Ellgia Scunthorpe

Permit Variation Application reference ELL/019/V2

Technical Description

Operating Techniques, Technical Standards Including BAT Assessments

Contents

1 Introduction

There are currently 3 old style permits active on the site. This document supports the application to consolidate the three existing environmental permits into a single modern installation permit and to include the additional piece of land shown in ELL/006a as formerly owned by AC Carrington.

The activities and processes currently carried out on site (mechanical treatment and drying) will not change, however the site development strategy means the volumes of RDF and SRF being produced will classify these as installation activities.

It is also proposed to add EWC Code 19 12 10 - combustible waste (refuse derived fuel) to the list of permitted waste to allow for collaboration with other suitably licensed operators.

It is proposed to increase the permitted throughput from 237,010 (being the total of the three existing permits) to 300,000 tonnes per year to allow for ongoing development of the site.

2 Current Activities

2.1 Permit - EPR/LP3990CY (EAWML/43465)

2.1.1 Schedule 2 conditions

Specified Waste Management Operation	Permitted Waste Types which shall be subject to the Specified Operation	Limits on Specified Waste Management Operations
Storage	Inert	Storage max: 150 tonnes External/ Internal storage
	Scrap Metal	Storage max: 200 tonnes External/ Internal storage
	Asbestos	Storage max: 10 tonnes Internal storage only on bunded impermeable pavement
	Degradable Household/Commercial/Industrial	Storage max: 50 tonnes Internal storage only on -bunded impermeable pavement
Sorting/ Bulking	Inert	Internal/ External
	Scrap Metal	Internal/ External
	Degradable Household/Commercial/Industrial	Internal only on bunded impermeable pavement
Screening	Inert	Internal/ External
	Scrap Metal	
	Degradable Household/ Commercial/ Industrial	Internal only on bunded impermeable pavement
Crushing	Inert	Internal/ External
	Scrap Metal	Internal/ External

Table 1.2 amended 04/03/2011

Waste Type	Max Storage Volume (tonnes)	Max Treatment Capacity (tonnes/year)
Inert (C&D)	2,000	45,000
Scrap Metal	200	1,200
Degradable household	200	50,000
Degradable commercial		
Degradable industrial		
Wood	200	6,000
Paper	300	4,800
Cardboard	300	4,800
Plastics	150	2,000
Hazardous wastes	10	1,510
Total	**3,360**	**115,310**

2.2 Permit - EPR/WP/3397FZ (EAWML43094)

2.2.1 Specified Waste Management Operation

Specified Waste Management Operation	Permitted Waste Types which may be subject to the Specified Operation	Limits on Specified Waste Management Operations
D15: Storage pending, on this site any of the category 'D' operations authorised under this column, or elsewhere than on this site, any of the operations listed in Port Ill of Schedule 4 of the 1994 Regulations, (excluding temporary storage, pending collection, on the site where it is produced). **R13:** Storage of waste consisting of materials intended for submission, on this site to any of the category 'R' operations authorised under this column, or elsewhere than on this site, to any of the operations listed in Port IV of Schedule 4 of the 1994 Regulations, (excluding temporary storage, pending collection, on the site where it	Waste types in Table 1.2A	i) Maximum storage capacity 40650 tonnes ii) Stored on areas of hard standing or impermeable pavement provided in accordance with condition 2.1 iii) Stored in boys or containers provided in accordance with condition 2.1. iv) Green waste, biodegradable waste and metals should only be stored on impermeable pavement with a sealed drainage system

is produced).		
R3: Recycling or reclamation of organic substances which ore not used as solvents. **R4:** Recycling or reclamation of metals and metal compounds **R5:** Recycling or reclamation of other inorganic materials	Waste types in Table 1.2A	Treatment on areas of hard standing or impermeable pavement provided in accordance with condition 2.1 and consisting only of: i) physical sorting or separation of waste into different components, and ii) screening Treatment of green waste, biodegradable waste and metals should only take place on impermeable pavement with a sealed drainage system.

2.3 Permit – EPR/LYP/3090CV (EAWML43719)

2.3.1 Specified Waste Management Operation

Specified Waste Management Operation	**Permitted Waste Types which may be subject to the Specified Operation**	**Limits on Specified Waste Management Operations**
D15: Storage pending, on this site any of the category 'D' operations authorised under this column, or elsewhere than on this site, any of the operations listed in Port Ill of Schedule 4 of the 1994 Regulations, (excluding temporary storage, pending collection, on the site where it is produced). **R13:** Storage of waste consisting of materials intended for submission, on this site to any of the category 'R' operations authorised under this column, or elsewhere than on this site, to any of the operations listed in Port IV of Schedule 4 of the 1994 Regulations, (excluding temporary storage, pending collection, on the site where it is produced).	Waste types in Table 1.2A	i) Maximum storage capacity 25,080 tonnes ii) Stored on areas of hard standing or impermeable pavement provided in accordance with condition 2.1 iii) Stored in boys or containers provided in accordance with condition 2.1. iv) Green waste, biodegradable waste and metals should only be stored on impermeable pavement with a sealed drainage system

R3: Recycling or reclamation of organic substances which ore not used as solvents. **R4:** Recycling or reclamation of metals and metal compounds **R5:** Recycling or reclamation of other inorganic materials	Waste types in Table 1.2A	Treatment on areas of hard standing or impermeable pavement provided in accordance with condition 2.1 and consisting only of: i) physical sorting or separation of waste into different components, and ii) screening Treatment of green waste, biodegradable waste and metals should only take place on impermeable pavement with a sealed drainage system.

