

Phase 2 of the Impact Assessment of Proposals for a Revised IPPC Directive

Part 4: Specified Treatments of Non-hazardous Waste Final report

June 2008



Llywodraeth Cynulliad Cymru
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Executive Summary

Introduction

The Commission published its proposal and an impact assessment for a Directive on industrial emissions (Industrial Emissions Integrated Pollution Prevention and Control, IE(IPPC)D ¹) on 21st December 2007. This consolidates seven existing Directives related to industrial emissions into “a single clear and coherent legislative instrument” and includes a number of changes related to new and existing activities. The main objective of this report is to assess, in outline, the likely impacts of the proposal in relation to the waste management and waste recovery industries within the UK.

Proposed Changes

The changes discussed in this document are outlined in section 5.3 of Annex I of the proposed IE(IPPC)D. The table below compares these proposals with the original IPPC Directive (IPPCD) (amendments are highlighted in grey).

Original IPPCD	Proposed IE(IPPC)D
<p>5.3. Installations for the disposal of non-hazardous waste as defined in Annex II A to Directive 75/442/EEC under headings D8 and D9, with a capacity exceeding 50 tonnes per day involving the following activities:</p> <ul style="list-style-type: none"> (a) biological treatment (b) physico-chemical treatment 	<p>5.3 Disposal or recovery of non-hazardous waste as defined in Annex II A to Directive 75/442/EEC under headings D8 and D9, with a capacity exceeding 50 tonnes per day involving the following activities:</p> <ul style="list-style-type: none"> (a) biological treatment; (b) physico-chemical treatment; (c) pre-treatment of waste for co-incineration; (d) treatment of slags and ashes; (e) treatment of scrap metal.

The fundamental change proposed by IE(IPPC)D is to extend the scope of IPPC to include 'treatment for recovery' (above the relevant threshold) rather than just 'treatment for disposal'.

¹ “Proposal for a Directive of the European Parliament and of the Council on industrial emissions (integrated pollution prevention and control) (recast)”. European Commission, Brussels, 21st December 2007. Available from: <http://ec.europa.eu/environment/ippc/proposal.htm>

Scope and Impact of the Proposed Changes

The installations affected by the IE(IPPC)D proposals are facilities treating non-hazardous waste for recovery at installations with a capacity greater than 50 tonnes per day. These sites are not currently subject to IPPC through the Environmental Permitting Regulations (2007) (EPR-IPPC) Part A regulation, but are regulated under the following regimes:

Sub-sector	Present Regulatory Framework
Biological and physico-chemical treatment	Operations are covered by the Waste Framework Directive (WFD). Facilities in the UK are regulated either under an EPR-waste permit or an EPR-waste exemption.
Treatment of slags and ashes	EPR-IPPC Part B, BAT-based regulation for emission to air only.
Pre-treatment for co-incineration	Operations are covered by the WFD. Facilities in the UK are regulated either under an EPR-waste permit or an EPR-waste exemption.
Treatment of scrap metal	Operations are covered by the WFD. Facilities in the UK are regulated either under an EPR-waste permit or an EPR-waste exemption.

Number of Installations

The table below summarises the potential number of sites that could be affected by the IE(IPPC)D proposals for the disposal and recovery of non-hazardous wastes at a facility with a capacity greater than 50 tonnes per day.

Treatment for recovery activities > 50 tonnes per day		EPR IPPC Part B	EPR-waste	EPR-waste exemption
Water sector physico-chemical and biological treatment	Sewage STCs	0	50 - 75	425 - 500
	Water STCs	0	50 - 100	0
	STWs	0	0	0 ^[1]
Waste management sector biological treatment	Composting	0	25 - 50	125-150
	MBT with anaerobic digestion	0	25 - 50	No data
	Unspecified biological treatment	0	25 - 50	No data

Treatment for recovery activities > 50 tonnes per day		EPR IPPC Part B	EPR-waste	EPR-waste exemption
Waste management sector physico-chemical treatment	MRF	0	75 - 100	600
	Physical	0	300	No data
	Physico-chemical	0	75 - 100	No data
	Chemical	0	25	No data
Pre-treatment for co-incineration		Incorporated above under waste management sector biological treatment and physico-chemical treatment		
Treatment of slags and ashes		10-20	0	0
Treatment of scrap metal	Vehicle dismantlers (excluding ELV sites)	0	788	0
	WEEE facilities	0	5-10	0
	Metal recycling facilities	0	168	167
Totals (low estimate)		10	1611	2017^[2]
Totals (high estimate)		20	1816	2617^[2]

Note [1]: There are estimated to be an additional 700-1200 STWs that treat sludge from the main works that are listed in the EP Regulations as 'excluded waste' and therefore are not currently subject to regulatory control. For the purposes of this assessment, the impact of the proposed IE(IPPC)D changes on these installations have been assumed to be broadly similar to these for an EPR-waste exempt site.

Note [2]: The total figures include the estimated 700-1200 STWs detailed in Note [1].

Environmental Impacts

The main environmental issues for EPR-waste/exempt operations are highlighted within the IPPC Sector Guidance Note S5.06², which identifies issues for operators previously entering into the EPR-IPPC regime. In some cases, the scale of the environmental impacts of these affected installations is not likely to be as large as some existing Part A IPPC installations however the issues remain similar:

- Managing the risks associated with accidents and accidental pollutant releases;
- assessing the site's techniques and technologies against indicative Best Available Techniques (BAT);
- managing wastes in line with the waste hierarchy in order to maximise resource efficiency and minimise environmental pollution or damage;

² Sector Guidance Note IPPC S5.06 Guidance for the Recovery and Disposal of Hazardous and Non Hazardous Waste

- waste characterisation, sampling, monitoring and record-keeping;
- assessing, characterising and reporting upon discharges to air, land and water;
- odour assessment and appropriate management/reduction;
- site investigation and restoration (prevention of emissions to land)

Costs & Benefits

The main financial impact of the proposed changes will be the associated administrative costs to operators in applying for and complying with a Part A IPPC permit. It has been assumed that all costs associated with the regulatory burden of administering IPPC for new permitted installations will be recovered through the regulatory charging scheme.

Compliance Costs

There are likely to be greater financial burdens for operators currently under EPR-waste exemption as there are likely to be a wider range of compliance activities required than for those operators currently under EPR-waste permits.

The estimated non-recurring (including capital) cost could vary between approximately £4.6 million and £446 million on an annualised basis. The total recurring and non-recurring costs to UK industry from those operators affected by the proposed changes to Section 5.3 of Annex 1 of the IE(IPPC)D have been estimated to vary between approximately £14.6 million and £532 million per year.

The significant uncertainty in cost estimates, as indicated by this broad range, is due to the complexity of the comparison between the business as usual regulatory framework and the additional requirements of the proposed IE(IPPC)D, and the wide diversity of types of installations covered, leading to difficulties in defining the profile of additional compliance measures that might be required. In addition, there is significant uncertainty over the numbers of installations affected, as indicated later in this summary. Within the scope and timescales of this study, only limited investigations have been possible to explore these complex aspects.

Administrative Costs

The administrative costs of the regulatory authorities are assumed to be covered by the fees and charges levied. The wide range of costs represents uncertainties regarding the number of installations, costs of preparing a permit and the charges likely to be levied for the type of installation under the Environment Protection Operator Pollution Risk Appraisal (EP-OPRA) scheme.

The estimated non-recurring (including capital) cost could vary between approximately £4.5 million and £53 million on an annualised basis. The total recurring and non-recurring administrative costs to UK industry from those operators affected by the proposed changes to Section 5.3 of Annex 1 of the IE(IPPC)D have been estimated to vary between approximately £6.9 million and £55.8 million per year.

Benefits

The application of IPPC requirements to the installations that may be affected by a change to the IPPC Directive with the inclusion of non-hazardous waste treatment for recovery could potentially lead to improvements in resource efficiency, reductions in fugitive emissions, including odour, reductions in leakages of materials to soil and water and other environmental benefits. However due to the absence of available data within the scope and timescales of this study, it has not possible to quantify these potential benefits

Limitations/Uncertainties

Many of the sources of information used to identify the number of installations potentially affected by the IE(IPPC) proposals, such as the Environment Agency Regis database or data from trade associations, do not categorise sites according to daily treatment capacity. For example, EPR-waste exemptions are based on a threshold for annual throughput. Although this can be converted to a daily throughput, this is not directly equivalent to treatment capacity because averaging throughput over the year is likely to underestimate the number of sites with high capacity but relatively low throughput.

Other sources of data can only provide information on the total number of a particular type of treatment site in the UK with no quantitative data on capacity or throughput being available.

Further uncertainty is caused by the complexity of the comparison between the business as usual regulatory framework and the additional requirements of the proposed IE(IPPC)D, and the wide diversity of types of installations covered, leading to difficulties in defining the profile of additional compliance measures that might be required.

The effect of this is that estimations of numbers of installations and likely costs have been made in ranges. These ranges represent best estimates based on the limitation of available data within the scope and timescales of this study.

It is a recommendation of this report that additional data is sought by the UK Government, notably in order to examine and quantify the environmental benefits of the proposed IE(IPPC)D for sectors covered by this report and to reduce the uncertainties associated with quantification of the compliance costs and numbers of affected installations.

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1. Introduction

1.1 This Report

The overall aim of this work package is to provide support to Defra in response to the publication of the European Commission's proposal for a new Directive on industrial emissions. This work has been undertaken under Entec's framework contract with Defra on "*The Preparation of Regulatory Environmental Impact Assessments in Relation to Proposals for Air Quality Legislation*". The main objective of this report is to assess the likely impacts of the proposal in relation to disposal or recovery of non-hazardous waste within the UK at installations with a capacity exceeding 50 tonnes per day. In particular, this report focuses on the proposed extension of Integrated Pollution Prevention and Control (IPPC) from just disposal activities to include recovery of non-hazardous wastes. The report also considers the proposed extension of IPPC to include the following new activities:

- Pre-treatment of waste for co-incineration;
- Treatment of slags and ashes;
- Treatment of scrap metal.

The project team has consulted with the following stakeholders to support the development of this report:

- Regulators - Environment Agency for England & Wales;
- Industry associations - Water UK and British Metal Recycling Association (BMRA);
- Installations in the waste management and water sectors involved in the recovery of waste from biological or physico-chemical activities with 3 responses received from waste management companies and a further 5 from water companies. In addition the following were contacted:
 - Installations involved in the treatment of slag and ashes – 5 responses received
 - Installations involved in the treatment of scrap metal – 1 response received
 - Installations involved in the pre-treatment of waste for co-incineration – 2 responses received
- Other stakeholders – National Industrial Symbiosis Programme (NISP)

1.2 What Is The Issue?

1.2.1 Overview of Proposed Revised IPPC Directive

The Commission published its proposal and an impact assessment for a Directive on industrial emissions (Industrial Emissions Integrated Pollution Prevention and Control, henceforth cited as “IE(IPPC)D”³) on 21st December 2007. This consolidates seven existing Directives related to industrial emissions into “a single clear and coherent legislative instrument”. These existing Directives include titanium dioxide industry related directives (78/176/EEC, 82/883/EEC, 92/112/EEC), the IPPC Directive (2008/01/EC), the Solvent Emissions Directive (1999/13/EC), the Waste Incineration Directive (2000/76/EC) and the Large Combustion Plants (LCP) Directive (2001/80/EC). The Commission’s Impact Assessment (IA)⁴ identified a number of problems related “(1) to shortcomings in the current legislation that lead to unsatisfactory implementation and difficulties in Community enforcement actions and, thereby, to loss of health and environmental benefits and (2) to the complexity and lack of coherence of parts of the current legal framework.”

The Commission has provided an indicative timeline for discussion and implementation of the proposals. It is important to note that this is dependent on the length of time it will take to discuss and agree the proposed directive within the co-decision procedure. The initial timetable is set out below in Table 1.1

Table 1.1 Key dates for the discussion and implementation of the proposed IE(IPPC)D

Date	Description
12/2007	The Commission adopts its proposal for a Directive on industrial emissions as well as issuing its Communication ‘Towards an improved policy on industrial emissions’
01/2009	First reading in the European Parliament and political agreement in Council.
12/2010	Completion of the co-decision process and publication of the Directive on industrial emissions within the Official Journal.

³ “Proposal for a Directive of the European Parliament and of the Council on industrial emissions (integrated pollution prevention and control) (recast)”. European Commission, Brussels, 21st December 2007. Available from: <http://ec.europa.eu/environment/ippc/proposal.htm>

⁴ “Commission Staff Working Document: Accompanying document to the Proposal for a Directive of the European Parliament and of the Council on industrial emissions (integrated pollution prevention and control) (recast). Impact Assessment.” European Commission, Brussels, 21st December 2007. Available from: <http://ec.europa.eu/environment/ippc/proposal.htm>

Date	Description
07/2012	Member States fully transpose the new Directive (18 months after entry into force). The Directive applies to all new installations from this date onwards.
01/2014	All existing installations previously subject to IPPC, Waste Incineration, Solvent Emissions and Titanium Dioxide Directives must meet the requirements of the new Directive. Large Combustion Plants do not yet need to meet the new Emission Limit Values (ELVs) prescribed within the Directive
07/2015	The newly prescribed activities such as additional non-hazardous waste recovery installations, smaller combustion units and wood preservation activities must meet the requirements of the new Directive.
01/2016	Large Combustion Plants must meet the requirements set out in Chapter 2 of the new Directive, as well as the ELVs set out in Annex V

1.2.2 Proposed Changes

The changes discussed in this document are outlined in section 5.3 of Annex I of the proposed IE(IPPC)D. The table below compares these proposals with the original IPPC Directive (IPPCD) (amendments are highlighted in grey).

Table 1.2 Proposed changes in IE(IPPC)D compared to the original IPPCD

Original IPPCD	Proposed IE(IPPC)D
<p>5.3. Installations for the disposal of non-hazardous waste as defined in Annex II A to Directive 75/442/EEC under headings D8 and D9, with a capacity exceeding 50 tonnes per day involving the following activities:</p> <ul style="list-style-type: none"> (a) biological treatment (b) physico-chemical treatment 	<p>5.3 Disposal <u>or recovery</u> of non-hazardous waste <u>as defined in Annex II A to Directive 75/442/EEC under headings D8 and D9</u>, with a capacity exceeding 50 tonnes per day involving the following activities:</p> <ul style="list-style-type: none"> (a) biological treatment; (b) physico-chemical treatment; (c) pre-treatment of waste for co-incineration; (d) treatment of slags and ashes; (e) treatment of scrap metal.

The fundamental change proposed by IE(IPPC)D is to extend the scope of IPPC to include 'treatment for recovery' (above the relevant threshold) rather than just 'treatment for disposal'.

The meaning of the following terms is therefore important for outlining the scope of this assessment:

- Waste
- Hazardous and non-hazardous waste
- Disposal
- Recovery
- Treatment
- Pre-treatment
- Biological treatment
- Physico-chemical treatment

These terms are not defined in the proposed IE(IPPC)D therefore, for the purposes of this assessment, we have used the interpretation adopted in Defra's EPR-WFD⁵ guidance and the Environment Agency's EPR2⁶ guidance. A brief summary of the position taken in these documents is provided in the table below:

Table 1.3 Definition of key terms affecting the scope of this assessment

Term	Definition
Waste	Consolidated Waste Framework Directive (WFD, Council Directive 2006/12/EC): <ul style="list-style-type: none"> ▪ Article 1(a) Any substance or object ... which the holder discards or intends or is required to discard. ▪ Article 2: excluded categories of waste Subject to further Defra guidance on the definition of waste. ⁷

⁵ Defra (2008), The Waste Framework Directive: Environmental Permitting Guidance for the Environmental Permitting Regulations (England and Wales) Regulations 2007.

⁶ Environment Agency (March 2008), Environmental Permitting Guidance for the Environmental Permitting Regulations (England and Wales) Regulations 2007: Regulatory Guidance Series, No. EPR 2: Understanding the meaning of regulated facility, Version 1.0.

⁷ Available at www.defra.gov.uk/environment/waste/topics/pdf/ecj-definition.pdf

Term	Definition
Hazardous waste	<p>Hazardous wastes are defined in the Hazardous Waste Directive (HWD, Council Directive 91/689/EC).</p> <p>Waste is defined as hazardous if they possess one or more hazardous properties set out in the HWD (e.g. flammable, toxic).</p>
Non-hazardous waste	<p>Non-hazardous wastes do not possess any of the hazardous properties set out in the HWD.</p>
Disposal Recovery	<p>Article 1(e) of the WFD states that "disposal" shall mean any of the operations listed in Annex IIA to the Directive.</p> <p>Article 1(f) of the WFD states that "recovery" shall mean any of the operations listed in Annex IIB to the Directive.</p> <p>However, the Court has explained that the lists of disposal and recovery operations in Annex IIA and Annex IIB to the WFD are intended to provide illustrations of the way these operations are carried out in practice and are not intended to be exhaustive. An operation may be disposal or recovery within the meaning of the WFD even if it is not listed in Annex IIA and Annex IIB.</p> <p>The terms recovery and disposal are mutually exclusive - a given operation cannot be both a disposal and a recovery operation.</p> <p>The key feature of a recovery operation is that its principal objective is to ensure that waste serves a useful purpose by replacing other substances which would have had to be used for that purpose (thereby conserving natural resources).</p> <p>Disposal operations however are primarily aimed at getting rid of waste. Any benefits that result as a secondary consequence will not affect the nature of the operation.</p>
Treatment	<p>For the purposes of this assessment all treatment can be considered to be either biological or physico-chemical treatment.</p> <p>The current Environment Agency interpretation of 'treatment' for sewage treatment works (STWs) is that primary, secondary or tertiary sewage treatment is covered by the Urban Waste Water Treatment Directive (UWWTD) and is not subject to IPPCD. However, other ancillary activities at STWs, such as sludge treatment, would be covered by IPPCD. It has been assumed that this interpretation would be applied to the IE(IPPC)D proposals.</p>
Pre-treatment	<p>Pre-treatment is a physical, thermal, chemical or biological process (including sorting) that changes the characteristics of the waste in order to reduce its volume, facilitate its handling and enhance its recovery.</p>

Term	Definition
Co-incineration	<p>The Waste Incineration Directive (WID, Council Directive 2000/76/EC) defines a co-incineration plant as any stationary or mobile plant whose main purpose is the generation of energy or production of material products, and which uses waste as a regular or additional fuel or in which waste is thermally treated for the purpose of disposal. The WID definition of co-incineration plant also includes related operations and equipment around the plant, including pre-treatment of waste.</p>
Biological treatment	<p>For the purposes of this report, biological treatment includes : anaerobic digestion or partial composting.</p>
Physico-chemical treatment	<p>Physico-chemical treatment means the physical and/or chemical treatment of waste i.e. non-biological treatment.</p> <p>The type of treatment techniques are not specified, although further guidance is provided as follows. It is not necessary that there is both physical and chemical treatment, although in some cases there will be both. The simple handling of waste in a way which does not change the composition of the waste, such as compaction or other re-packing of dry waste (such as cardboard) to reduce air content would not normally be considered to be physico-chemical treatment. However, where compaction does result in a change in the composition of the waste, the activity should be regarded as physico-chemical treatment.</p> <p>The following are provided as examples as provided in the Regulations and the Environment Agency Guidance Document: Classifying and Coding Wastes from Treatment Facilities:</p> <ul style="list-style-type: none"> ▪ Mechanical separation ▪ Pulverization ▪ Evaporation ▪ Drying ▪ Calcination ▪ Physical separation ▪ Neutralisation ▪ Chemical or thermal disinfection ▪ Dewatering ▪ Stabilisation ▪ Blending ▪ Thermal treatment of solid waste ▪ Mechanical separation

1.2.3 Activities and Industry Sectors Affected

A range of waste treatment sub-sectors are potentially affected by the changes, as shown in the table below:

Table 1.4 Waste treatment sub-sectors affected by the proposals

Non-hazardous waste disposal or recovery or activity	Types of activity	Industry sectors
Biological treatment	Composter Anaerobic digestion Mechanical biological treatment (MBT)	Water industry Municipal waste treatment by local authorities, their contractors and commercial enterprises.
Physico-chemical treatment	Sludge dewatering, thickening, treatment with lime and drying Material recovery facility (MRF) Physical treatment facility Physico-chemical treatment facility Chemical treatment	Water industry Municipal waste treatment by local authorities, their contractors and commercial enterprises. Treatment of industrial wastes by commercial enterprises.
Pre-treatment for co-incineration	MBT plus segregation of recyclables followed by drying, shredding or being pulverised for further recovery as a fuel.	Municipal waste treatment by local authorities, their contractors and commercial enterprises. Treatment of industrial wastes by commercial enterprises.
Treatment of slags and ashes	Grading, grinding, washing.	Power and iron & steel sector companies and their contractors. Aggregate companies.

