reused or sent for disposal off-Site.

---

7 BRE’s Green Guide to Specification
### Table 15.6: Estimated construction waste arisings

<table>
<thead>
<tr>
<th>Waste type</th>
<th>Volume (m³)</th>
<th>Tonnage (t)</th>
<th>Wastage rate (%)</th>
<th>Wastage (t)</th>
<th>Reuse onsite (t)</th>
<th>Reuse offsite (t)</th>
<th>Recycle off-site (t)</th>
<th>Disposal offsite (t)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inert soil and stones power station complex site*</td>
<td>1,700</td>
<td>2,125</td>
<td>3</td>
<td>64</td>
<td>64</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Concrete</td>
<td>11,925</td>
<td>14,787</td>
<td>2.5</td>
<td>370</td>
<td>0</td>
<td>0</td>
<td>370</td>
<td>0</td>
</tr>
<tr>
<td>Bitumen</td>
<td>2,180</td>
<td>2,180</td>
<td>4.9</td>
<td>107</td>
<td>0</td>
<td>0</td>
<td>107</td>
<td>0</td>
</tr>
<tr>
<td>Aggregate**</td>
<td>6,900</td>
<td>10,833</td>
<td>13**</td>
<td>1,408</td>
<td>0</td>
<td>0</td>
<td>1,408</td>
<td>0</td>
</tr>
<tr>
<td>Total***</td>
<td>22,705</td>
<td>29,925</td>
<td>-</td>
<td>1,949</td>
<td>64</td>
<td>0</td>
<td>1,885</td>
<td>0</td>
</tr>
</tbody>
</table>

*The additional soil identified in the construction waste arisings, is required to be brought onto site due to the net loss of soil during the excavation period, due to contaminated soil.

**The volume of aggregate for reuse offsite has been calculated based on the refurbishment of the existing road and the material required for the temporary laydown areas, which will require 100% removal after construction is complete and reused offsite/recycled.

***At present information relating to internal processing equipment is not known, therefore the waste element of packaging that may be generated is unknown, which will contribute to an element of waste requiring offsite treatment.

15.79 The construction waste arisings equate to 1,949 tpa. When compared to the aggregate recycling capacity in Staffordshire and Stoke-on-Trent, the Scheme will produce 0.05% of the total capacity per annum, having a neutral effect on the local recycling/treatment capacity. When excavation (not including green waste) and construction waste arisings are considered together (43,312 tonnes), the Scheme will produce arisings which equate to 0.7% of the total aggregate recycling capacity per annum over the 36 months of excavation/enabling and construction phase, which equates to a minor adverse effect.

15.80 The main construction period will be 20 months, with a maximum of 600 workers present on Site throughout the construction period. Table 15.7 shows the expected C&I waste arisings which will be produced by the workers on the MEC Site, assuming a 60% recycling rate is applied.
Table 15.7: Estimated waste arisings produced per annum by staff during construction

<table>
<thead>
<tr>
<th>Phase</th>
<th>Tonnage (t)</th>
<th>Recycling offsite (t)</th>
<th>Treatment offsite (t)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Construction</td>
<td>223</td>
<td>133.8</td>
<td>89.2</td>
</tr>
</tbody>
</table>

15.81 C&I waste generation from workers equates to 223 tpa. When compared to the residual treatment capacity in Staffordshire and Stoke-on-Trent the Scheme will produce 0.01% of the total produced per annum, having a neutral effect on the local recycling/treatment capacity (Table 15.8).

Table 15.8: Significance of potential effects during the construction phase

<table>
<thead>
<tr>
<th>Stage</th>
<th>Waste arisings</th>
<th>Significance of effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Construction</td>
<td>2,172</td>
<td>Neutral effect</td>
</tr>
</tbody>
</table>

Operation

15.82 During the operational phase of the Power Station Complex there will be a small element of operational waste produced including waste arisings from workers on Site and waste arisings produced during Power Station Complex maintenance.

15.83 In terms of the waste produced as part of the operational phase of the development, this is expected to compose used oil, filter cartridges, grounds maintenance and municipal waste.