2.4 Summary of existing Permits

EPR/LP3990CY		
Waste Type	**Max Storage Volume tonnes**	**Max Treatment Capacity tonnes/year**
Inert (C&D)	2,000	45,000
Scrap Metal	200	1,200
Degradabale household	200	50,000
Degradable commercial		
Degradable industrial		
Wood	200	6,000
Paper	300	4,800
Cardboard	300	4,800
Plastics	150	2,000
Hazardous wastes	10	1,510
Total	**3,360**	**115,310**
EPR/WP3397FZ		
Those listed in Table 1.2A	40,650	46,700
EPR/YP3090CV		
Those listed in Table 1.2A	25,080	75,000
Permit	**Max Storage Volume te**	**Max Treatment Capacity te/yr**
EPR/LP3990CY	3,360	115,310
EPR/WP3397FZ	40,650	46,700
EPR/YP3090CV	25,080	75,000
Total	**69,090**	**237,010**

3 Installation Activities

3.1 Installation

Schedule 1 listed activities							
	Installation name	**Schedule 1 references**	**Description of the Activity**	**Activity capacity**	**Annex I (D codes) and Annex II (R codes) and descriptions**	**Hazardous waste treatment capacity**	**Non-hazardous waste treatment capacity**
AR1	Ellgia Scunthorpe	Section 5.4 Part A(1)b(ii)	Recovery or a mix of recovery and disposal of non-hazardous waste with a capacity exceeding75 tonnes per day involving pre-treatment of waste for incineration or co-incineration.	400.00	**R3**: Recycling/reclamation of organic substances which are not used as solvents. **D9**: Physico-chemical treatment resulting in final compounds or mixtures which are discarded by any of the operations numbered D1 to D12.		400
AR2	Ellgia Scunthorpe	Section 5.4 Part A(1)(a)(iii)	Disposal of non-hazardous waste with a capacity exceeding 50 tonnes per day involving pre- treatment of waste for incineration or co-incineration.	400.00	**R3**: Recycling/reclamation of organic substances which are not used as solvents. **D9**: Physico-chemical treatment resulting in final compounds or mixtures which are discarded by any of the operations numbered D1 to D12.		400

Directly associated activities		
Name of DAA		**Description of the activity**
AR3	Storage of non-hazardous waste prior to treatment.	Storage of non-hazardous waste prior to submission to activity AR1 and AR2. Storage within a building or on impermeable concrete surface with contained drainage. Waste types as specified in section 3. **R13**: Storage of waste pending any of the operations numbered R1 to R12 (excluding temporary storage, pending collection, on the site where the waste is produced). **D15**: Storage pending any of the operations numbered D1 to D14 (excluding temporary storage, pending collection, on the site where the waste is produced).
AR4	Storage of non-hazardous	Storage of SRF and RDF produced from activity AR1 and AR2 prior to dispatch off site.

	waste following treatment.	Storage within a building (except for wrapped bales of waste). Waste types as specified in section 3. **R13**: Storage of waste pending any of the operations numbered R1 to R12 (excluding temporary storage, pending collection, on the site where the waste is produced). **D15**: Storage pending any of the operations numbered D1 to D14 (excluding temporary storage, pending collection, on the site where the waste is produced).	
AR5	Drying SRF feedstock material	Includes 1 x 999kW biomass boiler used to heat hot air type drying floor. System is used to dry certain SRF feedstock material prior to being transferred to installation activity: **AR1**	
	For installations that take waste	Total storage capacity	69,090
		Annual throughput (tonnes each year)	400,000

3.2 Waste Operations

Ref	Name of the waste operation	Description of the waste operation	Annex I (D codes) and Annex II (R codes) and descriptions	Hazardous waste treatment capacity	Non-hazardous waste treatment capacity
AR6	Ellgia Scunthorpe	Waste Transfer Station	**D15**: storage pending any of the operations numbered D1 to D14 (excluding temporary storage, pending collection, on the site where it is produced **R13**: Storage of wastes pending any of the operations numbered R1 to R12 (excluding temporary storage, pending collection, on the site where it is produced) D14: Repackaging prior to submission to any of the operations numbered D1 to D13 **D9**: Physico-chemical treatment not specified elsewhere in Annex IIA which results in final compounds or mixtures which are discarded by means of any of the operations numbered D1 to D8 and D10 to D12 **R3**: Recycling/reclamation of organic substances which are not used as solvents **R4**: Recycling/reclamation of metals and metal compounds **R5**: Recycling/reclamation of other inorganic materials		1,500
AR7	Ellgia Scunthorpe	Materials Sorting and Materials Recovery Facility	**R13**: Storage of wastes pending any of the operations numbered R1 to R12 (excluding temporary storage, pending collection, on the site where it is produced) **R3**: Recycling/reclamation of organic substances which are not used as solvents **R4**: Recycling/reclamation of metals and metal compounds **R5**: Recycling/reclamation of other inorganic materials		1,500
	For all waste operations	Total storage capacity (see note 2)			69,090
		Annual throughput (tonnes each year)			400,000

4 MANAGEMENT TECHNIQUES

4.1 Technical Competence

Under the EP Regulations, the activities at the Installation are classified as specified waste management activities, and, accordingly, a Technically Competent Manager will be required. The site has 3 COTC Holders, details are included in document ELL_004 along with WAMITAB qualification certificates.