Non-hazardous waste disposal or recovery or activity	Types of activity	Industry sectors
Treatment of scrap metal	Physical treatment to separate or segregate metal wastes through the process of shredding, sorting, grading, baling and shearing.	End of life vehicles dismantling and recovery (not including depolluting vehicles as this is considered to be treatment of hazardous waste). Waste Electrical and Electronic Equipment recovery. Metal recycling.

The information illustrated in Table 1.3 is an illustrative sample of the types of activities that will be affected by the proposed changes to the directive. There may be other activities not covered in this report which may be affected by the changes. Due to the scale of the sectors being included, it was appropriate to take a sample of the main types of activities for discussion in this report.

From the table above it is clear that a wide range of water and waste management sector activities and companies could be affected by the changes outlined in section 5.3, Annex I of the proposed IE(IPPC)D. For the purposes of this report the proposed changes are assessed for the following:

- Water industry - biological and physico-chemical treatment for disposal or recovery;
- Waste management industry - treatment for disposal or recovery:
 - Biological treatment;
 - Physico-chemical treatment;
 - Pre-treatment for co-incineration;
 - Treatment of slags and ashes;
 - Treatment of scrap metal.

1.3 **What are the objectives and intended effects?**

The main drivers for the revision of industrial emissions legislation are described in the Impact Assessment (IA) undertaken by the Commission:

- the Lisbon Strategy and the EU Sustainable Development Strategy; this strategy stresses the role of environmental technologies in having “*significant economic, environmental and employment potential*”;
- the different Thematic Strategies (Air Pollution, Soil Protection, etc.) set objectives to protect human health and the environment from key air pollutants. Industrial emissions regulation has a major role in meeting these objectives;
- the need for “Better Regulation” and designing laws and legislation in a more coherent way and with minimum administrative burden;
- experience in the implementation of the IPPCD in the last 10 years and ways to improve the legal framework to ensure that its objectives are met.

The Commission’s proposals aim to address the issues identified via a number of amendments to the existing legislation including the following:

- clarification and strengthening of the concept of best available techniques (BAT);
- revision of the minimum emission limit values (ELVs) for some sectors (for example, large combustion plants) to bring them into line with BAT standards;
- introduction of provisions on inspection and environmental improvements;
- stimulating innovation and the development and deployment of new techniques;
- simplifying and clarifying certain provisions on issuing permits, monitoring and reporting to cut unnecessary administrative burdens; and
- extending and clarifying the scope and provisions of the legislation to better contribute to the objectives of the Thematic Strategies.

The first and last points presented above relating to strengthening of the BAT concept. The clarification and extension of the scope and provisions of the existing legislation are most relevant to the changes concerning non-hazardous waste treatment installations.

The Commission’s own impact assessment identifies a significant issue associated with the current IPPCD whereby the treatment of non-hazardous wastes is covered under the current scope of the IPPCD only if it results in final compounds or mixtures which are discarded through disposal operations. This means that similar installations (with similar environmental impacts) resulting in waste or products (e.g. composting) which are not disposed of but recovered or used as products are not covered under the scope of the IPPCD. These inconsistencies result in possible distortion of competition between disposal and recovery activities and where appropriate and dependent upon the activities undertaken a lower level of environmental protection for installations not covered under the IPPCD. The Commission’s own analysis suggests that removing the current inconsistencies would lead to significant environmental benefits (linked to the implementation of BAT) and limited

economic and social impacts. In addition, positive impacts on the consistent permitting of these installations are expected contributing to the objectives of the Waste Thematic Strategy.

The Commission has also reviewed which non-hazardous waste treatment activities are covered under the scope of the IPPCD, and recommended the inclusion of:

- pre-treatment of waste for co-incineration;
- treatment of slags and ashes;
- treatment of scrap metal.

The Commission's assessment of this proposal suggests that about 230 integrated shredders of End of Life Vehicles (ELV) and Waste Electrical and Electronic Equipment (WEEE) would be affected by this proposal in the EU. Other installations within this sector would fall below the threshold of 50 tonnes per day. These installations already fall under the scope of the ELV and WEEE Directives and are subject to minimum requirements for the protection of environmental media.

The Commission has identified that the environmental benefits would be significant mainly due to reductions of dust and dioxin emissions from these installations. The Commission has also stated that, in those Member States where BAT has already been implemented, the economic impacts of including this sector within the scope of the Directive would be limited and that no significant additional administrative costs are expected since these installations are already subject to permitting under waste legislation.

2. Policy Options

This section presents the policy options considered in this report for the proposed changes in thresholds for non-hazardous waste treatment installations. These were discussed and agreed with Defra at the inception meeting (8th April 2008).

The following two options have been considered for non-hazardous waste treatment installations for disposal and recovery:

2.1 Option 1 - Business as Usual

1. Option 1 is the business as usual (BAU) case and explores the current costs and benefits associated with the existing regulatory regime and business climate for organisations undertaking the treatment of non-hazardous wastes for disposal only (i.e. not treatment for recovery). The BAU case also excludes pre-treatment for co-incineration, treatment of slags and ashes, and treatment of scrap metal from IPPC. The option represents 'no change' from the situation currently foreseen.

2.2 Option 2 - Implementation of Section 5.3, Annex I of the proposed IE(IPPC)D

2. Option 2 explores the costs and benefits associated with implementing the proposals in Section 5.3, Annex I of the proposed IE(IPPC)D, which would extend IPPC to include both treatment for disposal and treatment for recovery of non-hazardous wastes and would additionally include pre-treatment for co-incineration, treatment of slags and ashes, and treatment of scrap metal.

3. Who is affected?

This section presents a list of those stakeholders likely to be affected by the proposed changes to include treatment greater than 50 tonnes per day of non-hazardous waste for recovery, along with the inclusion of pre-treatment for co-incineration of waste, treatment of slags and ashes, and treatment of scrap metal.

Essentially the main groups to be affected by the proposals will be:

- Operators of non-hazardous waste treatment installations currently falling outside of the scope of the IPPCD (i.e. > 50 tonnes per day treatment capacity for recovery) will be affected by the proposed changes, including organisations from the following sectors:
 - Water industry;
 - Municipal waste treatment by local authorities, their contractors and commercial enterprises;
 - Treatment of industrial wastes by commercial enterprises.
- Operators of non-hazardous waste operations undertaking pre-treatment for co-incineration in facilities with a treatment capacity > 50 tonnes per day;
- Operators of non-hazardous waste operations undertaking treatment of slags and ashes in facilities with a treatment capacity > 50 tonnes per day;
- Operators of non-hazardous waste operations undertaking treatment of scrap metal in facilities with a treatment capacity > 50 tonnes per day;
- Competent authorities regulating non-hazardous waste operations in facilities with a treatment capacity > 50 tonnes per day, including:
 - Environment Agency for England and Wales;
 - Scottish Environmental Protection Agency (SEPA);
 - Environment and Heritage Service Northern Ireland (EHSNI);
 - Defra and the devolved administrations of Scotland and Wales
- Other stakeholders, including industry associations.

In addition to Competent Authorities and industry operators, the following stakeholders have also been contacted in order to inform the development of this report:

- National Industrial Symbiosis Programme (NISP) – contacted due to its involvement in the recovery of waste materials for reuse. The programme represents businesses from

across the entire range of activities listed in section 5.3 of the proposed changes to IE(IPPC)D and therefore has an interest in potential changes to the legislation, and how these changes may affect the recovery of materials in the UK as a consequence. NISP sit on a number of steering groups including the Waste Protocols⁸ and have worked with the Environment Agency in the production of the Low Risk Regulation initiative⁹ for England and Wales.

- Water UK – works on behalf of the water industry therefore were contacted to provide a view on how the proposed changes may or may not affect the industry.
- The British Metals Recycling Association – represents the industry at a government level, lobbying in Westminster for and on behalf of scrap metal recycling businesses. The BMRA has an interest on behalf of its members to inform and guide the industry on new and forthcoming pieces of legislation.

⁸ The Waste Protocols is a BREW-funded project jointly led by the Environment Agency and Waste and Resources Action Programme to remove recovered waste materials that are processed to an agreed standard from the current regulatory regime. Further detail on this project is available from http://www.environment-agency.gov.uk/subjects/waste/1019330/1334884/1721333/?lang=_e

⁹ The low risk regulation is an initiative set up to identify low risk waste activities that are not exempt from waste management licensing but which do not justify enforcement. The Environment Agency has produced guidance that is available from their website: http://www.environment-agency.gov.uk/commodata/acrobat/low_risk_jan08_2012867.pdf

4. Baseline Definition

The three key elements of the business as usual baseline are (1) the current legislation relevant to non-hazardous waste treatment for recovery and disposal at facilities with a capacity greater than 50 tonnes per day, which in turn informs (2) the estimates of the number of installations already affected by the IPPCD and (3) the emissions from, and other environmental impacts of, these sites.

4.1 Relevant legislation and regulatory requirements

Statutory Instruments

The regulation of non-hazardous waste treatment facilities is achieved through a range of different statutory instruments in England and Wales, Scotland and Northern Ireland. The purposes of these statutory instruments are broadly similar, but a basic understanding of the different regimes is required in order to estimate the number of installations currently covered by the IPPCD and those potentially affected by the proposed IE(IPPC)D.

Table 4.1 Relevant statutory instruments for the treatment of non-hazardous waste

Scope of the IPPCD and IE(IPPC)D	Waste Treatment Activity and the IPPCD ^[1]	UK Administrative Area	Statutory Instrument
Covered by the current IPPCD	Treatment of non-hazardous waste for <u>disposal</u> in facilities with a capacity > 50 tonnes per day.	England and Wales	Schedule 1 of the Environmental Permitting (England and Wales) Regulations 2007 SI 2007 No. 3538
		Scotland	Pollution Prevention and Control (Scotland) Regulations 2000
		Northern Ireland	The Pollution Prevention and Control Regulations (Northern Ireland) 2003

Scope of the IPPCD and IE(IPPC)D	Waste Treatment Activity and the IPPCD ^[1]	UK Administrative Area	Statutory Instrument
Not covered by the current IPPCD. Proposed coverage by IE(IPPC)D.	Treatment of non-hazardous waste for <u>recovery</u> in facilities with a capacity > 50 tonnes per day.	England and Wales	Regulation 2 of the Environmental Permitting (England and Wales) Regulations 2007 SI 2007 No. 3538
		Scotland	Waste Management Licensing Regulations 1994, as amended
		Northern Ireland	The Waste Management Licensing Regulations (Northern Ireland) 2003.
Not covered by the current IPPCD. Not proposed for coverage by IE(IPPC)D.	Treatment of non-hazardous waste for <u>disposal</u> in facilities with a capacity <50 tonnes per day.	England and Wales	Regulation 2 of the Environmental Permitting (England and Wales) Regulations 2007 SI 2007 No. 3538
		Scotland	Waste Management Licensing Regulations 1994, as amended
		Northern Ireland	The Waste Management Licensing Regulations (Northern Ireland) 2003.

Note 1 Covering biological and physico-chemical treatment, pre-treatment for co-incineration, treatment of slags and ashes and treatment of metals

Although there is considerable variability between the UK administrative areas in the statutory instruments associated with non-hazardous waste treatment, the requirements of these regulations are broadly similar.

For the purposes of this report we have included a common 'short name' for each of the main regulatory requirements. In summary these are:

- EPR-IPPC: activities that are already covered by UK BAT-based regulation.
- EPR-IPPC Part A: activities that are covered by the IPPCD and UK BAT-based regulation:
- EPR-IPPC Part B: activities that are not covered by the IPPCD but are covered by UK BAT-based regulation (emissions to air only).
- EPR-waste: operations covered by the WFD but not the IPPCD

- EPR-waste exempt: operations covered by the WFD but exempt from the requirement to obtain a permit.

For simplicity, the regulatory mechanism is described as a permit or an exemption, although it is recognised that for EPR-waste the appropriate term in Scotland and Northern Ireland is 'waste management licence' (WML).

The table below provides more detail on the different types of permits and licences required in the UK for the non-hazardous waste treatment activities covered in the IE(IPPC)D.

Table 4.2 Categories of regulated sites discussed in this report

Treatment activities > 50 tonnes per day	Currently covered by the IPPCD?	Affected by the IE(IPPC)D proposals?	Current UK regulatory regime	
Biological treatment for disposal	Yes	No - not considered further.	EPR-IPPC (Part A)	Section 5.3 A(1)(c)(i) Disposal of non-hazardous waste in a facility with a capacity of more than 50 tonnes per day by biological treatment.
Physico-chemical treatment for disposal	Yes	No - not considered further	EPR-IPPC (Part A)	Section 5.3 A(1)(c)(ii)
Biological treatment for recovery	No	Yes	EPR-waste EPR-waste exemptions	
Physico-chemical treatment for recovery	No	Yes	EPR-waste EPR-waste exemptions	
Pre-treatment for co-incineration for disposal or recovery	No	Yes	EPR-IPPC (Part A)	Pre-treatment at the co-incineration plant, directly associated activity to a listed Section 5.1 A(1)(c) activity. Making solid fuel from waste using heat: Section 5.5 A(1)(a).
			EPR-waste	

Treatment activities > 50 tonnes per day	Currently covered by the IPPCD?	Affected by the IE(IPPC)D proposals?	Current UK regulatory regime	
Treatment of slags and ashes for disposal or recovery	No	Yes	EPR-IPPC (Part B)	Section 3.5 B(a) Crushing, grinding, size reduction, grading, screening or heating of mineral or mineral product where the operation is likely to result in the release of particulate matter to air.
Treatment of scrap metal for disposal or recovery	No	Yes	EPR-waste EPR-waste exemptions	

4.2 Overview of regulatory requirements

4.2.1 EPR-IPPC requirements

Currently, an IPPC permit is required for non-hazardous waste installations that undertake treatment for disposal with a capacity greater than 50 tonnes per day. The integrated permit covers all environmental aspects of the installation, from acceptance of waste, odour and noise management to emissions to the environment and preventing accidents that may give rise to environmental impacts.

At present, operators need to apply for an EPR-IPPC permit, which involves completion of an application form and supporting documentation such as: application site report, site plans and assessment of environmental impacts. It may also include an odour or noise management plan. The operator is then issued with a permit from the competent authority which requires them to use BAT, also referred to as 'appropriate measures' in the SGN's published by the Environment Agency in relation to all EPR-IPPC requirements (i.e. management, accidents, energy efficiency, efficient use of raw materials, disposal and recovery of wastes, operating techniques, closure and decommissioning, site protection and monitoring programme, odour, noise and vibration, monitoring, records and notifications). The permit will include installation-specific emission limits, monitoring requirements and improvement conditions.

Discussions with the Environment Agency and several operator companies indicated that they would expect 'standard permits' for non-hazardous waste treatment (recovery and disposal) EPR-IPPC activities to be used to implement the requirements of the proposed IE(IPPC)D; these are currently available for EPR-waste operations. A standard permit is a set of rules that the site must meet to ensure that it does not pose an unacceptable risk to the environment. Although standard permits are not currently available in Scotland and Northern Ireland, the 'standard' permits are assumed to give a good indication of the regulatory requirements for operators in the EPR-waste category.

Application for a standard permit is a simpler process compared to that for a 'bespoke' permit and costs are reduced due to the limited effort to produce the permit. However this would only be possible if the operator could comply with the rules and the site can meet the following criteria:

- The only discharges to controlled waters are surface water from the roofs of buildings and from areas of the site not used for the storage or treatment of wastes.
- The activities are not carried out within 500 metres of a European site, Ramsar site or Site of Special Scientific Interest (SSSI) as outlined in the Defra Environmental Permitting Core Guidance document 2007 and the Standard Rules Chapter 4 of the EPR.

4.2.2 EPR-waste requirements

Differences between EPR-IPPC and EPR-waste

The Environment Agency¹⁰ has confirmed that IPPC installations and waste operations regulated under EPR will be identical with respect to the administrative requirements for the operator and regulator; layout and presentation of permits; and auditing / inspection. However, there are some fundamental differences for sites regulated under EPR-IPPC and EPR-waste as indicated in the following table.

Table 4.3 Main differences between the regulatory and permitting requirements^[1] for EPR-IPPC and EPR-waste

Requirement	EPR-IPPC	EPR-waste
Main sources of regulatory requirements	IPPCD, 2008/01/EC	Waste Framework Directive (WFD), 2006/12/EC (codified version of Directive 75/442/EEC, as amended)

¹⁰ Telephone conversation with EPR Policy Advisor, Environment Agency on 23rd May 2008.

Requirement	EPR-IPPC	EPR-waste
General principles	<p>Article 3 of the IPPCD sets out general principles which include requirements that:</p> <ul style="list-style-type: none"> ▪ all the appropriate preventive measures are taken against pollution, in particular through application of the BAT; ▪ no significant pollution is caused. <p>The general principles also require specific consideration of:</p> <ul style="list-style-type: none"> ▪ energy efficiency; ▪ waste hierarchy principles; ▪ waste disposal issues; ▪ accident prevention; and ▪ securing site protection on closure. <p>If significant pollution would be caused, even after applying BAT stricter conditions (or refusal) may be applied.</p>	<p>Article 4 sets out the relevant objectives of the WFD, which include requirements that waste is recovered or disposed of without endangering human health and without using processes or methods which could harm the environment and in particular without</p> <ul style="list-style-type: none"> (i) risk to water, air, soil, plants or animals; or (ii) causing nuisance through noise or odours; or (iii) adversely affecting the countryside or places of special interest; <p>The key differences to note for EPR-waste compared to EPR-IPPC is that there is no requirement to apply BAT. Ultimately EPR-waste is aimed at primary impacts on the environment (i.e. emissions), rather than looking at a high level of environmental protection and issues such as the use of raw materials or process efficiency.</p>
Other requirements	<p>The IPPCD requires a consideration of the effects of:</p> <ul style="list-style-type: none"> ▪ raw materials; ▪ implications for soil and groundwater; ▪ monitoring; and ▪ waste management. 	No equivalent under WFD.

Requirement	EPR-IPPC	EPR-waste
BAT & ELVs	<p>ELVs must be included for polluting substances that are likely to be emitted in significant quantities (this requirement does not apply to emissions of carbon dioxide from those installations that are subject to the EU Emissions Trading Scheme).</p> <p>The ELVs must be based on BAT, “but shall take account of the technical characteristics of the particular installation..., its geographical location and the local environmental conditions”.</p>	No equivalent under WFD.
ELVs and European environmental quality standards (EQS)	If a European EQS requires a stricter ELV than indicated on the basis of BAT, the regulator must impose that ELV or consider refusing the permit altogether.	The general objectives of the WFD could be considered equivalent to the ELV/EQS requirements of the IPPCD.
ELVs and equivalent technical measures	ELVs may be supplemented or replaced by “equivalent parameters or technical measures” where it more appropriate or effective to demonstrate process control.	No equivalent under WFD.

1 Source of data: Environment Agency, Regulatory Guidance Series No EPR4: Setting standards for environmental protection, Version 1.0 March 2008.

In summary, despite the parallels between EPR-IPPC and EPR-waste there are still differences between the permits that regulators can issue for the two types of activities, specifically:

- Permits for EPR-IPPC should require the operator to implement BAT. There is no equivalent requirement for EPR-waste.
- Permits for EPR-IPPC should consider the impact on the environment taken as a whole, which is not just the impact of emissions but also wider impacts associated with impacts such as energy efficiency, raw materials or process efficiency.

It is therefore important to recognise that it is not possible to implement the same standard rules for EPR-IPPC activities and EPR-waste operations.

Standard permits

The table below identifies the current standard permits available for certain EPR-waste operations (i.e. treatment for recovery) in England and Wales. Although standard permits are not currently available in Scotland and Northern Ireland the 'standard' permits are assumed to give a good indication of the regulatory requirements for operators in the EPR-waste category. The scope of these permits is based on the WFD, which is not as broad as the current IPPCD. The information provided in this section therefore provides a good indication of the type of regulatory requirements that apply to non-hazardous waste treatment activities that are currently outside the scope of the IPPCD but which would be affected by the IE(IPPC)D proposals.