15.84 The amount of waste produced as part of the maintenance and general day to day working of the Power Station Complex is difficult to determine, however the following figures in Table 15.9 indicate the potential waste produced per annum. The wastes which can be recycled include various oils from separators, timber and green waste, with fluorescent tubes, lead batteries and oil filters requiring disposal.

Table 15.9: Estimated operational waste arisings produced per annum on site during operation of the Meaford Energy Centre:

<table>
<thead>
<tr>
<th>Phase</th>
<th>Tonnage (t)</th>
<th>Recycling offsite (t)</th>
<th>Disposal (t)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commissioning (11 months)</td>
<td>34.1</td>
<td>20.5</td>
<td>13.6</td>
</tr>
<tr>
<td>Operational</td>
<td>9.8</td>
<td>8.8</td>
<td>0.7</td>
</tr>
<tr>
<td>Total</td>
<td>43.9</td>
<td>29.3</td>
<td>14.3</td>
</tr>
</tbody>
</table>
15.85 The operational waste arisings from the Power Station Complex itself equates to 43.9 tpa. When compared to the residual treatment capacity in Staffordshire and Stoke-on-Trent the Scheme will produce 0.003% of the total produced per annum, having a neutral effect on the local recycling/treatment capacity (Table 15.9).

15.86 Table 15.10 shows the expected C&I waste arisings which will be produced by the workers on Site during the operational phase of the Scheme. Operations are anticipated to last for a 35 year period (as described in Chapter 4 of this ES.

Table 15.10: Estimated mixed C&I waste arisings produced per annum by staff on site during operation of the Meaford Energy Centre:

<table>
<thead>
<tr>
<th>Phase</th>
<th>Tonnage (t)</th>
<th>Recycling offsite (t)</th>
<th>Treatment offsite (t)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operation</td>
<td>11.2</td>
<td>6.7</td>
<td>4.5</td>
</tr>
<tr>
<td>Total</td>
<td>11.2</td>
<td>6.7</td>
<td>4.5</td>
</tr>
</tbody>
</table>

15.87 The operational waste arisings from the workers equates to 11.2 tpa. When compared to the residual treatment capacity in Staffordshire and Stoke-on-Trent the Scheme will produce 0.0007% of the total produced per annum, having a neutral effect on the local recycling/treatment capacity (Table 15.11).

Table 15.11: Significance of potential effects during the operational phase

<table>
<thead>
<tr>
<th>Stage</th>
<th>Waste arisings</th>
<th>Significance of effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operation</td>
<td>55.1</td>
<td>Neutral effect</td>
</tr>
</tbody>
</table>

15.88 Occasional maintenance activities would generate minimal quantities of waste, these will be managed at an appropriately licensed facility.

Decommissioning

15.89 For the purposes of the assessment it is assumed that the Scheme would be decommissioned and demolished at the end of its operational life. The Waste Core Strategy makes provision for waste management requirements for the period to 2026, the decommissioning of the Scheme will occur after this time. Therefore assessment of effects of plant demolition against provided capacity cannot be made with any certainty. Also it is unclear what technology advancements may be made in the waste management industry in this intervening period.
15.90 Prior to the decommissioning phase, an assessment of the likely material types and quantities to be generated will need to be made, and a strategy to maximise the recycling of this material produced in consultation with Staffordshire County Council (including any successor waste collection authority as the case may be) and the Environment Agency, thereby seeking to minimise the effect on whatever treatment capacity is available at that time.

15.91 It is anticipated that levels of waste generated will be similar to those produced during the excavation and construction phase and therefore will have a neutral effect on local facility capacity.

MITIGATION MEASURES

Excavation

15.92 Excavated concrete will be crushed on the MEC Site and reused where possible to prepare the site platform for construction of the Power Station Complex.

15.93 Crushed concrete material will also be used in the temporary construction laydown areas (Work Packages 5A and 5B on the Works Plan); remaining in-situ to be used in part of the northern laydown area (Work Package 5B on the Works Plan) as it forms part of the proposed ecological mitigation.

15.94 Where excavated material is uncontaminated it will be reused across the area included within the Order Limits where required. The excavated material will also be utilised for the backfilling and compacting of excavated gas and electricity trenches. Excess excavated material from the gas and electrical connection route will be utilised elsewhere onsite where possible (within the Order Limits).