4.2 Environmental Management

4.2.1 Background

Ellgia operates an Environmental Management System ("EMS") which addresses environmental aspects of the activities at the Installation. The site is currently implementing ISO 14001 and copies of registration and certificates will be provided in due course.

Ellgia's Directors have overall responsibility for the site. Responsibility for environmental matters at the Installation rests with the Site Operations Manager.

Ellgia's EMS is designed to:

- ensure compliance with all relevant legislation;
- ensure compliance with the conditions of the Installation's Environmental Permit;
- identify, assess and minimise the risks of pollution arising from the Installation's activities;
- comprise a range of written procedures that cover all aspects of the Installation's activities;
- identify, set, monitor and review environmental objectives and key performance indicators; and
- include a requirement to report annually on environmental performance, objectives, targets and future planned improvements.

4.3 Summary of the Environmental Management System

The content and objectives of the EMS are summarized below.

4.3.1 Planning

- identification of environmental impacts and aspects associated with the Installation's activities, and assessing their significance; including an assessment of the potential environmental risks posed by the work of contractors;
- identification and evaluation of relevant legal and other relevant requirements;
- identification of environmental objectives and targets that will be focused on reducing the impact of the identified significant environmental aspects;

- a series of risk assessments to cover a range of issues, including site operations, maintenance, accidents, training and records; and
- details of how Ellgia ensure that any relevant standards, guidance and codes of practice are met on an ongoing basis.

4.3.1.1 Outcomes:

- a comprehensive understanding of the potential and actual impacts of the permitted activities on the surrounding environment and people's health;
- the correct appropriate measures selected to manage environmental risks and prevent or minimise their effects so as not to cause pollution;
- a series of documented procedures covering all aspects of the Installation's activities; and
- a series of documented environmental objectives and targets, together with an action plan/development programme to ensure that these are met.

4.3.2 Implementation and Operation

- EMS roles and responsibilities are clearly defined and documented, and that site staff are made aware of these;
- The installation is operated by suitably competent staff who have received the necessary training in all aspects of the plant's operation, including where contractors are used, ensuring that they are suitably competent; in this regard:
    - the skills and competencies necessary for key posts are documented; these key posts include contractors, those responsible for liaising with contractors and those purchasing equipment and materials,
    - training requirements are identified by means of a documented training needs analysis,
    - documented training records are kept and updated as required,
- Training specifically addressee's environmental awareness and environmental permit requirements, and the requirement for ongoing/refresher training is identified;
- There are site layout plans - including drainage plans - and they are revised as required to reflect any changes at the Installation.
- There are documented procedures covering internal and external communications.
- There are procedures in place for staff and contractors to have access to the Installation's permit and management system requirements; with regard to contractors, ensuring that suitable instructions are provided with regard to protecting the environment whilst working on site;
- There is documented planned preventative maintenance regime ("PPMR") to ensure that all plant and site infrastructure are kept in suitable condition and operating effectively; the PPMR details what maintenance, tests and inspections need to done and when; this also details the measures required to ensure continuing compliance with the permit conditions during maintenance/shutdown. The PPMR also:

    - identifies known or predictable malfunctions associated with the operations and the procedures, spare parts, tools and expertise required to deal with them,
    - includes a record of spare parts held, or details on where they can be sourced from, together with an assessment of how long they would take to obtain,
    - includes all “Critical Equipment List” i.e. equipment or plant whose failure could directly or indirectly lead to an impact on the environment or human health and ‘non-productive’ items,
    - ensures the necessary spare parts, tools, and competent staff are available prior to commencing maintenance;
- There are procedures covering document control;
- There are suitable record-keeping arrangements in place;
- There are documented operational procedures, risk assessments and work instructions covering all aspects of the Installation’s operation;
- There are documented procedures to address non- conformities/non-compliances and the associated corrective and preventative action; these will detail the means by which any such non-conformities/non- compliances are reported to management and the means by which they are reported to Environment Agency (“EA”)
- There is a documented procedure for dealing with complaints; this includes:
    - an appropriate person deals with the complaint,
    - the complaint is properly recorded,
    - the complaint is properly investigated,
    - any action necessary to deal with the cause of the complaint is recorded,
    - the impact of the activity causing the problem is minimised,
    - steps are taken to ensure that the problem is not repeated,
    - details of any justified complaints are reported to senior management,
    - that the complainant (or EA, as appropriate) is responded to in writing,
    - if the complaint came via EA, a suitable documented response is provided to EA,
    - if the complaint has come from a neighbour or a member of the public, a suitable documented response is provided to the complainant, and, if the complaint is substantiated, a report is provided to EA, and
- The EMS is amended accordingly to reflect any changes;
- There are documented procedures covering emergency preparedness and response; these will cover such incidents as major plant failures, significant spillages of potentially polluting substances, loss of mains electrical power and fire.
- The site will maintain a Fire Prevention Plan (FPP) and the Accident Management Plan (AMP); and implement measures to communicate the Plan to all employees, management and contractors who work at the site.
- Compliance is maintained with all permit conditions and operating procedures during maintenance/shutdown at the Installation or elsewhere and permitted storage limits are not exceeded and appropriate measures for waste storage and handling continue to be applied in the event of shutdown. Acceptance of waste shall cease in the event of shutdown unless a clearly defined method of recovery or disposal has been determined and sufficient permitted storage capacity is available.