Table 4.4 Standard EPR-waste permits relevant to the sectors affected by the IE(IPPC)D proposals^[1]

IE(IPPC)D Activities	Standard EPR-waste permits	Additional qualifying requirements
Water sector physico-chemical and biological treatment	Non-hazardous sludge biological chemical and physical treatment site.	<p>Two types of standard permit are available with the following thresholds on annual waste accepted:</p> <ul style="list-style-type: none"> ▪ < 75,000 tonnes/year ▪ < 250,000 tonnes / year <p>Liquids may be discharged into the head works of a sewage works or a sewer subject to a consent issued by the local water company and may be taken off-site in a tanker for disposal or recovery.</p>

IE(IPPC)D Activities	Standard EPR-waste permits	Additional qualifying requirements
Waste management sector biological treatment	Non-hazardous mechanical biological (aerobic) treatment facility.	<p>Three types of standard permit are available with the following thresholds on annual waste accepted:</p> <ul style="list-style-type: none"> ▪ < 5,000 tonnes/year ▪ < 25,000 tonnes / year (only available for waste treatment inside a building) ▪ < 75,000 tonnes /year (only available for waste treatment inside a building) <p>The waste storage and treatment building must be at least 250 metres away from any residential property or workplace.</p>
	<p>Composting in open windrows.</p> <p>Composting in closed vessels.</p>	<p>Three types of standard permit are available with the following thresholds on annual waste accepted:</p> <ul style="list-style-type: none"> ▪ < 5,000 tonnes/year ▪ < 25,000 tonnes / year (only available for waste treatment inside a building) ▪ < 75,000 tonnes /year (only available for waste treatment inside a building) <p>The storage, physical treatment, composting and maturation of wastes must be at least 250 metres away from any residential property or workplace.</p> <p>The activities must also be outside groundwater protection zones 1 (inner) or 2 (outer) and more than 250 metres from any water abstraction point.</p> <p>The activities are not carried out within 1 kilometre of a European site, Ramsar site or Site of Special Scientific Interest (SSSI).</p>

IE(IPPC)D Activities	Standard EPR-waste permits	Additional qualifying requirements
Waste management sector physico-chemical treatment	<p>Household, commercial and industrial waste transfer station with treatment.</p> <p>Household, commercial and industrial waste transfer station with treatment (no building).</p> <p>Household, commercial and industrial waste transfer station with treatment and asbestos storage.</p> <p>Household, commercial and industrial waste transfer station with treatment and asbestos storage (no building).</p> <p>Materials recycling facility.</p> <p>Materials recycling facility (no building).</p>	<p>Three types of standard permit are available with the following thresholds on annual waste accepted:</p> <ul style="list-style-type: none"> ▪ < 5,000 tonnes/year ▪ < 25,000 tonnes / year (only available for waste treatment inside a building) ▪ < 75,000 tonnes /year (only available for waste treatment inside a building) <p>Non-hazardous wastes must be stored on impermeable surface with sealed drainage.</p> <p>Specified wastes must be stored on hard standing or on impermeable surface with sealed drainage.</p>
Pre-treatment for co-incineration	No standard permits currently available.	-
Treatment of slags and ashes	No standard permits currently available.	-
Treatment of scrap metal	<p>Metal recycling site.</p> <p>Waste electrical and electronic equipment authorised treatment facility (ATF) excluding ozone depleting substances.</p>	<p>Three types of standard permit are available with the following thresholds on annual waste accepted:</p> <ul style="list-style-type: none"> ▪ < 5,000 tonnes/year ▪ < 25,000 tonnes / year (only available for waste treatment inside a building) ▪ < 75,000 tonnes /year (only available for waste treatment inside a building)

Note 1 This table is based on the standard EPR-waste permits available from the Environment Agency. SEPA also makes standard permits available, but the exact details may differ slightly.

There are common requirements for the standard permit as detailed below:

- General management: activities shall be managed and operated in accordance with a management system.
- Competence: the operator shall comply with the requirements of an approved competence scheme or shall hold an appropriate certificate of technical competence or other approval.
- Accident management plan: the operator shall maintain and implement an accident management plan.
- Operations: the operator shall only accept waste if it is of a type and quantity covered by the standard permit and conforms to the description in the documentation supplied by the producer and holder.
- Point source emissions: there shall be no point source emissions to air, water or land.
- Fugitive emissions: emissions shall not cause pollution. This can be demonstrated by the following:
 - Buildings for waste treatment shall be maintained under negative pressure and fitted with extraction systems with relevant physical control (e.g. bio-filters).
 - Waste is stored and treated on an impermeable surface with sealed drainage system.
 - All liquids, whose emission to water or land could cause pollution, shall be provided with secondary containment, unless the operator has used other appropriate measures to prevent or where that is not practicable, to minimise, leakage and spillage from the primary container.
 - Fugitive emissions management plan is implemented.
- Odour: emissions shall be free from odour at levels likely to cause annoyance outside the site. The appropriate measures for demonstrating control of odour include implementation of an approved odour management plan.
- Noise and vibration: emissions shall be free from noise and vibration at levels likely to cause annoyance outside the site. The appropriate measures for demonstrating control of noise and vibration include implementation of an approved noise and vibration management plan.
- Pest: scavenging animals, scavenging birds and other pests shall not cause nuisance.
- Reporting and notification requirements.

Additional requirements under IE(IPPC)D

As identified above EPR-waste permits do not currently require the operator to implement BAT. However, from the previous section, for the purposes of this assessment, it seems reasonable to conclude that an EPR-waste permit requires the equivalent of BAT for

- General management
- Operator competence
- Accident management
- Point source and fugitive emissions
- Odour
- Noise and vibration
- Pests

These requirements are primarily focussed on measures to protect the immediate environment. However, IE(IPPC)D requirements would require consideration against BAT of the following, which are not necessarily fully covered by existing EPR-waste permits.

- Resource efficiency:
 - The purpose of waste recovery activities is to reduce the consumption of natural resources, both in terms of the materials being recovered and also the 'embedded' water and energy originally required to create the original product. If the waste treatment process does not produce a quality product the opportunities for recovering value through waste treatment is very much diminished.
- Selection of appropriate treatment techniques: techniques should be designed and operated to avoid deliberate or inadvertent production and/or displacement of substances that may be harmful to the environment and to prevent the transfer of such substances from one environmental medium to another.

4.2.3 EPR-waste exemption requirements

Waste operations that are exempt from EPR-waste permitting requirements are required to register with the competent authority. The table below identifies the EPR-waste exemptions relevant to this assessment, including the thresholds over which an EPR-waste permit is required.

Table 4.5 EPR-waste exemption thresholds for each of the activity types identified in section 5.3, Annex 1 of the proposed IE(IPPC)D

IE(IPPC)D Activities	Examples of the likely installations affected	Relevant EPR-waste exemption	
Biological treatment	Water industry anaerobic digestion.	Paragraph 10 (Notifiable)	Treatment of <100,000 tonnes / year of sewage treatment sludge (equivalent to average of <274 tonnes/day).
	Waste industry anaerobic digestion.	Paragraph 12 (Simple)	Anaerobic digestion of up to 1000m ³ of waste at any one time (including the storage of waste prior to and following treatment via AD).
	Composting.	Paragraph 12 (Simple)	<p>Composting biodegradable waste, so long as the total quantity of waste on-site remains < 1,000 cubic metres at the place of production or the place of landspreading. The threshold rises to 10,000 tonnes per year for mushroom compost.</p> <p>The equivalent exemption in Scotland limits the amount of waste to 400 tonnes or 1000 tonnes depending on waste type. Rises to 2,500 tonnes for mushroom composting.</p>
	Mechanical biological treatment (MBT).	No exemption.	-

IE(IPPC)D Activities	Examples of the likely installations affected	Relevant EPR-waste exemption		
Physico-chemical treatment: <ul style="list-style-type: none"> ▪ Physical separation ▪ Neutralisation ▪ Chemical or thermal disinfection ▪ Dewatering ▪ Stabilisation ▪ Blending 	Water industry sludge treatment.	Paragraph 10 (Notifiable)	Treatment of <10,000 tonnes /year of water treatment sludge imported from outside the STW (equivalent to an average of <27.4 tonnes/day). Treatment of <100,000 tonnes / year of sewage treatment sludge imported from outside the STW (equivalent to average of <274 tonnes/day).	
	Industrial units undertaking waste sorting and treatment to facilitate recovery.	Paragraph 11 (Simple)	Treatment of specified single-stream (i.e. not mixed wastes) waste materials, operations and limits:	
			Waste	Limit (tonnes per week)
			Paper or cardboard	3,000 (600 tonnes per day)
			Textiles	100 (20 tonnes per day)
			Plastic	100 (20 tonnes per day)
			Glass	1,000 (200 tonnes per day)
			Steel and aluminium cans, aluminium foil	100 (20 tonnes per day)
Pre-treatment for co-incineration	Treatment to produce refuse derived fuel (RDF) and solid recovered fuel (SRF).	No exemption.	-	
Treatment of slags and ashes	Physical separation, grading, grinding and washing of slags and ashes.	No exemption.	-	

IE(IPPC)D Activities	Examples of the likely installations affected	Relevant EPR-waste exemption	
Treatment of scrap metal	Waste electrical and electronic equipment (WEEE) treatment facilities	Paragraph 41 (England and Wales) Paragraph 47 (Scotland) (Notifiable)	<p>Treatment of <5 tonnes / day of WEEE.</p> <p>In Scotland there is also a 2 tonne per day limit for discarded equipment arising from both domestic and non-domestic premises that is not potentially a hazardous mirror entry. Allowance is made for storage of 50m³ for these wastes.</p> <p>In Scotland, there is also a 5 tonne per day limit for WEEE containing hazardous substances other than those specifically named. Allowance is made of storage of 80 m³.</p>
	Vehicle dismantler facilities (depolluted vehicles)	Paragraph 45 (Complex)	40 vehicles per week.
	End of life vehicle (ELV) treatment facilities	No exemption	The above exemption does not apply to activities to depollute ELVs as this involves the treatment of hazardous wastes (e.g. waste oils, lubricants, coolants, anti-freeze).
	Metal recycling site	Paragraph 45 (Complex)	<p>Sorting, grading, baling, shearing, compacting, cutting and crushing of ferrous metals and ferrous metal-alloys to a maximum of 8000 tonnes per week;</p> <p>Sorting, grading, baling, shearing, compacting, cutting and crushing of certain defined non-ferrous metals to a maximum of 400 tonnes per week;</p> <p>Sorting, grading, baling, shearing, compacting, cutting and crushing of turnings of the above to a maximum of 300 tonnes per week.</p>

Depending on the exemption, different levels of information must be provided as part of the registration reflecting the level of risk the activity poses. There are two types of exemption, 'simple' and 'notifiable' reflecting lower and higher risk activities; Table 4.5 identifies which

category the relevant exemptions fall under. For exemptions under Paragraph 45, the exemption is similar to notifiable but is not referred to as such in the regulations. Therefore, the term 'complex' has been used in this instance.

Operators of simple EPR-waste exempt activities must provide information to the competent authority identifying the exempt activity and provide administrative information such as contacts, organisation name and location of the exempt activity.

Operators of notifiable EPR-waste exempt activities must provide additional information to the competent authority so that they can assess the risks, specifically:

- Description of the exempt activity and justification as to why the activities constitute an exempt activity
- Amount of waste treated or recovered over a 12 month period and the maximum stored at any one time.
- Map or plan showing the site boundary, locations where the exempt activities are carried out, areas that are impermeable pavement / hardstanding / un-surfaced, and details of the site drainage system.
- Inclusion of a Pollution Risk Assessment that:
 - Describes how the waste will be stored securely.
 - Provides details of the pollution containment systems on the site in the areas where the waste is to be stored or treated, including impermeable pavements, drainage systems and other containment systems.
 - Describes how the operator intends to treat and recover the waste.
 - Specifies how the operator will control potential nuisance from the treatment, movement and storage of the waste.
 - Identifies if the land is within 1 km of an environmentally sensitive site.

If the risks are too high, the competent may refuse to register the activity as exempt. Most of these exemptions are charged and must be renewed annually.

4.2.4 Summary of Regulatory Requirements

A summary and comparison of the current regulatory requirements for the treatment of non-hazardous waste is provided in Table 4.6.

Table 4.6 Summary and Comparison of Non-Hazardous Waste Treatment Requirements

Topic Area	Current requirements for sites subject to EPR-IPPC on the basis of: treatment of non-hazardous waste for <u>disposal</u> in facilities with a capacity > 50 tonnes per day.	Current requirements for sites subject to EPR-waste on the basis of: treatment of non-hazardous waste for <u>recovery</u> in facilities with a capacity > 50 tonnes per day.	Current requirements for sites subject to EPR-waste exemptions on the basis of: treatment of non-hazardous waste for <u>recovery</u> in facilities with a capacity > 50 tonnes per day.
Management			
General Management	Activities to be managed and operated in accordance with a management system which identifies and minimises risks of pollution, and by competent persons. Records to demonstrate the above requirement to be maintained. Easy access to permit duties to be provided for personnel.		No requirement.
Accidents	Accident management plan.		No requirement. Non-statutory guidance provided in PPG 21 Pollution incident response planning.
Energy Efficiency	Take measures to ensure energy efficiency.	Voluntary commitment to Climate Change Levy Agreement enables operators to achieve reduced rate relief.	
Use of Raw Materials	Take measures to ensure raw materials and water are used efficiently.	In England and Wales and Northern Ireland, if you abstract > 20 m ³ /day of water from ground or surface waters, you must obtain an abstraction licence from the Environment Agency and the EHSNI, respectively. In Scotland, if you abstract > 10m ³ /day of water you must obtain authorisation from SEPA. If you abstract < 10m ³ /day of water per day and comply with certain general binding rules (GBRs) you do not need to contact SEPA.	

Topic Area	Current requirements for sites subject to EPR-IPPC on the basis of: treatment of non-hazardous waste for <u>disposal</u> in facilities with a capacity > 50 tonnes per day.	Current requirements for sites subject to EPR-waste on the basis of: treatment of non-hazardous waste for <u>recovery</u> in facilities with a capacity > 50 tonnes per day.	Current requirements for sites subject to EPR-waste exemptions on the basis of: treatment of non-hazardous waste for <u>recovery</u> in facilities with a capacity > 50 tonnes per day.
Avoidance, recovery and disposal of wastes produced by the activities	Take appropriate measures to ensure that waste produced by the activities is avoided or reduced, or where waste is produced it is recovered wherever practicable or otherwise disposed of in a manner which minimises its impact on the environment;	No requirement.	No requirement.
Site Security	Prevention of unauthorised access to site.		No requirement.

Topic Area	Current requirements for sites subject to EPR-IPPC on the basis of: treatment of non-hazardous waste for <u>disposal</u> in facilities with a capacity > 50 tonnes per day.	Current requirements for sites subject to EPR-waste on the basis of: treatment of non-hazardous waste for <u>recovery</u> in facilities with a capacity > 50 tonnes per day.	Current requirements for sites subject to EPR-waste exemptions on the basis of: treatment of non-hazardous waste for <u>recovery</u> in facilities with a capacity > 50 tonnes per day.
Operations			
Operating techniques	<p>Operating techniques shall only be in accordance with those described in the application.</p> <p>Waste shall only be accepted if it :</p> <ul style="list-style-type: none"> ▪ Is of a type and quantity provided for in the permit. ▪ Conforms to the description in the documentation supplied by the producer and holder. ▪ Processed in the manner specified in the permit. <p>Records shall be kept of all waste accepted onto the site.</p> <p>Provide information on waste produced at the installation to any waste recovery or disposal facility that receives the waste, including:</p> <ul style="list-style-type: none"> ▪ The nature of the process producing the waste ▪ The composition of the waste ▪ The handling requirements of the waste ▪ The waste code of the waste <p>Any waste sent to landfill meets the waste acceptance criteria for that landfill.</p>	<p>Waste shall only be accepted if it :</p> <ul style="list-style-type: none"> ▪ Is of a type and quantity provided for in the permit. ▪ Conforms to the description in the documentation supplied by the producer and holder. ▪ Processed in the manner specified in the permit. 	<p>Only wastes subject to the exemption can be treated.</p>

Topic Area	Current requirements for sites subject to EPR-IPPC on the basis of: treatment of non-hazardous waste for <u>disposal</u> in facilities with a capacity > 50 tonnes per day.	Current requirements for sites subject to EPR-waste on the basis of: treatment of non-hazardous waste for <u>recovery</u> in facilities with a capacity > 50 tonnes per day.	Current requirements for sites subject to EPR-waste exemptions on the basis of: treatment of non-hazardous waste for <u>recovery</u> in facilities with a capacity > 50 tonnes per day.
Improvement programme	Improvement conditions reinforce the application of BAT to: <ul style="list-style-type: none"> ▪ Improve process performance ▪ Reduce risks to the environment 	Non-standard EPR-waste may include improvement conditions to reduce risks to the environment.	No requirement.
Closure & Decommissioning	Prevention or minimisation of activities that create pollution risk on closure / decommissioning, and maintenance of site closure plan.		No requirement. The Construction (Design and Management) Regulations 2007 (CDM 2007) require operators to undertake work in a manner that reduces health and safety risks to workers, which in turn may have environmental benefits.
Site Protection & Monitoring	Submission, implementation and maintenance of site protection and monitoring programme.	EPR-waste site protection requirements	Groundwater Regulations. Contaminated Land Regulations.
Emissions & Monitoring			
Water, air or land	Point source discharges to water, air or land to not cause pollution, unless the operator has used appropriate measures, including those specified in the permit, to prevent or where that is not practicable, to minimise, those emissions. No point source emissions except from those listed in permit. Limits not to be exceeded.	No point source discharges to air, water or land associated with the waste. Other emissions to air, such as those associated with combustion of fuel, may be subject to the Clean Air Act. Discharge to sewer requires a trade effluent consent (or entry to a Trade Effluent Agreement) with the statutory sewerage undertaker (i.e. water company).	Discharge to sewer requires a trade effluent consent (or entry to a Trade Effluent Agreement) with the statutory sewerage undertaker (i.e. water company).
Transfers off-site	Records of all the wastes sent off site from the activities, for either disposal or recovery to be maintained.	Duty of Care requirements.	

Topic Area	Current requirements for sites subject to EPR-IPPC on the basis of: treatment of non-hazardous waste for <u>disposal</u> in facilities with a capacity > 50 tonnes per day.	Current requirements for sites subject to EPR-waste on the basis of: treatment of non-hazardous waste for <u>recovery</u> in facilities with a capacity > 50 tonnes per day.	Current requirements for sites subject to EPR-waste exemptions on the basis of: treatment of non-hazardous waste for <u>recovery</u> in facilities with a capacity > 50 tonnes per day.
Fugitive emissions	<p>Fugitive emissions shall not cause pollution, including a fugitive emissions management plan where appropriate.</p> <p>All liquids, whose emission to water or land could cause pollution, shall be provided with secondary containment, unless the operator has used other appropriate measures to prevent or where that is not practicable, to minimise, leakage and spillage from the primary container.</p>	<p>Fugitive emissions shall not cause pollution, including a fugitive emissions management plan where appropriate.</p> <p>Buildings for waste treatment shall be maintained under negative pressure and fitted with extraction systems with relevant physical control (e.g. bio-filters).</p> <p>Waste is stored and treated on an impermeable surface with sealed drainage system.</p> <p>All liquids, whose emission to water or land could cause pollution, shall be provided with secondary containment, unless the operator has used other appropriate measures to prevent or where that is not practicable, to minimise, leakage and spillage from the primary container.</p>	Groundwater Regulations.
Groundwater	<p>No emission from activities into groundwater of any substance in List I (in Groundwater Regulations).</p> <p>No emission from activities into groundwater of any substance in List II (in Groundwater Regulations) so as to cause pollution.</p>		
Odour	Prevention or minimisation of annoyance from odour, including an odour management plan where appropriate.	Statutory Nuisance – local council have the authority to limit or stop activities if they are causing a nuisance.	
Noise & Vibration	Prevention or minimisation of annoyance from noise and vibration, including a noise and vibration management plan where appropriate.	Statutory Nuisance – local council have the authority to limit or stop activities if they are causing a nuisance.	