15.95 Hazardous materials will be treated on the MEC Site where possible, or will otherwise be removed off-Site for disposal/treatment in liaison with Staffordshire County Council. An appropriately licensed contractor will be responsible for dealing with the waste. Records of waste movement will be maintained on Site and in line with legislative requirements and the SWMP.

Construction

15.96 Where possible, the recycle/reuse of material on Site will be undertaken in accordance with key performance indicators identified in the SWMP. The reuse of material onsite will be used as the first option when assessing the destination of the material currently onsite.

15.97 Recycling containers will be provided to reduce residual waste produced through all phases of the Scheme’s development. All waste will be removed from Site by an appropriately licensed contractor and sent to recycling/treatment facilities as appropriate. To this end:
• segregation of materials on the MEC Site will enable the allocation of materials for reuse on the MEC Site and those requiring off-Site treatment (involving decontamination, recycling and recovery);

• encouraging the use of non-primary materials over primary materials will be sought where possible;

• consideration will be given to the use of renewable materials, materials with low(er) environmental effects and towards components with high(er) proportions of recycled material to be utilised where possible;

• contractors will maintain the SWMP to identify responsibilities, waste streams and plan for efficient materials and waste handling;

• consideration of a concrete batching plant being employed on the MEC Site would result in less waste being produced than if material is brought in ready mixed by lorries; and

• site materials will be quantified and categorised in order to identify options for recycling and reuse.

Operation

15.98 Segregating waste at source will increase the amount of waste available for recycling and reduce the amount of waste requiring offsite disposal. All waste will be removed from the MEC Site by an appropriately licensed contractor and sent to recycling/treatment facilities as appropriate.

15.99 Appropriate storage and regular removal of material offsite by a licensed waste carrier.

Decommissioning

15.100 Waste management is a rapidly evolving activity and it is unclear what technological advancements might be made in this intervening period. As such, consideration of mitigation measures cannot be made with any certainty.

15.101 Prior to decommissioning, an assessment of the likely material types and quantities to be generated would be made and mitigation measures made based on this information at the time.
RESIDUAL EFFECTS

Excavation

15.102 Following the application of mitigation measures, the waste requiring off-Site treatment/disposal (3,179 tonnes) equates to 0.13% of the local recycling/treatment capacity for aggregate available in Staffordshire and Stoke-on-Trent, hence having a neutral effect.

15.103 The waste arisings from workers equates to 12.4 tonnes per annum of C&I waste, when compared to the residual treatment capacity in Staffordshire and Stoke-on-Trent the Scheme will produce 0.0008% of the total produced per annum having a neutral effect on the local recycling/treatment capacity.

15.104 There are likely to be elements of hazardous waste which will require appropriate management. Given the lack of available facilities within the local area this could potentially result in a minor adverse effect (Table 15.12).

Table 15.12: Significance of potential residual effects during the excavation phase

<table>
<thead>
<tr>
<th>Stage</th>
<th>Waste arisings</th>
<th>Significance of effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Excavation</td>
<td>3,191.4</td>
<td>Minor adverse effect</td>
</tr>
</tbody>
</table>

Construction

15.105 Following implementation of the mitigation measures, there will be a residual amount of waste which will require disposal. When compared to the local recycling capacity for aggregate the waste requiring off-site treatment or disposal (0 tonnes) equates to 0% of that available in Staffordshire and Stoke-on-Trent per annum, having a neutral effect on the local recycling/treatment capacity.

15.106 The waste arisings from the workers onsite through the construction period equates to 89.2 tonnes of C&I waste per annum, when compared to the residual treatment capacity in Staffordshire and Stoke-on-Trent the scheme will produce 0.005% of the total produced per annum, having a neutral effect on the local recycling/treatment capacity (Table 15.13).

Table 15.13: Significance of potential residual effects during the construction phase

<table>
<thead>
<tr>
<th>Stage</th>
<th>Waste arisings</th>
<th>Significance of effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Construction</td>
<td>89.2</td>
<td>Neutral effect</td>
</tr>
</tbody>
</table>
Operation

15.107 Following implementation of the mitigation measures, the residual effects are expected to be neutral. When compared to the local recycling capacity for aggregate the waste requiring off-site recycling, treatment or disposal (14.3 tonnes) equates to 0.0006% of that available in Staffordshire and Stoke-on-Trent per annum, having a neutral effect on the local recycling/treatment capacity.