4.3.2.1 Outcomes

- evidence that day-to-day activities are taking place in accordance with the requirements of the EMS and the Installation's permit
- control measures and procedures are an integral part of the business operation;
- the EMS is easy for staff to access, understand and use;
- staff are suitably trained and competent to carry out procedures and control measures; and
- the requirements of the EMS are effectively communicated to management, staff and contractors.

4.3.3 Check and Review

- All regulatory requirements in relation to monitoring and measurement are complied with, specifically:
  - the requirements relating to inspection and testing required under the applicable environmental legislation and the Installation's permit (including a list of the scheduled monitoring programmes) and the associated procedures and work instructions,
  - the requirements relating to inspection and testing required under the applicable health and safety legislation and the associated procedures and work instructions, and
  - the requirements relating to the control of all inspection, measuring and test equipment relating to environmental requirements.
- Maintain ongoing evaluation of compliance with environmental legal requirements, policy requirements and objectives and targets; this will include:
  - an annual review of Ellgia's environmental systems
  - regular plant inspections, and
  - internal audit procedures
- Non-conformities/non-compliances are properly recorded, investigated and that the appropriate corrective action is taken by the due date;
- The necessary reporting and record-keeping required under the various permits, licences and consents are complied with;
- Internal audits are carried out in accordance with the documented procedures and that any audit actions are followed up; and
- Results of all audits are made available to Senior Management on a regular basis.
- Review the EMS to ensure that it is appropriate, being implemented and kept up to date, e.g., that any supplementary plans have been included into the EMS
- Conduct a management review of the EMS when:
  - there are changes on site (in activities and/or plant/equipment),
  - if there is an accident, complaint, or breach of permit conditions.
- annual review of both individual and organisational training needs; ensuring that all changes to the EMS are properly recorded, and, if there are any major changes, EA is informed;

- Conduct an assessment of whether the Installation's objectives, and any targets, have been met and reported and review objectives and targets, and, where appropriate, any revisions to these to effect continual improvement.

4.3.3.1 outcomes

- Checks are carried out to ensure that the EMS is being implemented as intended, i.e. as
- Documented
- the necessary preventative and corrective actions are undertaken to minimise
- non-compliances.
- the EMS is kept up to date, and
- the EMS is continually improved

The full EMS has been submitted under document reference ELL/005.

5 OPERATING TECHNIQUES

5.1 Technical Standards

The application is based on the following regulations, directives and guidance

5.1.1 European Legislation

- the Industrial Emissions Directive ("IED") is intended to be a single legislative instrument for permitting, compliance and enforcement of environmental legislation across all member states. The requirement of the IED will therefore be considered relevant at this time; and
- the Waste Treatment Industries Best Available Techniques Reference Document ("BREF") (October 2018) will be considered as it covers installations associated with a number of waste treatments, including recovery and disposal of waste.

5.1.2 UK Legislation

EA guidance documents:

- All relevant EA online webpage guidance, such as 'Develop a management system' (December 2019) and 'Control and monitor emissions for your environmental permit' (February 2020); and
- EA Sector Guidance Note IPPC S5.06 'Guidance for the Recovery and Disposal of Hazardous and Non-Hazardous Waste' (Issue 5, Date 2013).
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5.2 Overview of the Activities

The site currently operates as a waste treatment and transfer facility, receiving non-hazardous municipal, commercial and industrial waste. Waste is mechanically treated to remove recyclable material which is transferred to other sites for further processing. The residual waste fraction is processed to produce refuse derived fuel (RDF) and solid Recovered fuel (SRF) which are sent to energy recovery facilities and for co-firing cement kilns in the UK and overseas.

The Scunthorpe processing facility includes a drying floor which is used to reduced moisture levels and increase calorific values in SRF. The drying floor uses air heated by a 1 MW biomass boiler.

The activities on site will not change because of the permit consolidation / variation. The primary reasons for the application are to simplify the permitting into a single modern style permit and add an installation due to the volumes of RDF and SRF being produced. The planned operation and processing volumes of the site render it activities as and installation as follows:

Part A (1)(a)(iii)	Disposal of non-hazardous waste with a capacity exceeding 50 tonnes per day (or 100 tonnes per day if the only waste treatment is anaerobic digestion) involving one or more of the following activities: **pre-treatment of waste for incineration or co-incineration.**
Part A (1)(b)(ii)	Recovery or a mix or recovery and disposal of non-hazardous waste with a capacity exceeding 75 tonnes per day (or 100 tonnes per day if the only waste treatment is anaerobic digestion) involving one or more of the following activities: **pre-treatment of waste for incineration or co-incineration.**

Other activities on site shall remain classified as waste operations of a household, commercial and industrial waste transfer station. The list of current and proposed activities, directly associated activities (DAAs), and waste operations is set out in ELL/003.