Topic Area	Current requirements for sites subject to EPR-IPPC on the basis of: treatment of non-hazardous waste for <u>disposal</u> in facilities with a capacity > 50 tonnes per day.	Current requirements for sites subject to EPR-waste on the basis of: treatment of non-hazardous waste for <u>recovery</u> in facilities with a capacity > 50 tonnes per day.	Current requirements for sites subject to EPR-waste exemptions on the basis of: treatment of non-hazardous waste for <u>recovery</u> in facilities with a capacity > 50 tonnes per day.
Monitoring	<p>Monitoring of parameters set out in permit, maintaining records and submitting data to the competent authority.</p> <p>Monitoring equipment, techniques, personnel and organisations employed for the emissions monitoring programme to have either MCERTS certification or MCERTS accreditation unless otherwise agreed in writing.</p> <p>Permanent means of access shall be provided to enable sampling/monitoring to be carried out in relation to the emission points.</p> <p>Collection of site reference data identified in the site protection and monitoring programme.</p>	No requirement.	No requirement.
Information			
Records	Provision of records to the competent authority in legible manner.		No requirement.
Reporting	Reporting to the competent authority in accordance with permit requirements and competent authority requests.		No requirement.
Notifications	Notifications to the competent authority.	Notifications to the competent authority.	Annual notification of exemption renewal.
Source of information			
	Environment Agency EPR-IPPC bespoke permit template.	Environment Agency EPR-waste standard permits.	Includes Environment Agency EPR-waste exemption application form and the NetRegs website.

4.3 Environmental issues

This section identifies the main environmental issues for EPR-waste/exempt exempt operations and is based on the IPPC SGN S5.06¹¹, which identifies issues for operators previously entering into the EPR-IPPC regime.

Accident risk

Accident risk is inherent when dealing with waste. Wastes are heterogeneous in nature and are often intrinsically aggressive to plant and equipment. Any failure in the management of the waste, from the process of characterisation and checking of wastes, to operational control for reactions and mixing of wastes, will significantly increase the risk from unwanted or runaway reactions. Combinations of inappropriate equipment and poor inspection and maintenance procedures also increase the accident risk through, for example, tank overflow situations where level indicators may not be working or have not been correctly calibrated.

Relationship to BAT

Treatment for recovery has traditionally competed with disposal via landfill as a management option for many wastes. The requirements of IPPCD and the Landfill Directive will result in waste treatment activities being directed by the need for regulatory compliance and higher standards of environmental protection, and therefore may require significant adjustment by the industry. An assessment of the appropriate measures including BAT will be needed to support any application.

Waste hierarchy

Both IPPCD and the WFD require that appropriate measures be taken against pollution and specifically that the production of waste is avoided. Where waste is produced, the WFD requires that waste be recovered, re-used or used as a source of energy in preference to disposal.

With regard to the waste treatment activities involving recovery this raises the question of whether these activities constitute the appropriate means of dealing with the waste. Clearly, where an opportunity for higher value recovery of a waste exists, then lower value recovery treatment may not be the appropriate measure.

¹¹ Sector Guidance Note IPPC S5.06 Guidance for the Recovery and Disposal of Hazardous and Non Hazardous Waste

Waste characterisation, sampling and checking

The rigour with which these aspects are conducted is essential to waste management operations. Failure to screen waste samples adequately prior to acceptance and to confirm the composition on arrival at the installation has historically led to subsequent problems, which include inappropriate storage and mixing of incompatible substances, accumulation of wastes and unexpected treatment characteristics. Operators would therefore be required to demonstrate that these activities will be carried out rigorously to ensure their effectiveness.

Selection of appropriate treatment techniques

In assessing the treatment options, the effectiveness of the technique in delivering high value recovery and rendering substances suitable for release to other processes must be considered.

For the waste sector in particular, because of the variable and complex composition of many waste streams, not only primary hazards but also secondary hazards must be considered. Techniques should be designed and operated to avoid deliberate or inadvertent production and/or displacement of substances that may be harmful to the environment and to prevent the transfer of such substances from one environmental medium to another.

However, it is also recognised that, to be viable, commercial waste treatment facilities must deal with variable waste streams, and it would not always be desirable or effective to over complicate the design and operation of a waste treatment process. Any determination of BAT cannot be simply seen as a means of implementing the highest available levels of technology.

Merchant waste treatment has to deal with a wide and variable range of wastes. This requires plant and equipment that is versatile and can be used for a number of wastes. This contrasts with treatment techniques used for “in-house” treatment on producer premises, where the number of waste streams is limited and well characterised. This may lend itself to the development of dedicated single-stream treatment techniques.

Accumulations of waste

Failure to ensure adequate throughput of wastes has led to the storage of large numbers of waste containers on some sites. Wastes involved are typically unchecked and containers are left to deteriorate. Such situations are often associated with large-scale site clearances and can be accompanied by competitive pressures and customer insistence to accept additional waste streams. Typically the wastes involved are difficult to handle and/or treat and may have been transferred between various operators, with a consequent loss of information relating to original producer and composition. Under the IE(IPPC)D the operator would be required to demonstrate the efficient and effective processing of waste. A new requirement

will be the need to have measures to identify a suitable disposal or recovery route prior to acceptance.

Summary of emissions

A summary of typical emissions from waste treatment for recovery activities are provided in Appendix A.

Emissions to sewer

Most waste treatment installations have a sewer connection for the emission of aqueous effluents. Consents to discharge are set (in most cases) by sewerage undertakers. Although the consents limit the amount of pollutants dependent on the receiving STW, this can allow the release of significant quantities of pollutants. Historically, the discharge consent has effectively set the standards for the emitting activities. However, this emphasis should change under the IE(IPPC)D, where emissions are determined by applying BAT to reach the most effective standard of pollution control.

Consequently, if on-site treatment can achieve a higher level of removal of a substance from the aqueous effluent than may be required by the sewer discharge consent, on-site treatment should be used. The effect of a third-party waste water treatment plant may be taken into account when determining the emission limit values to be applied to releases to sewer from the installation provided that an equivalent level of protection of the environment as a whole is guaranteed and taking such treatment into account does not lead to higher levels of pollution.

Odour associated with fugitive emissions

The handling of any substance that is or may contain odorous substances, such as mercaptans or other sulphur-containing compounds, will potentially lead to odour noticeable beyond the installation boundary, even at concentrations that may be well below benchmark emission limit values (ELV). Odours may arise from storage, transfer or bulking up of wastes containing odorous substances. Failure to adequately inspect and maintain plant and equipment is also a contributory cause to fugitive emissions, e.g. leaks from pumps.

Site restoration (prevention of emissions to land)

The IE(IPPC)D in common with EPR-waste requires that, on completion of activities, there should be no pollution risk from the site. Like EPR-waste, prevention of both short and long-term contamination of the site requires the provision and maintenance of surfacing of operational areas, measures to prevent or quickly clear away leaks and spillages, maintenance of drainage systems and other subsurface structures. The main difference

between this sector and other sectors is that the condition of the land is considered from when the original licence was issued, not from when the permit is issued.

Number of installations

The following sections identify the number of installations affected by the proposed IE(IPPC)D for each of the business and activity sectors identified in Section 1.2.3, above.

The following assumptions apply throughout section 0:

- Data presented is for facilities treating over 50 tonnes per day of non-hazardous waste for recovery.
- Facilities already regulated under EPR-IPPC are already covered by the IPPCD and so are assumed to undertake treatment for disposal. These sites are not therefore affected by the proposed IE(IPPC)D and receive no further consideration within this report.
- Facilities regulated under EPR-waste or associated exemptions are not currently covered by IPPCD and so it is assumed that they are undertaking treatment for recovery. These site would potentially be affected by the proposed IE(IPPC)D and are included in this report.

4.3.1 Water sector physico-chemical and biological treatment

Sludge treatment techniques

The water companies undertake treatment of water (for drinking) and sewage. These processes are not covered by the IPPCD or the proposed IE(IPPC)D. However, these core business activities in turn generate water treatment and sewage treatment sludges. The processes (listed below) used by the water companies to treat water treatment and sewage treatment sludges are potentially subject to IPPCD and the proposed IE(IPPC)D:

- Biological treatment – anaerobic and aerobic digestion;
- Physico chemical treatment:
 - Centrifuging
 - Liming
 - Drying
 - Thickening
 - Settlement
 - Belt press

Sludge Treatment Centres (STCs)

Sludge is generated at the individual water and sewage treatment works (STWs). The sludges are then transferred to centralised sludge treatment centres (STCs). Following treatment, the majority of treated sludge is recovered principally through landspreading for agricultural benefit, but also through energy recovery. At a relatively small number of works the treated sludge is sent for disposal, primarily through landfilling and incineration; these sites are already subject to EPR-IPPC permits. Water UK estimate that implementation of the IE(IPPC)D proposals would capture something in the order of 500 extra STCs if the regime is extended to include waste treatment for recovery for plant with a capacity > 50 tonnes per day.

Sewage Treatment Works (STWs)

In addition to the centralised STCs discussed above, all STWs will undertake some basic form of simple sludge treatment such as dewatering or gravity thickening. Many of these STWs will 'treat' more than 50 tonnes per day of wet sludge. These STW-generated sludges that are treated on site are not currently captured under any form of regulation as they are defined as an 'excluded waste' under the Environmental Permitting Regulations 2007.

If the IE(IPPC)D proposals are implemented for recovery the deciding factor as to whether 'in situ' STW sludge treatment is covered by the IE(IPPC)D depends on the interpretation adopted by the competent authorities as to whether sludge treatment outside of STCs is relevant. There is considerable uncertainty on this position. If the 'excluded waste' status is rescinded then the number of sites affected by the IE(IPPC)D proposals becomes a question of identifying STWs with sufficient capacity to treat greater than 50 tonnes per day of sludge.

This assessment has been made on the basis that such waste would not be excluded from the proposed IE(IPPC)D changes.

Water UK has suggested a simple model to identify a practical threshold that can be used to identify relevant sites based on STW population equivalent (PE). Assuming a 1% dry solids content of the inputs to a STW, a daily input of 5,000 m³ would result in wet sludge production of 50 tonnes/day (assuming 100 g dry solids / head / day). Assuming that the relationship between STW input volumes and population equivalent (PE) is 1 PE : 1m³, then all STWs greater than 5,000 PE undertaking basic sludge treatment (gravity settling, dewatering valves, etc.) would be captured as an EPR-IPPC activity. It is assumed that all of these STWs currently send their sludge for recovery and so would be affected by the IE(IPPC)D proposals.

Slightly different assumptions to identify a practical threshold can be used to identify relevant sites based on STW PE. The assumptions are that the inputs to a STW have 2% dry solids

content, and a daily input of $\sim 10,000 \text{ m}^3$, resulting in wet sludge production of 50 tonnes/day (assuming 65 g dry solids / head / day). Again assuming that the relationship between STW input volumes and PE is 1 PE : 1 m^3 , then all STWs greater than 10,000 PE undertaking basic sludge treatment (gravity settling, dewatering valves, etc.) would be captured as an EPR-IPPC activity.

An unpublished Ofwat document provided by Dŵr Cymru Welsh Water on the distribution of STWs in size categories suggests that in England and Wales alone there are 719 STWs > 10,000 PE. It is assumed that all of these STWs currently send their sludge for recovery and so would be affected by the IE(IPPC)D proposals.

The Environment Agency has commented that the relationship between STW input volumes and PE is in the order of 3-4 PE : 1 m^3 , which would effectively raise the PE threshold for STWs being captured under the IE(IPPC)D proposals. Having independently reviewed the judgements of stakeholders through Entec's civil engineering division, we estimate that the relationship between STW input volumes and PE could be assumed to lie in the range 2-4 PE : 1 m^3 . Given the variability in other possible assumptions (e.g. dry solid content of incoming effluent) it seems reasonable to assume that STWs serving > 10,000 PE would be captured under the IE(IPPC)D proposals.

Other factors introducing uncertainty

Other factors that may affect the findings of the assessment, albeit to a lesser extent, relate to:

- Frequency of STW sludge thickening / dewatering;
- Identifying the number of sites associated with the treatment of sludge from clean water treatment.

Frequency of STW sludge thickening / dewatering: Most STWs do not dewater sludge on a daily basis. It is therefore possible that STWs serving < 10,000 PE may have the physical capacity to hold / 'treat' more than 50 tonnes per day sludge, though the throughput of the plant may be substantially less.

Treatment of clean water treatment sludge: In addition to wastewater treatment works, the proposals could also potentially affect clean water treatment works which are not currently regulated (unless disposing of sludge), depending on Environment Agency's interpretation. These works can generate sludge waste from on-site physico-chemical treatment, which is then discharged to sewer or is caked and spread to land. These figures have been estimated by industry to be in the range of 50-100 currently operating under an EPR-waste permit that may be treating 50 tonnes or more of sludge per day.

Summary of data provided by Water UK and the water companies

Table 4.7 summarises stakeholder estimates of the number of installations potentially captured by the non-hazardous waste proposals in the proposed IE(IPPC)D.

Table 4.7 Estimated number of installations involved in water sector biological and physico-chemical treatment of sludges potentially captured by IE(IPPC)D

Treatment of non-hazardous waste in facilities with a capacity > 50 tonnes per day.	Company A	Company B	Company C	Company D	Company E	Company F	Company G	Company H	Company I	Company J	Water UK
Sewage STC											
EPR-waste permits	0	0	27	0	4		7	3		15	500
EPR-waste exemptions	36	19	0	42	37	15	102	32-37	25-30	82	
Water STC											
EPR-waste permits	6	-	-	-	-	-	-	-	-	-	-
EPR-waste exemptions	-	-	-	-	-	-	-	-	-	-	-
STW											
Water UK STW size threshold for IE(IPPC)D: STWs serving > 5,000 PE ^[1]	80-90	11	-	176 ^[2]	95	-	360 ^[3]	120	75-80 ^[2]	146 ^[2]	1150
This assessment STW size threshold for IE(IPPC)D: STWs serving > 10,000 PE ^[2]	53	11	-	121	68	-	78	96	51	79	719

Table notes

- 1 Unless otherwise stated, number of STWs serving > 5,000 PE and > 10,000 PE derived from unpublished OFWAT document provided by Dŵr Cymru Welsh Water on the distribution of STWs in size categories.
- 2 Data directly from operator.
- 3 Data from Water UK.

4.3.2 Waste management sector biological treatment

The following activities are considered to represent the main types of installations that would be affected by the non-hazardous waste treatment proposals in the IE(IPPC)D.

- Composting;
- Mechanical biological treatment (MBT), usually in associated with anaerobic digestion;
- Other biological treatment processes.

The table below identifies the number of waste management biological treatment facilities with a capacity exceeding 50 tonnes per day.

Table 4.8 Additional installations under IE(IPPC)D involved in waste sector biological treatment

Type of treatment	EPR-waste	EPR-waste exemption
Composting	28* ^[1]	130 ^[4]
MBT with anaerobic digestion	16 ^[2]	No data
Unspecified biological treatment	26 ^[3]	No data

* Data for England and Wales only.

Notes:

- 1 The Environment Agency's Regis database identifies 202 EPR-waste permits for composting sites in England and Wales, although does not discern between sites above and below the 50 tonnes per day treatment threshold. The Composting Association identifies that there are 157 'PAS 100' registered sites (PAS 100 is a quality assurance system) and provides data on annual throughput. It has been assumed that an annual throughput greater than 18,250 tonnes per year is broadly equivalent to a daily treatment capacity of 50 tonnes per day. On this basis there are 28 composting sites that would be covered by the IE(IPPC)D proposals.
- 2 A Defra report (2007) "Mechanical Biological Treatment of Municipal Solid Waste" identifies that there are 7 MBTs in the UK with a further 9 planned. It is assumed that all of these plants will be operational by 2014 and due to the nature of the process have a daily capacity exceeding 50 tonnes per day.
- 3 The Environment Agency identifies 105 EPR-waste permits for unspecified biological treatment sites in England and Wales, although does not discern

between sites above and below the 50 tonnes per day treatment threshold. Based on characteristics of the composting sector (i.e. a large number of smaller operators) it has assumed that a relatively low proportion (25%) would exceed the 50 tonnes per day IE(IPPC)D threshold.

- 4 Information provided by Defra for this project has identified that there are 1,344 EPR-waste exemptions for composting in England and Wales. Based on characteristics of the composting sector (i.e. a large number of smaller operators) it has assumed that a relatively low proportion (10%) would exceed the 50 tonnes per day IE(IPPC)D threshold.

4.3.3 Waste management sector physico-chemical treatment

The following activities are considered to represent the main types of installations that would be affected by the non-hazardous waste treatment proposals in the IE(IPPC)D.

- Treating and sorting same type of waste for the purposes of recovery;
- Physical treatment;
- Physico-chemical treatment;
- Chemical treatment.

The table below identifies the number of waste treatment physico-chemical treatment facilities with a capacity exceeding 50 tonnes per day.

Table 4.9 Additional installations under IE(IPPC)D involved in waste sector physical and chemical treatment*

Type of treatment	EPR-waste	EPR-waste exemption
Installations sorting and treating wastes for purpose of recovery	86 ^[1]	591 ^[2]
Physical treatment	306 ^[3]	No data
Physico-chemical treatment	89 ^[3]	No data
Chemical	26 ^[3]	No data

*Data for England and Wales only

Notes:

- 1 The Environment Agency's Regis database identifies 86 EPR-waste permits for sites in England and Wales, although does not discern between sites above and

below the 50 tonnes per day treatment threshold. However, experience of the sector suggests that all of these sites operate above threshold.

- 2 WRAP (2007, Business Growth Report - Analysis of MSW Capacity in the UK) identify 2,383 such installations in the UK, of which 28% are identified as exceeding the > 50 tonnes per day threshold. It has been assumed that all EPR-waste permits are in England and Wales with the remainder of sites operating under paragraph 11 exemptions.
- 3 The Environment Agency's Regis database identifies 26 EPR-waste permits in England and Wales undertaking physical treatment, physico-chemical treatment and chemical treatment. The Regis data does not discern between sites above and below the 50 tonnes per day treatment threshold. However, experience of the sector suggests that the majority all of these sites operate above this threshold and therefore all are considered to be affected by the proposed IE(IPPC)D.

4.3.4 Pre-treatment for co-incineration

Energy from waste (EfW) is a growing field in the UK, with a number of facilities now operating to produce refuse derived fuel (RDF) and solid recovered fuel (SRF), the terms used when referring to the outputs from a pre-treatment for co-incineration facility. Pre-treatment for co-incineration may take place either at the site where the co-incineration will take place or off-site.

Incineration is interpreted to be a *disposal* activity as the calorific value recovered from wastes used in this fashion is less than the calorific value input required to burn the waste. In contrast, co-incineration is interpreted to be *recovery* whereby the calorific value derived from the waste is more than the calorific value input required to burn the waste. It is therefore likely that some facilities undertaking pre-treatment for co-incineration do not currently need and EPR-IPPC permit. The various potential regulatory situations are summarised below:

- If the pre-treatment takes place at the same site as the co-incineration then this will already be captured under EPR-IPPC as a directly associated activity (DAA) and so the proposed IE(IPPC)D will have no effect for these sites.
- Offsite pre-treatment of waste using heat is already captured under EPR-IPPC in the UK as a Section 5.5 A(1)(a) activity covering the production of fuel from waste and so the proposed IE(IPPC)D will have no effect for these sites.
- Offsite pre-treatment of waste for co-incineration without the use of heat does not currently require an EPR-IPPC permit. There is no EPR-waste exemption available for such operations so all such facilities should be regulated under an EPR-waste permit. The techniques used for pre-treatment typically include physical treatment (primary pulveriser; rotary screen; air classifier; secondary shredder; pelletiser) or MBT. Data on EPR-waste provided by the Environment Agency, and discussed in Sections 4.3.2 and 4.3.3, will therefore already include these sites.

In conclusion, it has not been possible to identify the number of installations specifically associated with pre-treatment for co-incineration that would be affected by the IE(IPPC)D proposals. However, these facilities are incorporated into the estimated number of sites for waste management biological and physicochemical treatment.

4.3.5 Treatment of slags and ashes

Treatment of slags and ashes is undertaken to facilitate their recovery as aggregate and typically involves physico-chemical treatment in the form of grading, grinding or washing. Although not covered by the IPPCD, such activities are captured in the UK under EPR-IPPC as a Section 3.5 B(a) activity. As a 'Part B' activity these sites are currently regulated by the local authorities, who apply a BAT-based permitting system for emissions to air. EPR-IPPC permits for these activities do not cover other aspects covered by the IPPCD such as emissions to water, land, energy efficiency and so forth.