15.108 Following the application of the mitigation measures outlined above, the residual effects are expected to be neutral, with 4.5 tpa requiring off-Site treatment, equating to 0.0006% of the total local residual treatment capacity available per annum in Staffordshire and Stoke-on-Trent, having a neutral effect on the local recycling/treatment capacity.

15.109 Based on the operational waste to be produced the effect of the Scheme on the local recycling capacity is expected to be neutral (Table 15.14).

Table 15.14: Significance of potential residual effects during the operations phase

<table>
<thead>
<tr>
<th>Stage</th>
<th>Waste arisings</th>
<th>Significance of effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operation</td>
<td>18.8</td>
<td>Neutral effect</td>
</tr>
</tbody>
</table>

CUMULATIVE EFFECTS

15.110 Consideration of the proposed Scheme development scenarios outlined in paragraph 5.60 of Chapter 5 of this ES has been carried out and the worst case has been used to determine whether the combined effects of construction and operation of the Scheme and MBP developments might have an effect on the local recycling capacity.

15.111 With regard to waste generation, the worst case scenarios for cumulative effects relate to a scenario where construction overlaps with substantial development in the surrounding MBP (scenario C4), entailing the construction of the MEC and 10,000m² of employment floorspace with the road improvements and 30,000m² of employment floorspace occupied.

15.112 In such a situation waste arisings for the MEC and those produced by the developments outlined above will result in a cumulative total of 51,440 tonnes of CDEW being produced. When compared to the local recycling capacity for aggregate the waste requiring off-Site treatment/disposal, this cumulative total equates to 2.1% of that available in Staffordshire and Stoke-on-Trent, having a minor adverse effect on the local recycling/treatment capacity.
15.113 When the C&I waste is assessed for the operation of 30,000m² of employment floorspace in the MBP, a total of 2,551 tonnes of C&I will be produced. When compared to the residual treatment capacity in Staffordshire and Stoke-on-Trent, the Scheme will produce 0.2% of the total produced per annum, having a neutral effect on the local recycling/treatment capacity.

CONCLUSIONS

15.114 Table 15.15 below outlines the total waste arisings expected during the life of the Scheme and its operation and maintenance over a 35 year operational period, before and after the implementation of mitigation measures.

Table 15.15: Estimated total tonnages of waste produced before and after the mitigation measures outlined above are implemented

<table>
<thead>
<tr>
<th>Phase</th>
<th>Tonnage before Mitigation* (t)</th>
<th>Tonnage once Mitigation applied* (t)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Excavation</td>
<td>48,034</td>
<td>3,179</td>
</tr>
<tr>
<td>Construction</td>
<td>2,172</td>
<td>89.2</td>
</tr>
<tr>
<td>Operation</td>
<td>55.1</td>
<td>18.8</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>50,261</strong></td>
<td><strong>3,287</strong></td>
</tr>
</tbody>
</table>

*Including waste produced by workers on site

15.115 Based on the waste arisings predicted above, there will be a 93.5% decrease in the waste that requires off-Site disposal following mitigation.

15.116 Following the implementation of mitigation measures and adhering to best practice management methods, there will be a small amount of residual waste that requires disposal.

15.117 There are also likely to be elements of hazardous waste which will require appropriate management.

15.118 Prior to the implementation of proposed mitigation measures, it is predicted that a minor adverse effect would be experienced during the excavation and construction period. However, once the mitigation measures have been implemented, it is anticipated that the effects will be neutral (Table 15.16).

Table 15.16: Significance of potential residual effects throughout all phases

<table>
<thead>
<tr>
<th>Stage</th>
<th>Waste arisings</th>
<th>Significance of effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>All phases</td>
<td>3,287</td>
<td>Neutral effect</td>
</tr>
</tbody>
</table>
15.119 Following the implementation of the mitigation measures outlined above, it is anticipated that the operational phase will result in a neutral effect on local waste management operations.