The planned layout includes 6 treatment operations as follows:

1. C&D waste pre-treatment
2. C&I waste pre-treatment
3. SRF preparation
4. SRF Drying
5. RDF Preparation 1
6. RDF Preparation 2 (not yet built)

Waste treatment at the installation will consists of the following processes:

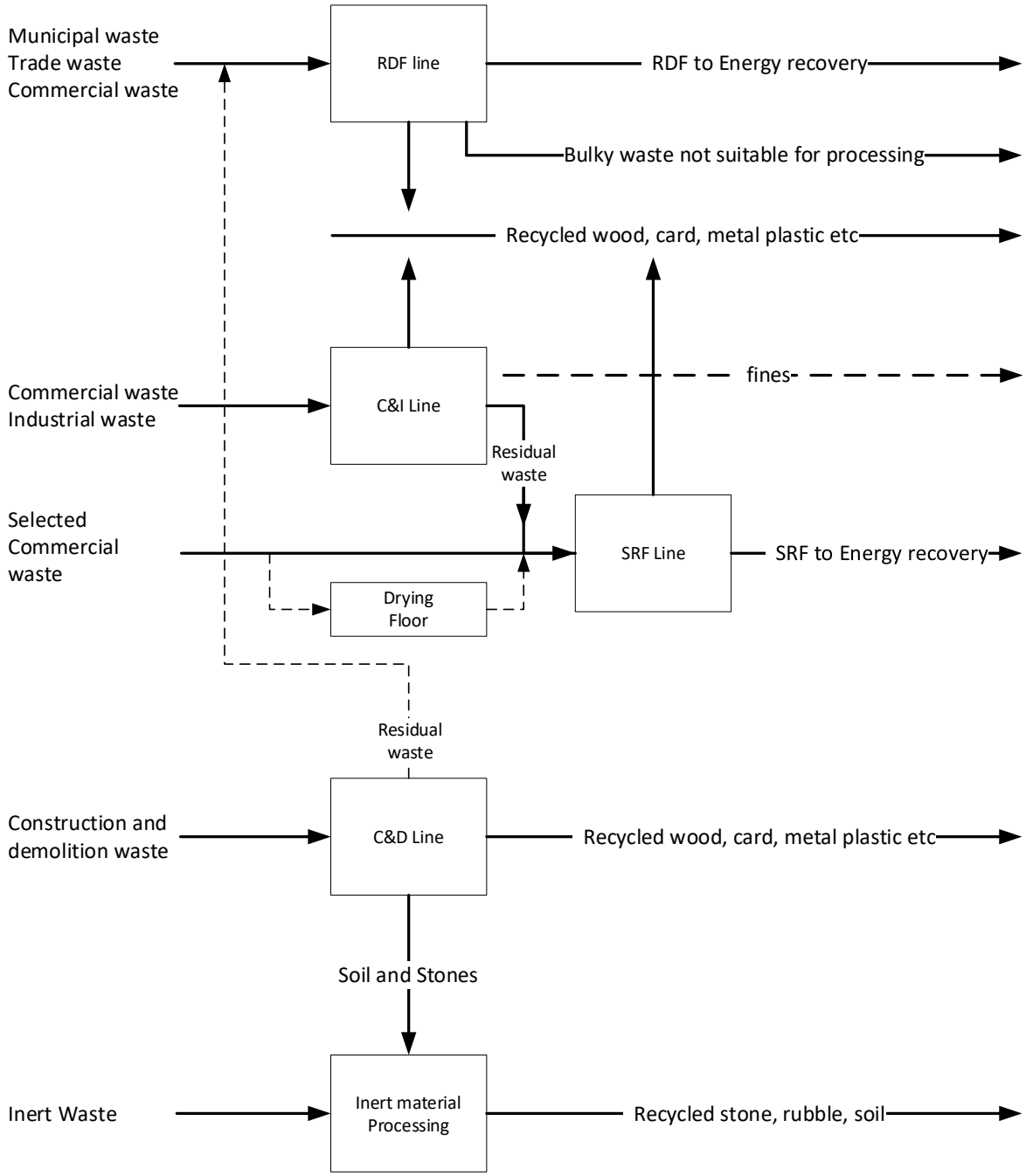
Process	Equipment
sorting and separating waste types mechanically;	4 x shredders 2 x screeners (1 x vibrating, 1x trommel)
recycling	1 x density separator 8 x magnets 1 x eddy current separator
drying waste (SRF feedstock) to improve fuel quality	1 x 999kW biomass boiler 1 x air draught drying floor

Process flow diagram of the proposed activities are provided in figures **1-x below.** These also show the processing equipment used at the site.

Baled SRF and RDF will be stored in designated storage areas, recycled material will be stored in concrete bays or metal containers. The layout of the treatment and storage activities is shown in drawing Ell/SCU/FPP/011.

The main processing buildings are fitted with fire detection and extinguishing systems with infra-red and CCTV cameras which constantly scan the building and feed information live to a control centre which is monitored 24 hours per day. In the event of a hot spot the alarms are activated, and water cannon are targeted and activated from the monitoring centre. The full Fire Prevention plan is included with the applications ref SCU/FPP/002b.

Figure 1 ELL/006d Ellgia Scunthorpe Overall Site Process Schematic



A breakdown of each of the processing lines is given in appendix 4

5.3 Waste Pre-Acceptance

Ellgia will put in place a fully documented waste pre-acceptance procedure, the purpose of which will be to ensure that wastes are subject to appropriate technical appraisal prior to acceptance at the site.