Information on the number of sites regulated by the local authorities under EPR Section 3.5 B(a) was not readily available.

The Defra 2006-07 survey of local authority regulated sites¹² identifies that there are 1,617 'other minerals' sites in England and Wales. The vast majority of these sites will be associated with the management of other aggregate materials such as concrete or roadstone rather than slags and ashes. This position is reinforced by feedback received from a leading provider of treatment facilities to the major steelworks in the UK, which has six sites directly owned and operated in the UK, all of which were confirmed to be EPR-IPPC (Part B) permitted already.

On this basis it is considered that there may be something in the order of 10-20 sites regulated under EPR-IPPC (Part B) in the UK undertaking the treatment of slags and ashes, however this range is associate with a high degree of uncertainty.

4.3.6 Treatment of scrap metal

The following activities are considered to represent the main types of installations that would be affected by the non-hazardous waste treatment proposals in the IE(IPPC)D.

- Vehicle dismantlers. This does not include end of life vehicles (ELV) facilities as the depollution of vehicles involves hazardous waste (e.g. waste oils, lead acid batteries).
- WEEE facilities not involving hazardous wastes.

¹² Defra (2007), Local Pollution Control Statistical Survey 2006/07: A Survey of Local Authorities in England and Wales by the Department for Environment, Food and Rural Affairs and the Welsh Assembly Government.

- Metal recycling sites.

The table below identifies the number of metal treatment facilities with a capacity exceeding 50 tonnes per day. This data has not been disaggregated by capacity or throughput therefore it is difficult to get a true perception of the potential implications of the proposed changes of the IE(IPPC)D on the industry. The figures represent our best estimates, based on industry and regulatory opinion together with supporting data available in April 2008. There remains a degree of uncertainty around the actual number of installations that will be affected.

Table 4.10 Number of installations involved in the treatment of scrap metal likely to fall under IE(IPPC)D*

Type of treatment	EPR-waste	EPR-waste exemption
Vehicle dismantlers (excluding ELV sites)	788 ^{#[1a]}	0 ^[1b]
WEEE facilities	5 ^[2a]	0 ^[2b]
Metal recycling facilities	168 ^[3]	167 ^[3]

* Data provided by Defra appears to conflict with data from the Environment Agency's Regis database. For the purposes of this report the data from Regis has been used as it was download in April 2008 and is considered to be the most recent available.

England and Wales only

Note 1a The Environment Agency's Regis database identifies 788 EPR-waste permits for vehicle dismantler sites in England and Wales, although does not discern between sites above and below the 50 tonnes per day treatment threshold. In the absence of intelligence on capacity of EPR-waste permitted depolluting sites and using the worst-case scenario, it has been assumed that all of the 788 EPR-waste permitted sites have the capacity to treat >50 tonnes per day although in reality the figure may be much lower.

Note 1b The exemption threshold is treatment of 40 cars per week. Based on an average vehicle weight of 1142kg¹³, the maximum treatment capacity under the exemption is 45.68 tonnes, which would mean it is unlikely that any exempt vehicle dismantlers would be captured by the proposals.

¹³ Source BERR, 2002 - <http://www.berr.gov.uk/files/file30652.pdf>

- Note 2a The Environment Agency's Regis database identifies 5 EPR-waste permits for WEEE sites in England and Wales, although does not discern between sites above and below the 50 tonnes per day treatment threshold. Although, experience of the sector suggests that not all of these sites would operate above the IE(IPPC)D threshold it seems reasonable to assume that there may be five such sites across the UK.
- Note 2b The relevant paragraph exemption only applies to treatment of < 5 tonnes per day of WEEE. Therefore the IE(IPPC)D proposals would not apply to any of the facilities that are currently EPR-waste exempt.
- Note 3 The BMRA was contacted to provide a view on the likely number of installations that may be affected by the proposed changes. In April 2008, it carried out a survey of its 280 scrap metal recycling members in the UK. Of these members, 470 sites were identified of which 335 (71%) across the UK were deemed as likely to treat over 50 tonnes of material per day, consequently falling within the scope of the proposed IE(IPPC)D. Estimates from BMRA and Defra as part of the Exemptions Review indicate that approximately half (50%) of all the members operate under waste-exemptions and therefore the figure of 335 has been split equally between EPR-waste and EPR-waste exemption.

4.4 Summary

4.4.1 Regulation

The installations affected by the IE(IPPC)D proposals are facilities treating non-hazardous waste for recovery at facilities with a capacity greater than 50 tonnes per day. These sites are not currently subject to EPR-IPPC Part A regulation, but are regulated under the following regimes:

- Biological and physico-chemical treatment: Operations are covered by the WFD. Facilities in the UK are EPR-waste regulated either under an EPR-waste permit or an exemption.
- Treatment of slags and ashes: emission to air only. EPR-IPPC Part B, BAT-based regulation for
- Pre-treatment for co-incineration: Operations are covered by the WFD. Facilities in the UK are EPR-waste regulated either under an EPR-IPPC permit or an permit.
- Treatment of scrap metal: Operations are covered by the WFD. Facilities in the UK are regulated either under an EPR-waste permit or an

EPR-waste

exemption.

4.4.2 Additional measures for compliance with the IE(IPPC)D

The table below summarises the additional measures that would be required for non-hazardous waste treatment recovery sites if the IE(IPPC)D proposals were implemented for sites not currently subject to the IPPCD but regulated under:

- EPR-IPPC Part B;
- EPR-waste;
- EPR-waste exemptions.

Table 4.11 Additional measures for non-hazardous waste treatment recovery sites under IE(IPPC)D

EPR-IPPC Part B	EPR-waste	EPR-waste exemptions
<ul style="list-style-type: none"> ▪ Raw materials / resource efficiency / waste hierarchy ▪ Waste pre-acceptance and acceptance procedures ▪ Closure and decommissioning ▪ Site protection and monitoring ▪ BAT based emission limits for discharges to sewer, surface water and land. ▪ Fugitive emissions control including: <ul style="list-style-type: none"> – waste stored and treated on an impermeable surface with sealed drainage system – liquids provided with secondary containment or appropriate measures to prevent / minimise leakage and spillage from the primary container. ▪ Extended reporting requirements. 	<ul style="list-style-type: none"> ▪ Operating process techniques to meet BAT ▪ Raw materials / resource efficiency / waste hierarchy ▪ BAT based emission limits for discharges to air, sewer and surface water and land. ▪ Monitoring to MCERTs standards and provision of sampling access. ▪ Extended reporting requirements. 	<ul style="list-style-type: none"> ▪ Management ▪ Accident management plan ▪ Operating process techniques to meet BAT ▪ Raw materials / resource efficiency / waste hierarchy ▪ Waste pre-acceptance and acceptance procedures ▪ Closure and decommissioning ▪ Site protection and monitoring ▪ BAT based emission limits for discharges to air, sewer and surface water and land. ▪ Fugitive emissions control including: <ul style="list-style-type: none"> – extracted ventilation of buildings – waste stored and treated on an impermeable surface with sealed drainage system – liquids provided with secondary containment or appropriate measures to prevent / minimise leakage and spillage from the primary container. ▪ Monitoring to MCERTs standards and provision of sampling access. ▪ Introduction of reporting requirements.

4.4.3 Number of installations

The table below summarises the potential number of sites that could be affected by the IE(IPPC)D proposals for the disposal and recovery of non-hazardous wastes at a facility with a capacity greater than 50 tonnes per day. It should be noted that due to limitations in data availability there is considerable uncertainty regarding the exact number of installations likely to be affected by the proposals within the IE(IPPC)D.

Table 4.12 Summary of approximate number of installations affected by the IE(IPPC)D proposals and measures required to implement BAT

Treatment for recovery activities > 50 tonnes per day		EPR IPPC Part B	EPR-waste	EPR-waste exemption
Water sector physico-chemical and biological treatment	Sewage STCs	0	50 - 75	425 - 500
	Water STCs	0	50 - 100	0
	STWs	0	0	[1]
Waste management sector biological treatment	Composting	0	25 - 50	125-150
	MBT with anaerobic digestion	0	25 - 50	No data
	Unspecified biological treatment	0	25 - 50	No data
Waste management sector physico-chemical treatment	MRF	0	75 - 100	600
	Physical	0	300	No data
	Physico-chemical	0	75 - 100	No data
	Chemical	0	25	No data
Pre-treatment for co-incineration		Incorporated above under waste management sector biological treatment and physico-chemical treatment		
Treatment of slags and ashes		10-20	0	0

Treatment for recovery activities > 50 tonnes per day		EPR IPPC Part B	EPR-waste	EPR-waste exemption
Treatment of scrap metal	Vehicle dismantlers (excluding ELV sites)	0	788	0
	WEEE facilities	0	5-10	0
	Metal recycling facilities	0	168	167
Totals (low estimate)		10	1611	2017^[2]
Totals (high estimate)		20	1816	2617^[2]

Note [1]: There are estimated to be an additional 700-1200 STWs that treat sludge from the main works that are listed in the EP Regulations as 'excluded waste' and therefore are not currently subject to regulatory control. For the purposes of this assessment, the impact of the proposed IE(IPPC)D changes on these installations have been assumed to be broadly similar to these for an EPR-waste exempt site.

Note [2]: The total figures include the estimated 700-1200 STWs detailed in Note [1].

5. Costs

5.1 Approach - non-hazardous waste treatment for recovery

Compliance costs for the non-hazardous waste treatment installations that may be affected by the proposed changes to include treatment for recovery (as well as pre-treatment for co-incineration, treatment of slags and ashes, and treatment of scrap metal) have been estimated based on discussions with relevant stakeholders (for example, Water UK) and published information on the potential measures that may be required and their associated costs. However, the non-hazardous waste treatment sector is so diverse that there is considerable uncertainty in the data developed as part of this assessment.

5.2 Administrative costs

5.2.1 Operators

Operations currently regulated under EPR-IPPC Part B

For those operators already permitted under Part B, the administrative costs required to obtain a Part A permit when the Directive has been adopted into the UK are greater than present but less than for exempt premises. The additional administrative cost that may be incurred by existing Part B operators has been outlined below;

Changing from a Part B permit to a Part A(2):

- Subsistence costs (annual):
 - subsistence charge (£1,383-£1,065 = £318 additional cost to the operator);
 - time for record keeping, inventory preparation, staff training and inspections (approximately £400 for Part B – Part A unknown).

A decision on who will regulate the proposed new IPPCD installations is likely only to be made after the revised Directive has been adopted.

Operations currently regulated under EPR-waste and EPR-waste exemptions

Under the Environmental Permitting Regulations, some waste recovery / treatment facilities would be classed as tier 3 facilities, which means they are regarded as being more complex and high risk facilities that require a more detailed and individually-tailored permit. The associated costs for application submission fees and annual subsistence charges for these installations will therefore be based on the relevant permit application charge multiplier for

that facility, multiplied by the relevant Operational Risk Appraisal (Opra) charging score for that facility. Based on the 2008/2009 figures the permit application charge multiplier is £195 and the subsistence charge multiplier is £94.

Administrative costs for operators¹⁴ can be broken down into two main elements each of which can be further sub-divided:

- Permit application (one-off):
 - permit application fee (£4,500-£20,000)
 - time and costs to prepare the permit and carry out associated investigations (assumed to vary between £13,500 - £150,000);
- Subsistence costs (annual):
 - subsistence charge (£5,000-£15,000)
 - time for record keeping, inventory preparation, staff training and inspections (may be up to 10 f.t.e. days per year (equivalent to around £1,800¹⁵).
- Surrender charge (one-off) - £640

Capital (one-off) costs have been annualised over the lifetime of a permit (assumed to be 20 years in line with Defra, 2006) with a discount rate of 3.5%.

5.2.2 Regulators

It can be assumed that the permit fees and subsistence charges paid by operators through the Opra charging scheme would be sufficient to cover regulators' costs for the processing of the permit and ongoing enforcement.

5.2.3 Results for administrative costs

Administrative costs would be incurred by the non-hazardous waste treatment sites through permit application and subsistence costs as the proposed IE(IPPC)D changes includes sites which have previously not been regulated under the IPPCD regime. In some instances these sites may have been covered by the EPR-IPPC Part B, EPR-waste or EPR-waste exemptions. IPPC costs are expected to be higher due to the move to a higher charging 'tier' within the regulators' charging systems.

¹⁴ Indicative administrative cost data range is a combination of research and data provided by water industry companies.

¹⁵ Based on an hourly cost of £21.05 in 2004 prices (using the Better Regulation Executive's Standard Cost Model), inflated to January 2008 prices based on the Retail Price Index and assuming 7.5 working hours per day.

For the current 10-20 Part B permitted installations, they are already required to pay costs for subsistence so conversion to Part A would result in annualised capital costs of between £12,500 and £25,000 and annual costs of between £7,000 and £13,500 resulting in a total annual administrative cost of between £19,500 and £38,500.

The administrative costs associated with the proposed change to non-hazardous waste treatment for recovery for EPR-waste and EPR-waste exempt installations are based on a range of affected installations as detailed in Table 4.12. The results are summarised in the Tables 5.1 and 5.2 below.

Table 5.1 Administrative costs (low range estimate – 3628 installations)

Cost element	Unit cost (£/installation)		Annualised capital costs (£)		Annual costs (£/year)	
	Low	High	Low	High	Low	High
Operators						
Permit application fees	£4,500	£20,000	£1,148,715	£5,105,400	-	-
Permit application time costs	£13,500	£150,000	£3,446,145	£38,290,498	-	-
Subsistence fees	£5,000	£15,000			£5,000	£15,000
Subsistence time costs	£900	£1,800			£900	£1,800
Surrender costs	£640	£640	-	-	£2,321,920	£2,321,920
<i>Sub-Total</i>	<i>£24,540</i>	<i>£187,440</i>	<i>£4,594,860</i>	<i>£43,395,898</i>	<i>£2,327,820</i>	<i>£2,338,720</i>
Regulatory Authorities						
Permit application time costs (regulators)			Assuming costs covered within the application fee			
Subsistence time costs			Assuming costs covered within the application charge			
Sub-Total	N/A	N/A	N/A	N/A	N/A	N/A
Total Costs (annualised + annual)					LOW	HIGH
					£6,922,680	£45,734,618
Note: Permit application time costs, improvement costs and subsistence costs are based on costs for England and Wales.						

Table 5.2 Administrative costs (high range estimate – 4433 installations)

Cost element	Unit cost (£/installation)		Annualised capital costs (£)		Annual costs (£/year)	
	Low	High	Low	High	Low	High
Operators						
Permit application fees	£4,500	£20,000	£1,403,598	£6,238,213	-	-
Permit application time costs	£13,500	£150,000	£4,210,794	£46,786,598	-	-
Subsistence fees	£5,000	£15,000			£5,000	£15,000
Subsistence time costs	£900	£1,800			£900	£1,800
Surrender costs	£640	£640	-	-	£2,837,120	£2,837,120
<i>Sub-Total</i>	<i>£24,540</i>	<i>£187,440</i>	<i>£5,614,392</i>	<i>£53,024,811</i>	<i>£2,843,020</i>	<i>£2,853,920</i>
Regulatory Authorities						
Permit application time costs (regulators)		Assuming costs covered within the application fee				
Subsistence time costs		Assuming costs covered within the application charge				
Sub-Total	N/A	N/A	N/A	N/A	N/A	N/A
Total Costs (annualised + annual)					LOW	HIGH
					£8,457,412	£55,878,731
Note: Permit application time costs, improvement costs and subsistence costs are based on costs for England and Wales.						

5.3 Compliance costs

Compliance costs for the non-hazardous waste recovery installations that may be affected by the proposed IE(IPPC)D changes have been estimated based on discussions with waste and waste management companies, some of whom already hold EPR-IPPC permits for both for installations relevant to this assessment and also for other activities. Prior to the introduction of IPPC, these installations were regulated in the same way as those which potentially may be included with the proposed amendment regarding non-hazardous waste treatment; therefore it is reasonable to assume that the changes that would be required under the proposed IE(IPPC)D and environmental improvements may be similar.

5.3.1 Compliance costs for operators

Compliance costs for operators have been based on the improvements that may be required at non-hazardous waste treatment facilities as a result of a requirement to meet BAT (shown in Table 5.3.)

These are based on the improvement conditions previously required for UK installations. The potential future requirements that may apply through the development of BAT for the non-hazardous waste treatment installations may or may not be similar to these.

Table 5.3 Potential improvements required to implement BAT at installations affected by the IE(IPPC)D proposals

Improvement	EPR-IPPC Part B	EPR-waste	EPR-waste exemption
Review treatment process against BAT and undertake improvements.	x	✓	✓
Review resource efficiency / use of the waste hierarchy against BAT and undertake improvements.	✓	✓	✓
Develop an environmental management system	x	x	✓
Waste pre-acceptance and acceptance procedures.	✓	✓	✓
Develop an accident management plan	x	x	✓
Proposals to be developed for providing secondary containment, or other appropriate measures, to prevent, or where that is not practicable, to minimise leakage and spillage from primary pipe work including drains, sumps, storage and treatment vessels in relation to their risk of causing pollution	✓	x	✓
Development of proposals for a monitoring programme for the detection of leaks from the surface and subsurface infrastructure including tanks, sumps, pumps, pipework, hardstanding and the drainage system.	✓	✓	✓
Development of a written report detailing the condition of the installations drainage which includes reviewing the condition of drains and developing a detailed drainage plan	✓	x	✓
Develop a site closure plan	✓	✓	✓
Develop a site protection and monitoring	✓	✓	✓

Improvement	EPR-IPPC Part B	EPR-waste	EPR-waste exemption
Proposals to be developed for providing sampling access for monitoring discharges to air, surface waters and sewer.	x	✓	✓
Monitoring	✓	✓	✓
Review odour emissions and develop an odour management plan where there are deficiencies.	✓	x	✓
Review noise and vibration emissions and develop a noise and vibration management plan where there are deficiencies.	✓	x	✓

The costs associated with improvements that may be required have been researched using a combination of industry consultation, desk-based assessment and consultancy experience working within the field of industrial IPPC improvement programmes. Given the level of uncertainty surrounding the costs, ranges have been adopted to reduce the uncertainty. The cost ranges provided in Table 5.4 have been informed by best estimates based on discussions with a number of industry stakeholders supported by Entec's consultancy expertise in the sector. In the case of the water industry, costs have been provided by the industry themselves.

Table 5.4 Cost range for potential improvements^[1]

Improvement	Capital cost	Annual cost
Review treatment process against BAT and undertake improvements.	£5,000 – £50,000	-
Review resource efficiency / use of the waste hierarchy against BAT and undertake improvements.		
Develop an environmental management system	£5,000 - £10,000	£500 - £1,000
Waste pre-acceptance and acceptance procedures.		
Develop an accident management plan	£2,000 - £10,000	-

Improvement	Capital cost	Annual cost
<p><u>Water Treatment Industry only</u></p> <p>Proposals to be developed for assessing the requirement for and if necessary provision of secondary containment, or other appropriate measures, to prevent, or where that is not practicable, to minimise leakage and spillage from primary pipe work including drains, sumps, storage and treatment vessels in relation to their risk of causing pollution.</p> <p>Development of proposals for a monitoring programme for the detection of leaks from the surface and subsurface infrastructure including tanks, sumps, pumps, pipework, hardstanding and the drainage system.</p>	£50,000 - £10million ^[2]	£25,000 - £75,000 ^[3]
<p><u>Other affected industries</u></p> <p>Proposals to be developed for assessing the requirement for and if necessary provision of secondary containment, or other appropriate measures, to prevent, or where that is not practicable, to minimise leakage and spillage from primary pipe work including drains, sumps, storage and treatment vessels in relation to their risk of causing pollution.</p>	£5,000 - £50,000	£500 – £5,000
Development of a written report detailing the condition of the installations drainage which includes reviewing the condition of drains and developing a detailed drainage plan	£2,000 - £5,000	£500 - £1,000
Develop a site closure plan	£2,000 - £5,000	-
Develop a site protection and monitoring programme	£5,000 - £30,000	-
Proposals to be developed for providing sampling access for monitoring discharges to air, surface waters and sewer.	£5,000	-
Monitoring	-	£1,000 - £10,000
Review odour emissions and develop an odour management plan where there are deficiencies.	£2,000 - £5,000	£500 - £1,000
Review noise and vibration emissions and develop a noise and vibration management plan where there are deficiencies.	£5,000	£1,000 - £2,000

Note 1 Costs for all improvements have been developed on the basis of estimated man-days effort (at £250 cost per man-day) plus estimated capital cost of purchasing equipment and equipment necessary to undertake and maintain efficiency.