The Waste pre-acceptance procedure will be added to the EMS. This will ensure that unsuitable wastes are not accepted. These checks will be carried out before any decision is made to accept a waste and or enter into any contractual agreement with a waste producer. When a waste disposal enquiry is received the following information must be provided in writing by the waste producer:

- details of the waste producer, including address and contact details;
- the specific process from which the waste derives; and
- an indication of the waste streams produced, their quantity, physical form, composition, properties, classification and description.

Pre-acceptance checks and subsequent assessments will be conducted by an Ellgia representative. For every case, a representative sample will be the obtained from the production process/current holder to compare against the description provided by the waste holder. The only exception to this would be if a sample and subsequent analysis has already been undertaken by a third party.

Where required a detailed site waste audit will be conducted by a suitably qualified Ellgia reprehensive. In all cases a Waste Characterisation and Pre-Acceptance Form (see Appendix A) must be competed and signed by the waste producer and Ellgia prior to the receipt of any waste at the site.

Following characterisation of the waste and confirmation of a match against the waste description, a technical assessment of the waste will be undertaken with regard to its suitability for treatment at the Installation.

A COTC holder will assess the waste producer's audit report. A record of the assessment will be kept, its conclusions, and any actions taken.

Where the audit report is partially incomplete or inadequate, the COTC holder will request and obtain the required information (or another audit report) prior to accepting the waste.

Where the technical assessment has been be undertaken by a third party, Ellgia will:

- ensure that all details of the content of any audit tools or methodologies and assessment criteria used by that party are provided to Ellgia;
- ensure that the methodology used by the third party meets Ellgia's own procedures in relation to pre-acceptance;
- keep a summary report from the third party which will demonstrate that pre-acceptance and assessment has been conducted including the following information

- confirmation of the producer types, waste types, containers etc.
- confirm a composite waste classification, description, composition, and properties for each waste stream and container type destined for the Installation, derived from each of the pre-acceptance audits and with reference to the permitted wastes for the site,
- confirmation of any issues that have been identified and what action has been taken with regard to the producers and wastes affected;

- annually audit a random and representative cross-section of the other party's pre-acceptance checks to ensure both the quality of pre-acceptance checks, subsequent assessments, waste classification and descriptions;
- keep records of all audits; and
- keep electronic records of the pre-acceptance report and assessment.

All records relating to pre-acceptance at the site will be kept for a minimum of five years at the Ellgia Site Office. Electronic copies will be held on site to ensure direct access to those records for cross-reference and verification at the waste acceptance stage.

5.4 Waste Acceptance Procedure

The waste acceptance procedure is contained in the EMS ref: BW EM 02-003, in summary the procedure is as follows:

1. Procedure:

- All delivery drivers bringing waste on to site will drive onto the weighbridge and report to the Site Office and present the relevant waste documentation;
- The WTN / CN of the load will be inspected against the sites accepted list of wastes and the weight of the load noted;
- Where necessary loads will be visually inspected using the CCTV system at the weighbridge or a by a member of staff;
- The WTN / CN will be inspected to ensure they have been fully completed and the load will be logged onto the electronic storage system; (for non-conforming loads see section below)
- All records are kept electronically;
- The load will then be directed to the appropriate tipping point on site;
- Once unloaded waste will be inspected visually by banksmen to ensure that it complies with the sites accepted list of waste.
- Once the waste has been unloaded, the driver will then proceed back over the weighbridge to be weighed in order to establish the exact volume of waste received on site;
- A weighbridge ticket / receipt will be issued to the driver for public / non-scheduled waste deliveries.

Non-Conforming Loads (rejection)

- Non-conforming loads intercepted at the weighbridge and those identified during unloading will be sent to the site isolation area for quarantine;
- Loads made up entirely of suspected non-conforming waste will placed to one side, inspected and a decision made by Site Management as to whether the load is to be directed back to the sender. Where loads are returned to the sender the supplier of the waste will be informed in writing and asked to provide results of their investigation into the circumstances of the delivery.
- Loads containing permitted materials that are identified as odorous upon arrival with the potential to impact on sensitive receptors will be treated and removed from site as a matter of priority;
- Loads identified following tipping which are odorous with the potential to impact on sensitive receptors will be treated and removed from site as a matter of priority;
- If waste streams arrive on site which the facility is not licensed to accept and are not returned to sender, site will send the waste to an appropriate facility for disposal or recovery.
- Records of non-conforming waste received / identified at site and the action taken to remove the waste from site, will be detailed using the internal Waste Rejection System for loads identified after tipping or on Incident and Corrective Action Report Forms for all other non-conformities.

5.5 Storage & Treatment

The storage and treatment activities at the site are materials recycling and the preparation of RDF and SRF. Associated activities include drying waste prior to processing in the SRF using a biomass boiler and hot air dying floor and the processing of grade A wood for use as biomass fuel. The site activities as defined in the Waste Framework Directive are set below.