- Note 2 Stakeholder operators have indicated that the cost for introducing secondary containment would be in the order of £10s millions. However, this depends on the outcome of initial assessment (estimated at a capital cost of £50,000) as well as the complexity of the STC and STW. For water companies, any expenditure of this nature would need to be agreed with Ofwat in advance. This figure includes £5,000 of capital costs estimated for development of leak-monitoring and detection programme at each site.
- Note 3 A range of costs have been identified by UK water companies to undertake annual assessments of tank integrity. Estimates ranged from £44,000 - £10+ million. The lower range of the estimate is based on costs provided by a water company to Ofwat for assessing secondary containment for treatment plant already captured under the IPPCD because the wastes are disposed of rather than recovered. The upper estimate reflects other costs to the company, particularly at larger STCs and STWs where plant may have to be taken off-line to undertake the assessment. The high costs reflect issues in managing the sewage and sludge during such periods rather than that for the assessment survey alone. However, it is not clear what potential there is for assessing tank integrity during periods of planned maintenance (thus avoiding / reducing business interruption costs); how frequently the assessments would be needed; what techniques could be applied (which could involve less process interruption); and how representative the very high costs would be. Therefore, without further supporting information, we have not included the very high quoted costs in this assessment.

Detailed compliance costs for operators

Using the information from the table above and also BAU for installations affected by the IE(IPPC)D proposals (see Table 4.3.4 and Table 4.1112) compliance costs have been estimated for each affected sector. Detailed analysis is presented in a series of tables in Appendix B. A summary of the total costs is presented in Table 5.5.

Separate compliance cost data associated with pre-treatment for co-incineration has not been presented as these treatment sectors are assumed to be captured under biological and physico-chemical treatment.

Table 5.5 Estimated Total Compliance Costs – All Sectors

Cost Element	Affected installations	Annual Costs (£/unit)		Annualised Capital Costs		Total Costs	
		Low	High	Low	High	Low	High
Water Sector Biological and Physico-Chemical Treatment (EPR-Waste Permits)	100-175	£28,500	£90,000	£51,012	£292,438	£126,012	£1,254,938
Water Sector Biological and Physico-Chemical Treatment (EPR-Exemptions)	425-1200	£28,500	£90,000	£1,460,784	£429,913,215	£7,708,284	£489,793,215
Waste Management Sector Biological Treatment (EPR-Waste Permits)	75-150	£4,000	£20,000	£72,560	£804,755	£128,810	£1,929,755
Waste Management Sector Biological Treatment (EPR-Exemptions)	125-150	£4,000	£20,000	£222,957	£1,126,657	£516,707	£3,211,657
Waste Management Sector Physico-Chemical Treatment (EPR-Waste Permits)	475-525	£4,000	£20,000	£459,546	£2,816,642	£815,796	£6,754,142
Waste Management Sector Physico-Chemical Treatment (EPR-Exemptions)	600	£4,000	£20,000	£1,070,192	£4,506,627	£2,480,192	£12,846,627
Treatment of Slags and Ashes (Part B Permits)	10 to 20	£4,000	£20,000	£16,394	£182,939	£41,394	£522,939
Treatment of Scrap Metal (EPR-Waste Permits)	966	£4,000	£20,000	£1,070,509	£5,522,465	£2,278,009	£13,733,465
Treatment of Scrap Metal (EPR-Exemptions)	167	£4,000	£20,000	£256,744	£1,019,339	£548,994	£2,338,639
Total				£4,680,697	£446,185,076	£14,644,197	£532,385,376
<p>These costs are indicative estimates based on consultation and internal expert judgment. Total annualised costs are estimated based on installations affected and the proportion affected Total annualised costs are estimated using a discount rate of 3.5% over a 20 year lifetime which is consistent with the HM Treasury Green book</p>							

5.4 Results summary

5.4.1 Administrative costs

The administrative costs of the regulatory authorities are assumed to be covered by the fees and charges levied. The wide range of costs represents uncertainties regarding the number of installations, costs of preparing a permit and the charges likely to be levied for the type of installation under the Environment Protection Operator Pollution Risk Appraisal (EP-OPRA) scheme. This gives a total administrative cost (for operators of installations brought under IPPC regulation and regulatory authorities) in the following approximate range **£6,900,000 to £55,500,000**.

5.4.2 Compliance costs

The estimated total cost of compliance with IPPC for operators potentially captured by the proposed IE(IPPC)D changes have been estimated to be in the approximate range £14 million and £532 million. There is likely to be greater financial burdens for operators currently under EPR-waste exemption as there are likely to be a wider range of compliance activities required than for those operators currently under EPR-waste permits.

6. Benefits

The following table summarises the benefits likely to be achieved from capturing non-hazardous waste treatment for recovery under the IE(IPPC)D proposals. Due to lack of available information it is not possible to quantify the benefits.

Table 6.1 Benefits

Benefits	Situation under IE(IPPC)D	Business as Usual (BAU)
Waste reduction, minimisation and resource efficiency	All IPPC permits include standard conditions designed to address waste reduction, minimisation and resource efficiency.	The existing EPR-IPPC (Part B), EPR-waste permits and exemptions do not contain conditions to address waste reduction, minimisation and resource efficiency.
Reduction in pollution	<p>IPPC permits issued to non-hazardous waste recovery treatment plants may be expected to contain improvement conditions designed to reduce pollution, such as:</p> <ul style="list-style-type: none"> ▪ Leak detection and possibly secondary containment ▪ Assessment of environmental impact ▪ Odour management plans 	<p>Noise and odour will be currently regulated by the local authority as Statutory Nuisance. Odour control is already subject to a Defra Code of Practice and is reported to be easily enforceable.</p> <p>Leak detection and secondary containment is currently only addressed for facilities regulated under EPR-waste. There are no requirements to address these issues for EPR-IPPC Part B permits or EPR-waste exemptions.</p> <p>Under EPR-waste permits, there should already be a requirement for no point source emissions to air, water or land.</p>
Formalisation of environmental management systems	IPPC permits include standard conditions designed to require the operators to implement and maintain a management system, organisational structure and allocate resources that are sufficient to achieve compliance with the limits and conditions of the permit.	<p>EPR-waste exemptions do not require formal environmental management systems.</p> <p>Equivalent requirements are already in place for EPR-IPPC Part B permits and EPR-waste permits.</p>
Prevention of accidents and minimisation of their consequences	IPPC permits contain standard conditions requiring the maintenance and implementation of an accident management plan.	<p>EPR-waste exemptions do not require formalisation of environmental management systems.</p> <p>Equivalent requirements are already in place for EPR-IPPC Part B permits and EPR-waste permits.</p>

Non-hazardous waste recovery treatment facilities can affect the environment if the recovery techniques do not recover the most value from the waste being treated. The purpose of waste recovery activities is to reduce the consumption of natural resources, both in terms of the materials being recovered and also the 'embedded' water and energy originally required to create the original product. If the waste treatment process does not produce a quality product the opportunities for recovering value through waste treatment is very much diminished.

The main impact of the proposed changes would be a reduction in fugitive emissions, however due to limited information available from the stakeholders, BREF documents and EA guidance it is not possible to quantify this. Physically identical non-hazardous waste

disposal plants (covered by the IPPCD) currently permitted under EPR-IPPC are investigating the feasibility of leak detection and secondary containment in line with BAT requirements relating to storage of waste within bulk storage vessels. These investigations are still in the preliminary stages and therefore based on the information obtained to date, it has not been possible to determine:

- The extent of leakage from the existing non-hazardous waste treatment sites; and
- The damage that any leaks may have on the environment.

This current work is in relation to sludge containment at STWs and the perceived “negative” impact of uncontrolled leaks/spills of sludge to land is deemed questionable by the waste water treatment companies, as sludge to agricultural land for ecological benefit is the dominant sludge disposal route.

In relation to the water sector non-hazardous waste treatment, the environmental impact of the leak is dependant on the nature of the waste water. Other installations identified within this report may treat more complex non-hazardous wastes.

If secondary containment is deemed to be required then there may be a need for replacement of the whole asset in the event that secondary containment cannot be retrofitted. At present, there is a lack of clarity surrounding the extent to which such measures could be retrofitted and in reality many facilities may not require full asset replacement. In addition, contingency measures may need to be brought in for the treatment of the wastewater, which will place a further cost-burden on the water industry.

It has not been able to quantitatively estimate benefits of reduced environmental impacts in quantitative or monetary terms due to a lack of information on the substances likely to be released and their likely impacts.

6.1 Summary

The application of IPPC requirements to the installations that may be affected by a change to the IPPC Directive with the inclusion of non-hazardous waste treatment for recovery could potentially lead improvements in resource efficiency, reductions in fugitive emissions, including odour and reduced incidents of ground and water pollution from leaks and spillages. However due to the absence of data it is not possible to quantify this.

7. Competition Assessment

The competition guidelines (August 2007)¹⁶ set out four main questions, in order to ascertain whether the proposed policy (revisions in the IPPCD) would affect the market by:

1. Directly limiting the number or range of suppliers?
2. Indirectly limiting the number or range of suppliers?
3. Limiting the ability of suppliers to compete?
4. Reducing suppliers' incentives to compete vigorously?

A brief summary of the four questions are presented below in Table 7.1 and for those where the answer to one of the questions is "Yes", then an explanation is provided in the following sections.

The results should be included in the "Evidence Base" within the Impact Assessment template.

Table 7.1 Summary of the competition test

Question	Water sector physico-chemical and biological treatment	Waste management sector physico-chemical and biological treatment	Pre-treatment for co-incineration	Treatment of slags and ashes	Treatment of scrap metal
Q1. Directly limit the number or range of suppliers?	No*	No*	No*	No*	No*
Q2. Indirectly limit the range of suppliers?	No	No	No	No	Yes
Q3. Limit the ability of suppliers to compete?	No	No	No	No	No

¹⁶ http://www.ofst.gov.uk/shared_ofst/reports/comp_policy/ofst876.pdf

Question	Water sector physico-chemical and biological treatment	Waste management sector physico-chemical and biological treatment	Pre-treatment for co-incineration	Treatment of slags and ashes	Treatment of scrap metal
Q4. Reduce suppliers' incentives to compete vigorously?	No	No	No	No	No

* For installations above the threshold an IPPC permit will be required. The requirement for a permit could directly limit the number of installations although the cost is unlikely to be significant enough to restrict the number of suppliers. This is explained further below.

7.1 Water sector physico-chemical and biological treatment

Water companies are natural monopolies, because it is not possible for more than one company to survive and benefit from economies of scale (based on current infrastructure). This generally means they have the ability to set prices rather than being a price taker. In the UK each region has one water company and a limited number of treatment sites. Therefore sludge treatment plants are not necessarily competing with another treatment plants to provide a better or cheaper service, especially if all the treatment plants in the area are owned by the same company. In some instances where there are different treatment installations not owned by the same company (e.g. an independent treatment plant), there may be more competition over price, but the possibility of transporting treatment material to another site will be limited to distances where the inclusion of transportation costs makes it cheaper to treat the material at the nearest site.

The water companies are however regulated by OWFAT to ensure; an adequate supply, good quality of water and at a good value to consumers. In theory the water company can pass on the costs of IE(IPPC)D legislation to its customers if it can be justified to OWFAT. However if they are unable to pass on costs, this may lead to a redistribution of expenditure with spending elsewhere reduced (e.g. on infrastructure) which may ultimately reduce the value offered to consumers and the general public.

7.2 **Waste management sector physico-chemical and biological treatment**

Historically, the UK has been reliant on landfill for waste disposal. However legislation such as the EU landfill Directive, national and local authority targets require substantial reductions in the amount of waste being landfilled and increases in the amounts of wastes recovered. The non-hazardous waste must be treated before it is recovered (e.g. used for composting, spreading on land, used in anaerobic digesters).

Waste treatment recovery is more capital intensive than landfill due to the processing facilities required. For municipal waste treatment services private companies often enter into long term contracts with local authorities to build the facility and then treat the waste for a given number of years. One reason for this is to ensure that the high sunk costs (costs that can not be recovered) associated with building treatment sites can be offset by having a guaranteed stream of revenue over a given number of years.

The industry is typically dominated by larger private sector companies who are able to supply integrated waste management services (e.g. collection, treatment and disposal). In most regions of the UK a single firm (private company or a local authority waste disposal company (LAWDC)) would have exclusive supply of waste within a region (e.g. a county or several local authorities) and therefore would not be subject to competition from other waste treatment plants during the term of the contract.

Therefore these firms should be able to pass on the costs of IPPC through higher fees when they are tendering to win the contract. However some contractors may already be operating on a fixed variable charge (e.g. a fixed £/t received) and therefore may not be able to pass on the costs until the contract can be re-negotiated or re-tendered during procurement (this will depend on the terms in the contract as some may be able to pass these costs on if they are beyond the environmental standards set out in the contract). However given that the proposed revisions to the IPPCD would not come into effect until 2014 it is likely that most new (or recent) contracts and prices will be (or have been) adjusted to incorporate the costs of IPPC permits.

7.3 **Pre-treatment for co-incineration**

Co-incineration is the use of waste as an additional fuel to generate energy or material products. It is gaining popularity because conventional fossil fuels are becoming increasingly expensive and generate carbon dioxide (and other harmful emissions such as SO₂, NO_x and PM), and in many countries waste disposal options are limited. Several industrial sectors use co-incineration including the cement industry, power plants and firing

installations, the pulp and paper industry, iron and steel production, the non-ferrous metals industry and the chemical industry (Economic and Social Council 2001¹⁷).

Many types of wastes can be used for co-incineration including plastics, used tyres, sewage sludge and other residues from water treatment, residues and rejects from the pulp and paper industry, residues from wood processing, waste oil/petrol coke, and solvents. These waste products need to be pre-treated and converted into a form that is suitable for co-incineration (this may vary for different users).

Pre-treatment installations for co-incineration are already compliant with EPR-waste regulation (with no exemptions) and therefore additional costs of compliance with IPPC regulation (e.g. additional permitting, administrative, energy efficiency costs etc) should not be significantly high. Therefore for many installations the costs of IPPC will be mitigated. The ability to pass on any additional costs is discussed below.

The economic feasibility of using waste fuel depends on several factors, although the main factors are likely to be; the cost of conventional fossil fuels and the cost and level of emissions reductions required vs. the cost of pre-treated “ready to burn” waste fuel and the savings and level of emissions that could be achieved. This typically means that it is only economically viable to purchase treated waste fuel from nearby suppliers, thus restricting competition to a regional level (once you have taken into account the cost of transportation).

Therefore in practice affected installations treating waste may be able to pass through the costs by charging a higher gate fee (i.e. a fee to accept the waste) or charge co-incineration plants a higher fee for the pre-treated and “ready to burn” fuel source due to the market being restricted to a regional level.

However this may encourage users of co-incineration to pre-treat and convert waste material into a “ready to burn” fuel source onsite rather than pay the higher cost (it should also be noted that some pre-treatment plants may already have an IPPC permit and therefore there maybe no change in price). It could also discourage waste co-incineration as compared to other forms of fuels.

It will also depend on the ability of installations below the threshold (and therefore unaffected by the proposed changes to the IPPCD) to supply a greater quantity of “ready to burn” waste for co-incineration and still stay below the threshold. If they are able to supply to a greater market this may deter larger installations affected by IPPC to not pass on the costs of IPPC to avoid losing their market share. It may also encourage new entrants to enter below the threshold (or encourage a downscaling of capacity to below the threshold) to avoid the cost of IPPC permits and attempt to gain a significant market share due to being able to charge a

¹⁷ <http://www.incineration.info/files/publications/7.pdf>

lower price (or at least have lower costs). It should be noted that a number of smaller companies may not necessarily be as efficient as a larger capacity installation and therefore may result in a less efficient use of resources. However there is currently insufficient data to determine whether this scenario could occur.

7.4 **Treatment of slags and ashes**

Installations treating slags and/or ashes are already compliant with EPR part B (IPPC) (with no exemptions) and therefore additional costs of compliance with IPPC regulation (e.g. additional permitting, administrative, energy efficiency costs etc) should not be significantly high. Therefore for many installations the costs of IPPC will be mitigated. The ability to pass on any additional costs is discussed below.

Both slag and fly ash have many uses and as a by-product have a significant market value (although not high enough to be exposed to import penetration). Some power plants already have an IPPC permit for treatment of fly ash and so there will be no additional costs of the proposed revisions of the IPPC legislation. Slag is typically sold to pre-treatment installations who then sell the treated slag to construction companies and so forth. Therefore it may be possible for many installations that are affected by proposed revisions to IPPC to be able to pass on the costs to their customers. However it will be important to take into consideration that these products also compete against products such as lime and therefore in some instances it may not be possible to pass on costs.

7.5 **Treatment of scrap metal**

In section 4.3.6 it was suggested that around 70% of the members of the British Metals Recycling Association would be affected by the proposals (those above the proposed threshold limit). A possible direct consequence could be that less scrap metal will be produced due to installations exiting the market, which could occur for small and medium sized enterprises that currently just exceed the threshold. A more likely scenario could be that these installations will now have an incentive to reduce capacity below the threshold value to avoid the cost of the IPPC regime. This is considered likely because continuing global price increases in scrap metals over the last few years should make it viable for these plants to continue to produce scrap metals without fully being able to exploit the benefits of economies of scale. Given the short timescales of the project, it is not possible to determine whether this will necessarily give them a competitive advantage in price due to the loss in benefits from economies of scale that larger installations benefit from.

For larger installations given the higher value of scrap metals the costs of IPPC may not necessarily result in companies exiting the market (or necessarily deter new entrants to enter the market) although if it is not possible for them to pass on the costs of IPPC compliance, this may, for example, result in a reduced return to companies providing them with scrap

metals and products that have scrap value (e.g. cars) and/or companies no longer providing free collections.

8. Limitations and Uncertainties

The following are considered to be the main limitations and uncertainties associated with this assessment:

- Assumptions regarding how the regulators would implement the requirements of the IE(IPPC)D.
- Uncertainties in the estimation of the number of installations potentially affected by the proposed IE(IPPC)D.
- Uncertainties in the costs involved for operators in compliance with the requirements of the IE(IPPC)D.
- Lack of quantitative data on the benefits to the UK from the proposed IE(IPPC)D.

8.1 Implementation of the IE(IPPC)D

It has been assumed that the UK government will apply the proposed IPPC Directive changes in line with current arrangements for IPPC, namely division into:

- EPR-IPPC Part A:
 - activities covered by the IE(IPPC)D and UK BAT-based regulation
- EPR-IPPC Part B:
 - activities not covered by the IE(IPPC)D but are covered by UK BAT-based regulation
- EPR-waste:
 - operations covered by the WFD but not the IE(IPPC)D
- EPR-waste exempt:
 - operations covered by the WFD but exempt from the requirement to obtain a permit

8.2 Number of installations

There are a diverse range of installations for treatment of non-hazardous waste for recovery. This assessment has identified some 4,665 - 5,480 installations that could potentially be affected by the IE(IPPC)D proposals. There are two factors which introduce uncertainty into estimating installation numbers, specifically:

- Assumptions regarding industry structure
- Lack of data on the number of EPR-waste exemptions that may exceed the 50 tonnes per day threshold.

8.2.1 Assumptions regarding industry structure

Many of the sources of information used to identify the number of installations potentially affected by the IE(IPPC) proposals, such as the Environment Agency Regis database or data from trade associations, do not categorise sites according to daily treatment capacity. For example, EPR-waste exemptions are based on a threshold for annual throughput. Although this can be converted to a daily throughput, this is not directly equivalent to treatment capacity because averaging throughput over the year is likely to underestimate the number of sites with high capacity but relatively low throughput.

Other sources of data can only provide information on the total number of a particular type of treatment site in the UK with no quantitative data on capacity or throughput being available.