5.6 Types of Waste Stored

The following types of waste are routinely stored in piles on the site:

Description	Fire Prevention Designation	Fraction size mm
RDF Feedstock material (pre-processing)	RDF	>300
RDF - processed	RDF	<300
SRF - Feedstock material (pre-processing)	SRF	>300
SRF – processed loose	SRF	30-40
SRF – processed baled	SRF	baled
Grade A wood	wood	>150
Grade C wood	wood	>150
Chipped wood Biomass fuel	wood	50-120
Green waste	Compost and green waste	>150

Mattresses	Textiles	>150
Metal	Metal other than WEE	>10
Cardboard loose	Paper and cardboard	>150
Cardboard baled	Paper and cardboard	baled
Plastic loose	Plastic	>150
Plastic baled	Plastic	baled
Soils and Stones	N/A	

All other waste is stored in open or sealed containers in line with the EMS, Hazardous Waste Storage Procedure (**EL EM 02 009)** and Waste Storage and Dispatch Procedure **(EL EM 04 004)**

5.6.1 Maximum pile sizes

The maximum pile sizes are given in section 9.2 of the EA guidance. All waste piles shall be maintained within the maximum sizes given in the current EA Guidance. For all waste piles,

- the maximum height allowed is 4m.
- the maximum length or width allowed (whichever is the longest) is 20m

When measuring height, you must use the longest measurement between the base of the pile and the top. This is to allow for any uneven ground beneath the waste.

If waste piles contain a mixture of combustible wastes, the maximum limit shall be based on the type of waste that makes up most of a mixed pile. Waste piles are managed and located to allow adequate access for fire detection and extinguishing.

The Table below shows the maximum volume of each type of waste pile, the maximum square dimension for a pile 4m high and the maximum width of a pile 4m high and 30m long.

Maximum volume m^3			
Waste type	**Loose and more than 150mm**	**30 to 150mm or baled**	**Less than 30mm**
Tyres and rubber	450	300	300
Wood	750	450	300
Compost and green waste	750	450	450
RDF and SRF	450	450	450
Plastics	750	450	300
Paper and cardboard	750	750	450

Textiles	750	750	450
WEEE containing plastics, including fridges, computers, and televisions	450	450	450
Metals other than WEEE	750	450	450
Fragmentiser fluff	450	450	450
Maximum square dimensions (m) if 4m high			
Waste type	**Loose and more than 150mm**	**30 to 150mm or baled**	**Less than 30mm**
Tyres and rubber	10.61	8.66	8.66
Wood	13.69	10.61	8.66
Compost and green waste	13.69	10.61	10.61
RDF and SRF	10.61	10.61	10.61
Plastics	13.69	10.61	8.66
Paper and cardboard	13.69	13.69	10.61
Textiles	13.69	13.69	10.61
WEEE containing plastics, including fridges, computers, and televisions	10.61	10.61	10.61
Metals other than WEEE	13.69	10.61	10.61
Fragmentiser fluff	10.61	10.61	10.61
Maximum width if 4m high and 20m long (m)			
Waste type	**Loose and more than 150mm**	**30 to 150mm or baled**	**Less than 30mm**
Tyres and rubber	5.63	3.75	3.75
Wood	9.38	5.63	3.75
Compost and green waste	9.38	5.63	5.63
RDF and SRF	5.63	5.63	5.63
Plastics	9.38	5.63	3.75
Paper and cardboard	9.38	9.38	5.63
Textiles	9.38	9.38	5.63
WEEE containing plastics, including fridges, computers, and televisions	5.63	5.63	5.63
Metals other than WEEE	9.38	5.63	5.63

Fragmentiser fluff	5.63	5.63	5.63

5.6.2 Storing waste materials in their largest form

Waste is stored in its largest form wherever possible. RDF is only shredded prior to being removed from site. SRF is only shredded prior to being removed from site for loose offtake contracts or is immediately baled and stored according to the maximum storage limits for sea freight contracts.

5.6.3 Maximum Pile Sizes Ellgia Scunthorpe

Maximum Pile Sizes and locations (see Drawing ELL/SCU/FPP/011)

Waste Type	Location	Storage Type	Max. length m	Max. width m	Max. height m	Max Volume m^3	Max. time it will be stored
RDF Feedstock material	17	pile	10.6	10.6	4	450	72 hours
RDF - processed	18	pile	10.6	10.6	4	450	72 hours
SRF - Feedstock material	1	pile	10.6	10.6	4	450	72 hours
SRF – processed loose	2	pile	10.6	10.6	4	450	72 hours
SRF – processed baled	3,7,8	bales	10.6	10.6	4	450	4-6 weeks
Grade A wood	10	concrete bay	13.7	13.7	4	750	4 weeks
Grade C wood	11	concrete bay	13.7	13.7	4	750	4 weeks
Chipped wood Biomass fuel	5	concrete bay	10.6	10.6	4	450	72 hours
Green waste	19	skips	6	2.4	3	160	1 week
Mattresses	16	pile	13.7	13.7	4	750	2-3 weeks
Metal	9	pile	13.7	13.7	4	750	1 week
Cardboard loose	4	concrete bay	13.7	13.7	4	750	2 weeks
Cardboard baled	3,7,8	bales	13.7	13.7	4	750	2 weeks
Plastic loose	4	pile	13.7	13.7	4	750	2 weeks
Plastic baled	8	bales	10.6	10.6	4	450	2 weeks
CA Waste	20	skips	6	2.4	4	160	72 hours

5.6.4 Waste Stored in Containers

In addition to the waste piles detailed in section 7.3, small amounts of green waste and CA waste are stored temporarily in skips and or roll-on roll-off skips with the following dimensions:

Waste Stored in Containers

Waste	Container Type	Size
CA - Green Waste	Skip	
CA - general	Skip	
CA - Metal	Skip	
CA Cardboard	Skip	

5.6.5 Accessibility of containers

Containers are all readily accessible from at least two sides so a fire can be extinguished easily. The locations of the containers are shown on the Drawing Ell/SCU/FPP/010. They shall be maintained in positions that allow them to be easily moved as soon as is reasonably practicable to prevent the fire spreading.