In such circumstances, Entec have used our professional experience of the industry sector to make assumptions regarding the size (capacity) distribution of facilities. For example, the Environment Agency's Regis database identifies 86 EPR-waste permits for MRFs in England and Wales, although does not discern between sites above and below the 50 tonnes per day treatment threshold. However, experience of the sector suggests that all of these sites are likely to operate above the 50 tonnes per day treatment capacity threshold.

8.2.2 EPR-waste exemptions numbers

Entec was unable to identify the number of EPR-waste exemptions for a number of treatment activities, including:

- Waste management sector biological treatment:
 - MBTs with anaerobic digestion
- Waste management sector physico-chemical treatment:
 - Physical treatment
 - Physico-chemical treatment
 - Chemical treatment

This is one of the largest uncertainties in this assessment, given that for other treatment activities the identified number of EPR-waste exemptions was relatively high (e.g. over 1,000 exemptions per assessment category).

8.3 **Uncertainties on compliance costs for operators**

Many of the stakeholders contacted as part of this assessment were unable to provide costs for the implementation of the proposed IE(IPPC)D. Where possible, Entec has made estimates of potential costs based on our professional experience for undertaking such work.

The assessment has identified a relatively high number of installations that would be affected by the proposed IE(IPPC)D. As noted in the previous section, there is some uncertainty regarding this number, which in turn affects the total costs identified in the assessment.

8.4 **Lack of quantitative data on benefits**

It was not possible to quantify or monetarise the potential benefits of implementing the proposed IE(IPPC)D. In part this is due to the highly variable nature of the facilities covered by the proposals, but also because the main benefits are achieved by better implementation of the waste hierarchy (and so improved resource efficiency) and reduction in fugitive emissions.

Appendix A

Typical emissions from non-hazardous waste treatment for recovery

Water sector physico-chemical and biological treatment

The table below summarises the typical emissions that would be expected from facilities undertaking the biological and physico-chemical treatment of non-hazardous sewage and water treatment sludges.

Table A1 Typical emissions from biological and physico-chemical treatment of non-hazardous sewage and water treatment sludges

Biological treatment (anaerobic digestion)			Physico-chemical treatment		
Air	Controlled waters	Land	Air	Controlled waters	Land
Odours	Suspended solids	Waste residues to landfill disposal.	Odours	Suspended solids	Waste residues to landfill disposal.
VOCs	Heavy metals	Sludge spreading onto land.	Dust	Heavy metals	Sludge spreading onto land.
Oxides of nitrogen	Ammoniacal-nitrogen		VOCs	Ammoniacal-nitrogen	
Carbon dioxide	BOD		Oxides of nitrogen	BOD	
Hydrogen sulphide	COD			COD	
Methane	Trace metals			Trace metals	

Waste management sector biological treatment

The table below summarises the typical emissions that would be expected from facilities undertaking the biological treatment of non-hazardous waste. The emissions data has been compiled from the SEPA guidelines for mechanical biological treatment and anaerobic digestion¹⁸ and the decision document from Aberdeenshire Council Boyndie composting facility¹⁹.

¹⁸ SEPA. http://www.sepa.org.uk/pdf/nws/promotion/Anaerobic_Digestion.pdf. Available on 22nd May 2008

¹⁹ SEPA. http://www.sepa.org.uk/pdf/ppc/ppd/archive/PPC-A/1004323/final_decis.pdf. Available on 22nd May 2008

Table A2 Typical emissions from biological treatment facilities²⁰

Compost			Anaerobic digestion			Mechanical biological treatment		
Air	Controlled waters	Land	Air	Controlled waters	Land	Air	Controlled waters	Land
Micro-organisms Dust Odour VOCs Bioaerosols	Untreated waste water – abatement through bunding, drainage collection and hard standing should be in place	Litter	Odours VOCs Oxides of nitrogen Methane Bioaerosols	Untreated waste water – abatement through bunding, drainage collection and hard standing should be in place	Litter	Micro-organisms Dust VOCs Odours (hydrogen sulphide) Carbon dioxide	Untreated waste water – abatement through bunding, drainage collection and hard standing should be in place	Litter

8.4.1 Waste management sector physico-chemical treatment

The following table summarises the typical emissions that would be expected from facilities undertaking the physical and chemical treatment of non-hazardous waste. The emissions data was abstracted from the Waste Awareness Wales Fact sheet 7 and Environment Agency guidance²¹,

²⁰ Dr Mark Broomfield on behalf of Surrey County Council Environment and Economy Select Committee. *Health risks of waste management facilities*. [http://www.surreycc.gov.uk/sccwebsite/sccwspublications.nsf/b129973b443de13e80256c670041a50e/1e9895c925f0f1488025715700297b96/\\$FILE/Mark%20Broomfield%20-%20Enviros.pdf](http://www.surreycc.gov.uk/sccwebsite/sccwspublications.nsf/b129973b443de13e80256c670041a50e/1e9895c925f0f1488025715700297b96/$FILE/Mark%20Broomfield%20-%20Enviros.pdf). Available on 2nd May 2008.

²¹ Environment Agency. http://www.environment-agency.gov.uk/commondata/acrobat/sr20_1854448.pdf. Available on 22nd May 2008

Table A3 Emissions from physical and chemical treatment facilities

Material Recovery Facilities (MRF) ²²			Physico-chemical treatment facility		
Air	Controlled waters	Land	Air	Controlled waters	Land
Dust Odour Noise Litter Bioaerosols Carbon dioxide	None – hardstanding and drainage collection should be in place	Litter Residues for disposal to landfill	Dust Odour Noise	Suspended solids Heavy metals Ammoniacal-nitrogen BOD COD Trace metals	Litter Mud Residues for disposal to landfill

Pre-treatment for co-incineration

Emissions associated with pre-treatment for co-incineration arise from biological, physical and physico-chemical treatment; the previous tables in this appendix have described these emissions.

Emissions - treatment of slags and ashes

In general there was a lack of data available regarding the treatment processes involved for this sector. One company identified the main environmental impact as particulates. Given that the sites are often co-located on heavy industrial sites, the issue relating to noise was not considered an issue by virtue of the assumed low sensitivity of the location and the absence of noise sensitive receptors.

Work completed as part of the Commission’s review of the IPPCD²³ estimated that dust emissions could be around 100t per million tonnes of slag treated. Across the EU emissions of dust could potentially be reduced by a factor of 10 by bringing these installations within the scope of the IE(IPPC)D. However, emissions to air from such sites are already regulated

²² SEPA. *Materials Recovery Facility*. http://www.sepa.org.uk/pdf/nws/planning/leaflets/mat_recovery.pdf. Available on 2nd May 2008.

²³ Data gathering and impact assessment for a review and possible widening of the scope of the IPPC Directive in relation to waste treatment activities. Fact sheet E4-Off-site treatment installations for slag and ashes for recycling. Final report by VITO and BIO, with Institute for European Environmental Policy and IVM, 2007.

under a BAT-based permitting system so it is unlikely that the proposals would reduce emissions in the UK for this sector.

Emissions - treatment of scrap metal

The following table summarises the typical emissions that would be expected from facilities undertaking the recycling of scrap metal.

Table A4 Emissions from scrap metal facilities²⁴

ELV facility	WEEE facility	Vehicle dismantler	Metal recycling site
Particulates, hydrogen chloride, cadmium and lead (as metals), VOCs and hydrocarbons, dioxins and PCBs			

²⁴ http://www.ehsni.gov.uk/gnb2-2_pdf.pdf. Available on 2nd May 2008.

Appendix B Cost Estimate Tables

Table B.1 - Low-Range Estimated Compliance Costs for Water Sector (Biological and Physico-Chemical Treatment) **EPR-Waste Permitted Sites**

Cost Element	Affected installations	Proportion affected (%)	Capital cost (£/unit)		Annual cost (£/unit)		Total annualised capital cost (£)		Total annual cost (£)	
			Low	High	Low	High	Low	High	Low	High
Review treatment process / resource efficiency and undertake improvements	100	10%	£5,000	£50,000	-	-	£3,518	£35,181	£3,518	£35,181
Develop an EMS (including waste acceptance procedures)	100	0%	£5,000	£10,000	£500	£1,000	£0	£0	£0	£0
Develop an accident management plan	100	0%	£2,000	£10,000	-	-	£0	£0	£0	£0
Secondary containment, or other control measures, assessment and provision (if necessary)	100	0%	£50,000	£10,000,000	£25,000	£75,000	£0	£0	£0	£0
Drain integrity survey & report	100	50%	£2,000	£5,000	£500	£1,000	£7,036	£17,590	£32,036	£67,590
Development of a site closure plan	100	100%	£2,000	£5,000	-	-	£14,072	£35,181	£14,072	£35,181
Development of a Site Protection and Monitoring Programme (SPMP)	100	0%	£5,000	£30,000	-	-	£0	£0	£0	£0
Report on proposals for sampling access for monitoring	100	25%	£5,000	£5,000	-	-	£8,795	£8,795	£8,795	£8,795
On-site monitoring	100	50%	£5,000	£20,000	£1,000	£10,000	£17,590	£70,361	£67,590	£570,361
Review and development of odour management plan	100	0%	£2,000	£5,000	£500	£1,000	£0	£0	£0	£0
Review and development of noise management plan	100	0%	£5,000	£5,000	£1,000	£2,000	£0	£0	£0	£0
Total Cost			£88,000	£10,145,000	£28,500	£90,000	£51,012	£167,108	£126,012	£717,108
These costs are indicative estimates based on consultation and internal expert judgment.										
Total annualised costs are estimated based on installations affected and the proportion affected										
Total annualised costs are estimated using a discount rate of 3.5% over a 20 year lifetime which is consistent with the HM Treasury Green book										

Table B1.2 - High-Range Estimated Compliance Costs for Water Sector (Biological and Physico-Chemical Treatment) **EPR-Waste Permitted Sites**

Cost Element	Affected installations	Proportion affected (%)	Capital cost (£/unit)		Annual cost (£/unit)		Total annualised capital cost (£)		Total annual cost (£)	
			Low	High	Low	High	Low	High	Low	High
Review treatment process / resource efficiency and undertake improvements	175	10%	£5,000	£50,000	-	-	£6,157	£61,566	£6,157	£61,566
Develop an EMS (including waste acceptance procedures)	175	0%	£5,000	£10,000	£500	£1,000	£0	£0	£0	£0
Develop an accident management plan	175	0%	£2,000	£10,000	-	-	£0	£0	£0	£0
Secondary containment, or other control measures, assessment and provision (if necessary)	175	0%	£50,000	£10,000,000	£25,000	£75,000	£0	£0	£0	£0
Drain integrity survey & report	175	50%	£2,000	£5,000	£500	£1,000	£12,313	£30,783	£56,063	£118,283
Development of a site closure plan	175	100%	£2,000	£5,000	-	-	£24,626	£61,566	£24,626	£61,566
Development of a Site Protection and Monitoring Programme (SPMP)	175	0%	£5,000	£30,000	-	-	£0	£0	£0	£0
Report on proposals for sampling access for monitoring	175	25%	£5,000	£5,000	-	-	£15,391	£15,391	£15,391	£15,391
On-site monitoring	175	50%	£5,000	£20,000	£1,000	£10,000	£30,783	£123,132	£118,283	£998,132
Review and development of odour management plan	175	0%	£2,000	£5,000	£500	£1,000	£0	£0	£0	£0
Review and development of noise management plan	175	0%	£5,000	£5,000	£1,000	£2,000	£0	£0	£0	£0
Total Cost			£88,000	£10,145,000	£28,500	£90,000	£89,271	£292,438	£220,521	£1,254,938
These costs are indicative estimates based on consultation and internal expert judgment.										
Total annualised costs are estimated based on installations affected and the proportion affected										
Total annualised costs are estimated using a discount rate of 3.5% over a 20 year lifetime which is consistent with the HM Treasury Green book										

Table B1.3 - Low-Range Estimated Compliance Costs for Water Sector (Biological and Physico-Chemical Treatment) **EPR-Exempt Sites**

Cost Element	Affected installations	Proportion affected (%)	Capital cost (£/unit)		Annual cost (£/unit)		Total annualised capital cost (£)		Total annual cost (£)	
			Low	High	Low	High	Low	High	Low	High
Review treatment process / resource efficiency and undertake improvements	425	30%	£5,000	£50,000	-	-	£44,855	£448,552	£44,855	£448,552
Develop an EMS (including waste acceptance procedures)	425	100%	£5,000	£10,000	£500	£1,000	£149,517	£299,035	£362,017	£724,035
Develop an accident management plan	425	50%	£2,000	£10,000	-	-	£29,903	£149,517	£29,903	£149,517
Secondary containment, or other control measures, assessment and provision (if necessary)	425	50%	£50,000	£10,000,000	£25,000	£75,000	£747,586	£149,517,288	£6,060,086	£165,454,788
Drain integrity survey & report	425	50%	£2,000	£5,000	£500	£1,000	£29,903	£74,759	£136,153	£287,259
Development of a site closure plan	425	100%	£2,000	£5,000	-	-	£59,807	£149,517	£59,807	£149,517
Development of a Site Protection and Monitoring Programme (SPMP)	425	100%	£5,000	£30,000	-	-	£149,517	£897,104	£149,517	£897,104
Report on proposals for sampling access for monitoring	425	25%	£5,000	£5,000	-	-	£37,379	£37,379	£37,379	£37,379
On-site monitoring	425	100%	£5,000	£20,000	£1,000	£10,000	£149,517	£598,069	£574,517	£4,848,069
Review and development of odour management plan	425	30%	£2,000	£5,000	£500	£1,000	£17,942	£44,855	£81,692	£172,355
Review and development of noise management plan	425	30%	£5,000	£5,000	£1,000	£2,000	£44,855	£44,855	£172,355	£299,855
Total Cost			£88,000	£10,145,000	£28,500	£90,000	£1,460,784	£152,260,930	£7,708,284	£173,468,430
These costs are indicative estimates based on consultation and internal expert judgment.										
Total annualised costs are estimated based on installations affected and the proportion affected										
Total annualised costs are estimated using a discount rate of 3.5% over a 20 year lifetime which is consistent with the HM Treasury Green book										

Table B1.4 High-Range Estimated Compliance Costs for Water Sector (Biological and Physico-Chemical Treatment) **EPR-Exempt Sites**

Cost Element	Affected installations	Proportion affected (%)	Capital cost (£/unit)		Annual cost (£/unit)		Total annualised capital cost (£)		Total annual cost (£)	
			Low	High	Low	High	Low	High	Low	High
Review treatment process / resource efficiency and undertake improvements	1200	30%	£5,000	£50,000	-	-	£126,650	£1,266,499	£126,650	£1,266,499
Develop an EMS (including waste acceptance procedures)	1200	100%	£5,000	£10,000	£500	£1,000	£422,166	£844,333	£1,022,166	£2,044,333
Develop an accident management plan	1200	50%	£2,000	£10,000	-	-	£84,433	£422,166	£84,433	£422,166
Secondary containment, or other control measures, assessment and provision (if necessary)	1200	50%	£50,000	£10,000,000	£25,000	£75,000	£2,110,832	£422,166,461	£17,110,832	£467,166,461
Drain integrity survey & report	1200	50%	£2,000	£5,000	£500	£1,000	£84,433	£211,083	£384,433	£811,083
Development of a site closure plan	1200	100%	£2,000	£5,000	-	-	£168,867	£422,166	£168,867	£422,166
Development of a Site Protection and Monitoring Programme (SPMP)	1200	100%	£5,000	£30,000	-	-	£422,166	£2,532,999	£422,166	£2,532,999
Report on proposals for sampling access for monitoring	1200	25%	£5,000	£5,000	-	-	£105,542	£105,542	£105,542	£105,542
On-site monitoring	1200	100%	£5,000	£20,000	£1,000	£10,000	£422,166	£1,688,666	£1,622,166	£13,688,666
Review and development of odour management plan	1200	30%	£2,000	£5,000	£500	£1,000	£50,660	£126,650	£230,660	£486,650
Review and development of noise management plan	1200	30%	£5,000	£5,000	£1,000	£2,000	£126,650	£126,650	£486,650	£846,650
Total Cost			£88,000	£10,145,000	£28,500	£90,000	£4,124,566	£429,913,215	£21,764,566	£489,793,215
These costs are indicative estimates based on consultation and internal expert judgment.										
Total annualised costs are estimated based on installations affected and the proportion affected										
Total annualised costs are estimated using a discount rate of 3.5% over a 20 year lifetime which is consistent with the HM Treasury Green book										

Table B1.5 - Low-Range Estimated Compliance Costs for Waste Sector (Biological Treatment) **EPR-Waste Permitted Sites**

Cost Element	Affected installations	Proportion affected (%)	Capital cost (£/unit)		Annual cost (£/unit)		Total annualised capital cost (£)		Total annual cost (£)	
			Low	High	Low	High	Low	High	Low	High
Review treatment process / resource efficiency and undertake improvements	75	10%	£5,000	£50,000	-	-	£2,639	£26,385	£2,639	£26,385
Develop an EMS (including waste acceptance procedures)	75	0%	£5,000	£10,000	£500	£1,000	£0	£0	£0	£0
Develop an accident management plan	75	0%	£2,000	£10,000	-	-	£0	£0	£0	£0
Secondary containment, or other control measures, assessment and provision (if necessary)	75	50%	£5,000	£50,000	£500	£5,000	£13,193	£131,927	£31,943	£319,427
Drain integrity survey & report	75	0%	£2,000	£5,000	£500	£1,000	£0	£0	£0	£0
Development of a site closure plan	75	100%	£2,000	£5,000	-	-	£10,554	£26,385	£10,554	£26,385
Development of a Site Protection and Monitoring Programme (SPMP)	75	100%	£5,000	£30,000	-	-	£26,385	£158,312	£26,385	£158,312
Report on proposals for sampling access for monitoring	75	25%	£5,000	£5,000	-	-	£6,596	£6,596	£6,596	£6,596
On-site monitoring	75	50%	£5,000	£20,000	£1,000	£10,000	£13,193	£52,771	£50,693	£427,771
Review and development of odour management plan	75	0%	£2,000	£5,000	£500	£1,000	£0	£0	£0	£0
Review and development of noise management plan	75	0%	£5,000	£5,000	£1,000	£2,000	£0	£0	£0	£0
Total Cost			£43,000	£195,000	£4,000	£20,000	£72,560	£402,377	£128,810	£964,877
These costs are indicative estimates based on consultation and internal expert judgment.										
Total annualised costs are estimated based on installations affected and the proportion affected										
Total annualised costs are estimated using a discount rate of 3.5% over a 20 year lifetime which is consistent with the HM Treasury Green book										

Table B1.6 High-Range Estimated Compliance Costs for Waste Sector (Biological Treatment) **EPR-Waste Permitted Sites**

Cost Element	Affected installations	Proportion affected (%)	Capital cost (£/unit)		Annual cost (£/unit)		Total annualised capital cost (£)		Total annual cost (£)	
			Low	High	Low	High	Low	High	Low	High
Review treatment process / resource efficiency and undertake improvements	150	10%	£5,000	£50,000	-	-	£5,277	£52,771	£5,277	£52,771
Develop an EMS (including waste acceptance procedures)	150	0%	£5,000	£10,000	£500	£1,000	£0	£0	£0	£0
Develop an accident management plan	150	0%	£2,000	£10,000	-	-	£0	£0	£0	£0
Secondary containment, or other control measures, assessment and provision (if necessary)	150	50%	£5,000	£50,000	£500	£5,000	£26,385	£263,854	£63,885	£638,854
Drain integrity survey & report	150	0%	£2,000	£5,000	£500	£1,000	£0	£0	£0	£0
Development of a site closure plan	150	100%	£2,000	£5,000	-	-	£21,108	£52,771	£21,108	£52,771
Development of a Site Protection and Monitoring Programme (SPMP)	150	100%	£5,000	£30,000	-	-	£52,771	£316,625	£52,771	£316,625
Report on proposals for sampling access for monitoring	150	25%	£5,000	£5,000	-	-	£13,193	£13,193	£13,193	£13,193
On-site monitoring	150	50%	£5,000	£20,000	£1,000	£10,000	£26,385	£105,542	£101,385	£855,542
Review and development of odour management plan	150	0%	£2,000	£5,000	£500	£1,000	£0	£0	£0	£0
Review and development of noise management plan	150	0%	£5,000	£5,000	£1,000	£2,000	£0	£0	£0	£0
Total Cost			£43,000	£195,000	£4,000	£20,000	£145,120	£804,755	£257,620	£1,929,755
These costs are indicative estimates based on consultation and internal expert judgment.										
Total annualised costs are estimated based on installations affected and the proportion affected										
Total annualised costs are estimated using a discount rate of 3.5% over a 20 year lifetime which is consistent with the HM Treasury Green book										

Table B1.7 Low-Range Estimated Compliance Costs for Waste Sector (Biological Treatment) **EPR-Exempt Sites**

Cost Element	Affected installations	Proportion affected (%)	Capital cost (£/unit)		Annual cost (£/unit)		Total annualised capital cost (£)		Total annual cost (£)	
			Low	High	Low	High	Low	High	Low	High
Review treatment process / resource efficiency and undertake improvements	125	30%	£5,000	£50,000	-	-	£13,193	£131,927	£13,193	£131,927
Develop an EMS (including waste acceptance procedures)	125	100%	£5,000	£10,000	£500	£1,000	£43,976	£87,951	£106,476	£212,951
Develop an accident management plan	125	50%	£2,000	£10,000	-	-	£8,795	£43,976	£8,795	£43,976
Secondary containment, or other control measures, assessment and provision (if necessary)	125	30%	£5,000	£50,000	£500	£5,000	£13,193	£131,927	£31,943	£319,427
Drain integrity survey & report	125	50%	£2,000	£5,000	£500	£1,000	£8,795	£21,988	£40,045	£84,488
Development of a site closure plan	125	100%	£2,000	£5,000	-	-	£17,590	£43,976	£17,590	£43,976
Development of a Site Protection and Monitoring Programme (SPMP)	125	100%	£5,000	£30,000	-	-	£43,976	£263,854	£43,976	£263,854
Report on proposals for sampling access for monitoring	125	25%	£5,000	£5,000	-	-	£10,994	£10,994	£10,994	£10,994
On-site monitoring	125	100%	£5,000	£20,000	£1,000	£10,000	£43,976	£175,903	£168,976	£1,425,903
Review and development of odour management plan	125	30%	£2,000	£5,000	£500	£1,000	£5,277	£13,193	£24,027	£50,693
Review and development of noise management plan	125	30%	£5,000	£5,000	£1,000	£2,000	£13,193	£13,193	£50,693	£88,193
Total Cost			£43,000	£195,000	£4,000	£20,000	£222,957	£938,881	£516,707	£2,676,381
These costs are indicative estimates based on consultation and internal expert judgment.										
Total annualised costs are estimated based on installations affected and the proportion affected										
Total annualised costs are estimated using a discount rate of 3.5% over a 20 year lifetime which is consistent with the HM Treasury Green book										

Table B1.8 High-Range Estimated Compliance Costs for Waste Sector (Biological Treatment) **EPR-Exempt Sites**

Cost Element	Affected installations	Proportion affected (%)	Capital cost (£/unit)		Annual cost (£/unit)		Total annualised capital cost (£)		Total annual cost (£)	
			Low	High	Low	High	Low	High	Low	High
Review treatment process / resource efficiency and undertake improvements	150	30%	£5,000	£50,000	-	-	£15,831	£158,312	£15,831	£158,312
Develop an EMS (including waste acceptance procedures)	150	100%	£5,000	£10,000	£500	£1,000	£52,771	£105,542	£127,771	£255,542
Develop an accident management plan	150	50%	£2,000	£10,000	-	-	£10,554	£52,771	£10,554	£52,771
Secondary containment, or other control measures, assessment and provision (if necessary)	150	30%	£5,000	£50,000	£500	£5,000	£15,831	£158,312	£38,331	£383,312
Drain integrity survey & report	150	50%	£2,000	£5,000	£500	£1,000	£10,554	£26,385	£48,054	£101,385
Development of a site closure plan	150	100%	£2,000	£5,000	-	-	£21,108	£52,771	£21,108	£52,771
Development of a Site Protection and Monitoring Programme (SPMP)	150	100%	£5,000	£30,000	-	-	£52,771	£316,625	£52,771	£316,625
Report on proposals for sampling access for monitoring	150	25%	£5,000	£5,000	-	-	£13,193	£13,193	£13,193	£13,193
On-site monitoring	150	100%	£5,000	£20,000	£1,000	£10,000	£52,771	£211,083	£202,771	£1,711,083
Review and development of odour management plan	150	30%	£2,000	£5,000	£500	£1,000	£6,332	£15,831	£28,832	£60,831
Review and development of noise management plan	150	30%	£5,000	£5,000	£1,000	£2,000	£15,831	£15,831	£60,831	£105,831
Total Cost			£43,000	£195,000	£4,000	£20,000	£267,548	£1,126,657	£620,048	£3,211,657
These costs are indicative estimates based on consultation and internal expert judgment.										
Total annualised costs are estimated based on installations affected and the proportion affected										
Total annualised costs are estimated using a discount rate of 3.5% over a 20 year lifetime which is consistent with the HM Treasury Green book										

Table B1.9 Low-Range Estimated Compliance Costs for Waste Sector (Physico-Chemical Treatment) **EPR-Waste Permitted Sites**

Cost Element	Affected installations	Proportion affected (%)	Capital cost (£/unit)		Annual cost (£/unit)		Total annualised capital cost (£)		Total annual cost (£)	
			Low	High	Low	High	Low	High	Low	High
Review treatment process / resource efficiency and undertake improvements	475	10%	£5,000	£50,000	-	-	£16,711	£167,108	£16,711	£167,108
Develop an EMS (including waste acceptance procedures)	475	0%	£5,000	£10,000	£500	£1,000	£0	£0	£0	£0
Develop an accident management plan	475	0%	£2,000	£10,000	-	-	£0	£0	£0	£0
Secondary containment, or other control measures, assessment and provision (if necessary)	475	50%	£5,000	£50,000	£500	£5,000	£83,554	£835,538	£202,304	£2,023,038
Drain integrity survey & report	475	0%	£2,000	£5,000	£500	£1,000	£0	£0	£0	£0
Development of a site closure plan	475	100%	£2,000	£5,000	-	-	£66,843	£167,108	£66,843	£167,108
Development of a Site Protection and Monitoring Programme (SPMP)	475	100%	£5,000	£30,000	-	-	£167,108	£1,002,645	£167,108	£1,002,645
Report on proposals for sampling access for monitoring	475	25%	£5,000	£5,000	-	-	£41,777	£41,777	£41,777	£41,777
On-site monitoring	475	50%	£5,000	£20,000	£1,000	£10,000	£83,554	£334,215	£321,054	£2,709,215
Review and development of odour management plan	475	0%	£2,000	£5,000	£500	£1,000	£0	£0	£0	£0
Review and development of noise management plan	475	0%	£5,000	£5,000	£1,000	£2,000	£0	£0	£0	£0
Total Cost			£43,000	£195,000	£4,000	£20,000	£459,546	£2,548,390	£815,796	£6,110,890
These costs are indicative estimates based on consultation and internal expert judgment.										
Total annualised costs are estimated based on installations affected and the proportion affected										
Total annualised costs are estimated using a discount rate of 3.5% over a 20 year lifetime which is consistent with the HM Treasury Green book										

Table B1.10 High-Range Estimated Compliance Costs for Waste Sector (Physico-Chemical Treatment) **EPR-Waste Permitted Sites**

Cost Element	Affected installations	Proportion affected (%)	Capital cost (£/unit)		Annual cost (£/unit)		Total annualised capital cost (£)		Total annual cost (£)	
			Low	High	Low	High	Low	High	Low	High
Review treatment process / resource efficiency and undertake improvements	525	10%	£5,000	£50,000	-	-	£18,470	£184,698	£18,470	£184,698
Develop an EMS (including waste acceptance procedures)	525	0%	£5,000	£10,000	£500	£1,000	£0	£0	£0	£0
Develop an accident management plan	525	0%	£2,000	£10,000	-	-	£0	£0	£0	£0
Secondary containment, or other control measures, assessment and provision (if necessary)	525	50%	£5,000	£50,000	£500	£5,000	£92,349	£923,489	£223,599	£2,235,989
Drain integrity survey & report	525	0%	£2,000	£5,000	£500	£1,000	£0	£0	£0	£0
Development of a site closure plan	525	100%	£2,000	£5,000	-	-	£73,879	£184,698	£73,879	£184,698
Development of a Site Protection and Monitoring Programme (SPMP)	525	100%	£5,000	£30,000	-	-	£184,698	£1,108,187	£184,698	£1,108,187
Report on proposals for sampling access for monitoring	525	25%	£5,000	£5,000	-	-	£46,174	£46,174	£46,174	£46,174
On-site monitoring	525	50%	£5,000	£20,000	£1,000	£10,000	£92,349	£369,396	£354,849	£2,994,396
Review and development of odour management plan	525	0%	£2,000	£5,000	£500	£1,000	£0	£0	£0	£0
Review and development of noise management plan	525	0%	£5,000	£5,000	£1,000	£2,000	£0	£0	£0	£0
Total Cost			£43,000	£195,000	£4,000	£20,000	£507,919	£2,816,642	£901,669	£6,754,142
These costs are indicative estimates based on consultation and internal expert judgment.										
Total annualised costs are estimated based on installations affected and the proportion affected										
Total annualised costs are estimated using a discount rate of 3.5% over a 20 year lifetime which is consistent with the HM Treasury Green book										

Table B1.11 Estimated Compliance Costs for Waste Sector (Physico-Chemical) **EPR-Exempt Sites**

Cost Element	Affected installations	Proportion affected (%)	Capital cost (£/unit)		Annual cost (£/unit)		Total annualised capital cost (£)		Total annual cost (£)	
			Low	High	Low	High	Low	High	Low	High
Review treatment process / resource efficiency and undertake improvements	600	30%	£5,000	£50,000	-	-	£63,325	£633,250	£63,325	£633,250
Develop an EMS (including waste acceptance procedures)	600	100%	£5,000	£10,000	£500	£1,000	£211,083	£422,166	£511,083	£1,022,166
Develop an accident management plan	600	50%	£2,000	£10,000	-	-	£42,217	£211,083	£42,217	£211,083
Secondary containment, or other control measures, assessment and provision (if necessary)	600	30%	£5,000	£50,000	£500	£5,000	£63,325	£633,250	£153,325	£1,533,250
Drain integrity survey & report	600	50%	£2,000	£5,000	£500	£1,000	£42,217	£105,542	£192,217	£405,542
Development of a site closure plan	600	100%	£2,000	£5,000	-	-	£84,433	£211,083	£84,433	£211,083
Development of a Site Protection and Monitoring Programme (SPMP)	600	100%	£5,000	£30,000	-	-	£211,083	£1,266,499	£211,083	£1,266,499
Report on proposals for sampling access for monitoring	600	25%	£5,000	£5,000	-	-	£52,771	£52,771	£52,771	£52,771
On-site monitoring	600	100%	£5,000	£20,000	£1,000	£10,000	£211,083	£844,333	£811,083	£6,844,333
Review and development of odour management plan	600	30%	£2,000	£5,000	£500	£1,000	£25,330	£63,325	£115,330	£243,325
Review and development of noise management plan	600	30%	£5,000	£5,000	£1,000	£2,000	£63,325	£63,325	£243,325	£423,325
Total Cost			£43,000	£195,000	£4,000	£20,000	£1,070,192	£4,506,627	£2,480,192	£12,846,627
These costs are indicative estimates based on consultation and internal expert judgment.										
Total annualised costs are estimated based on installations affected and the proportion affected										
Total annualised costs are estimated using a discount rate of 3.5% over a 20 year lifetime which is consistent with the HM Treasury Green book										

Table B1.12 Low-Range Estimated Compliance Costs for Waste Sector (Treatment of Slags and Ashes) **EPR-IPPC Part B Sites**

Cost Element	Affected installations	Proportion affected (%)	Capital cost (£/unit)		Annual cost (£/unit)		Total annualised capital cost (£)		Total annual cost (£)	
			Low	High	Low	High	Low	High	Low	High
Review treatment process / resource efficiency and undertake improvements	10	30%	£5,000	£50,000	-	-	£1,055	£10,554	£1,055	£10,554
Develop an EMS (including waste acceptance procedures)	10	10%	£5,000	£10,000	£500	£1,000	£352	£704	£852	£1,704
Develop an accident management plan	10	10%	£2,000	£10,000	-	-	£141	£704	£141	£704
Secondary containment, or other control measures, assessment and provision (if necessary)	10	100%	£5,000	£50,000	£500	£5,000	£3,518	£35,181	£8,518	£85,181
Drain integrity survey & report	10	100%	£2,000	£5,000	£500	£1,000	£1,407	£3,518	£6,407	£13,518
Development of a site closure plan	10	100%	£2,000	£5,000	-	-	£1,407	£3,518	£1,407	£3,518
Development of a Site Protection and Monitoring Programme (SPMP)	10	100%	£5,000	£30,000	-	-	£3,518	£21,108	£3,518	£21,108
Report on proposals for sampling access for monitoring	10	0%	£5,000	£5,000	-	-	£0	£0	£0	£0
On-site monitoring	10	100%	£5,000	£20,000	£1,000	£10,000	£3,518	£14,072	£13,518	£114,072
Review and development of odour management plan	10	30%	£2,000	£5,000	£500	£1,000	£422	£1,055	£1,922	£4,055
Review and development of noise management plan	10	30%	£5,000	£5,000	£1,000	£2,000	£1,055	£1,055	£4,055	£7,055
Total Cost			£43,000	£195,000	£4,000	£20,000	£16,394	£91,469	£41,394	£261,469
<p>These costs are indicative estimates based on consultation and internal expert judgment.</p> <p>Total annualised costs are estimated based on installations affected and the proportion affected</p> <p>Total annualised costs are estimated using a discount rate of 3.5% over a 20 year lifetime which is consistent with the HM Treasury Green book</p>										

Table B1.13 High-Range Estimated Compliance Costs for Waste Sector (Treatment of Slags and Ashes) **EPR-IPPC Part B Sites**

Cost Element	Affected installations	Proportion affected (%)	Capital cost (£/unit)		Annual cost (£/unit)		Total annualised capital cost (£)		Total annual cost (£)	
			Low	High	Low	High	Low	High	Low	High
Review treatment process / resource efficiency and undertake improvements	20	30%	£5,000	£50,000	-	-	£2,111	£21,108	£2,111	£21,108
Develop an EMS (including waste acceptance procedures)	20	10%	£5,000	£10,000	£500	£1,000	£704	£1,407	£1,704	£3,407
Develop an accident management plan	20	10%	£2,000	£10,000	-	-	£281	£1,407	£281	£1,407
Secondary containment, or other control measures, assessment and provision (if necessary)	20	100%	£5,000	£50,000	£500	£5,000	£7,036	£70,361	£17,036	£170,361
Drain integrity survey & report	20	100%	£2,000	£5,000	£500	£1,000	£2,814	£7,036	£12,814	£27,036
Development of a site closure plan	20	100%	£2,000	£5,000	-	-	£2,814	£7,036	£2,814	£7,036
Development of a Site Protection and Monitoring Programme (SPMP)	20	100%	£5,000	£30,000	-	-	£7,036	£42,217	£7,036	£42,217
Report on proposals for sampling access for monitoring	20	0%	£5,000	£5,000	-	-	£0	£0	£0	£0
On-site monitoring	20	100%	£5,000	£20,000	£1,000	£10,000	£7,036	£28,144	£27,036	£228,144
Review and development of odour management plan	20	30%	£2,000	£5,000	£500	£1,000	£844	£2,111	£3,844	£8,111
Review and development of noise management plan	20	30%	£5,000	£5,000	£1,000	£2,000	£2,111	£2,111	£8,111	£14,111
Total Cost			£43,000	£195,000	£4,000	£20,000	£32,788	£182,939	£82,788	£522,939
These costs are indicative estimates based on consultation and internal expert judgment.										
Total annualised costs are estimated based on installations affected and the proportion affected										
Total annualised costs are estimated using a discount rate of 3.5% over a 20 year lifetime which is consistent with the HM Treasury Green book										

Table B1.14 Estimated Compliance Costs for Waste Sector (Treatment of Metals) **EPR-Waste Permitted Sites**

Cost Element	Affected installations	Proportion affected (%)	Capital cost (£/unit)		Annual cost (£/unit)		Total annualised capital cost (£)		Total annual cost (£)	
			Low	High	Low	High	Low	High	Low	High
Review treatment process / resource efficiency and undertake improvements	966	10%	£5,000	£50,000	-	-	£33,984	£339,844	£33,984	£339,844
Develop an EMS (including waste acceptance procedures)	966	0%	£5,000	£10,000	£500	£1,000	£0	£0	£0	£0
Develop an accident management plan	966	0%	£2,000	£10,000	-	-	£0	£0	£0	£0
Secondary containment, or other control measures, assessment and provision (if necessary)	966	50%	£5,000	£50,000	£500	£5,000	£169,922	£1,699,220	£411,422	£4,114,220
Drain integrity survey & report	966	100%	£2,000	£5,000	£500	£1,000	£135,938	£339,844	£618,938	£1,305,844
Development of a site closure plan	966	100%	£2,000	£5,000	-	-	£135,938	£339,844	£135,938	£339,844
Development of a Site Protection and Monitoring Programme (SPMP)	966	100%	£5,000	£30,000	-	-	£339,844	£2,039,064	£339,844	£2,039,064
Report on proposals for sampling access for monitoring	966	25%	£5,000	£5,000	-	-	£84,961	£84,961	£84,961	£84,961
On-site monitoring	966	50%	£5,000	£20,000	£1,000	£10,000	£169,922	£679,688	£652,922	£5,509,688
Review and development of odour management plan	966	0%	£2,000	£5,000	£500	£1,000	£0	£0	£0	£0
Review and development of noise management plan	966	0%	£5,000	£5,000	£1,000	£2,000	£0	£0	£0	£0
Total Cost			£43,000	£195,000	£4,000	£20,000	£1,070,509	£5,522,465	£2,278,009	£13,733,465
These costs are indicative estimates based on consultation and internal expert judgment.										
Total annualised costs are estimated based on installations affected and the proportion affected										
Total annualised costs are estimated using a discount rate of 3.5% over a 20 year lifetime which is consistent with the HM Treasury Green book										

Table B1.15 Estimated Compliance Costs for Waste Sector (Treatment of Metals) **EPR-Exempt Sites**

Cost Element	Affected installations	Proportion affected (%)	Capital cost (£/unit)		Annual cost (£/unit)		Total annualised capital cost (£)		Total annual cost (£)	
			Low	High	Low	High	Low	High	Low	High
Review treatment process / resource efficiency and undertake improvements	167	30%	£5,000	£50,000	-	-	£17,625	£176,254	£17,625	£176,254
Develop an EMS (including waste acceptance procedures)	167	100%	£5,000	£10,000	£500	£1,000	£58,751	£117,503	£142,251	£284,503
Develop an accident management plan	167	50%	£2,000	£10,000	-	-	£11,750	£58,751	£11,750	£58,751
Secondary containment, or other control measures, assessment and provision (if necessary)	167	10%	£5,000	£50,000	£500	£5,000	£5,875	£58,751	£14,225	£142,251
Drain integrity survey & report	167	50%	£2,000	£5,000	£500	£1,000	£11,750	£29,376	£53,500	£112,876
Development of a site closure plan	167	100%	£2,000	£5,000	-	-	£23,501	£58,751	£23,501	£58,751
Development of a Site Protection and Monitoring Programme (SPMP)	167	100%	£5,000	£30,000	-	-	£58,751	£352,509	£58,751	£352,509
Report on proposals for sampling access for monitoring	167	25%	£5,000	£5,000	-	-	£14,688	£14,688	£14,688	£14,688
On-site monitoring	167	50%	£5,000	£20,000	£1,000	£10,000	£29,376	£117,503	£112,876	£952,503
Review and development of odour management plan	167	30%	£2,000	£5,000	£500	£1,000	£7,050	£17,625	£32,100	£67,725
Review and development of noise management plan	167	30%	£5,000	£5,000	£1,000	£2,000	£17,625	£17,625	£67,725	£117,825
Total Cost			£43,000	£195,000	£4,000	£20,000	£256,744	£1,019,339	£548,994	£2,338,639
These costs are indicative estimates based on consultation and internal expert judgment.										
Total annualised costs are estimated based on installations affected and the proportion affected										
Total annualised costs are estimated using a discount rate of 3.5% over a 20 year lifetime which is consistent with the HM Treasury Green book										