5.7 Waste Treatment

5.7.1 Preparation of RDF

The RDF building receives mainly municipal and commercial waste. Material is tipped in the reception area where it undergoes a pre-pick to remove recyclable and bulky material. It is then shredded, and metals removed by magnets. Processed material is loaded onto bulk haulage vehicles for transport to energy recovery facilities. See drawing: Ell/SC/FPP/010.

WFD Annex I and II operations	**R4**: Recycling / reclamation of metals and metal compounds. **R5**: Recycling / reclamation of other inorganic materials. **D9**: Physico-chemical treatment resulting in final compounds or mixtures which are discarded by any of the operations numbered D1 to D12.
Equipment used	Lindner Jupiter Shredder Eriez magnet Loading shovel 360 grab
Location	RDF Building South Site

5.7.2 Preparation of SRF

The SRF building receives selected commercial waste. Material is tipped in the reception area where it undergoes a pre-pick, inspection and mixing to remove recyclable material and provide suitably blended material for processing. It is then fed into the SRF production line with the following stages: primary shredding to reduce fraction size to sub 300mm; magnet 1 and magnet 2 to remove ferrous metals, eddy current separator to remove nonferrous metals; air density separator to remove any remaining heavy material; secondary shredding to sub 30mm; magnet 3 to remove any reaming ferrous metal. The processed SRF is then baled in a Dicom vertical baler and moved to the SRF storage area outside the building or loaded into bulk haulage vehicle for transport to energy recovery facilities or cement kilns. See drawing reference See drawing: Ell/SC/FPP/010.

WFD Annex I and II operations	**R4**: Recycling / reclamation of metals and metal compounds. **R5**: Recycling / reclamation of other inorganic materials. **D9**: Physico-chemical treatment resulting in final compounds or mixtures which are discarded by any of the operations numbered D1 to D12
Equipment used	Lindner Jupiter Shredder 3 x magnets Eddy current separator ADSS Air Density Separator Lindner Komet shredder Dicom vertical baler CrossWrap bale wrapping machine Loading shovel 360 grab Telehandler Clamp truck
Location	SRF Building North Site

5.7.3 Drying SRF feedstock material

Material suitable for SRF production but with high moisture content can be dried on the air heated drying floor prior to be transferred to the SRF line. Specifically identified incoming loads are tipped directly on the drying floor for periods of 12-24 hours to reduce moisture levels to within those specified in the SRF supply agreement. When the material is sufficiently dried it is transferred in 40-yard containers to the SRF reception area or subject to operational requirements stored temporarily in the store building adjacent to the drying floor. See drawing: Ell/SC/FPP/011.

WFD Annex I and II operations	**D9**: Physico-chemical treatment resulting in final compounds or mixtures which are discarded by any of the operations numbered D1 to D12 **D15:** Storage of non-hazardous waste prior to treatment **R13**: Storage of waste pending any of the operations numbered R1 to R12

Equipment used	1MW Ariterm Biomass Boiler Drying Floor Loading shovel
Location	Drying Floor North Site Post Drying Store North Site

5.7.4 Processing of Construction and Demolition Waste (C&D)

The C&D line receives construction and demolition waste primarily in skips and roll-on-off containers Material is tipped at the material pre-sort area where it undergoes a pre-pick to remove bulky recyclable material. The material then passes through a trommel to remove soil and fines and then on to a picking line with a Dual action Blower and Suction system to remove light material such as plastic, paper, foam, and cardboard. Wood, hard plastic and nonferrous metals are removed on the picking section and an over-band magnet removes ferrous metal. Heavy material consisting of mainly inert material passes through the line and is collected for further processing or recycling. See drawing: Ell/SC/FPP/010.

WFD Annex I and II operations	**R3**: Recycling / reclamation of organic substances which are not used as solvents. **R4**: Recycling / reclamation of metals and metal compounds. **R5**: Recycling / reclamation of other inorganic materials. **R12** Sorting of wastes before any recovery operation R1 to R10 (other than R3 to R5 **D9**: Physio-chemical treatment not specified elsewhere which results in final compounds or mixtures which are discarded by means of any of the operations numbered D1 to D12. **D15**: Temporary Storage pending any of the operations numbered D1 to D14
Equipment used	Loading shovels 360 grabs Picking line Vacuum / fan density separator Magnet
Location	South Site

5.7.5 Processing Commercial and industrial Waste

The C&I line receives commercial and industrial waste that is not suitable for direct feed to the SRF line. Material is shredded to reduce particle size to sub 300mm and then passes through a trommel to remove fines (<20mm). It then passes over a 6-bay picking line to remove recyclable materials and inert / heavy materials. Ferrous metals are removed by an overbend magnet, and the residual material is moved to the SRF line for further processing.

See drawing: Ell/SC/FPP/010.

WFD Annex I and II operations	**R3**: Recycling / reclamation of organic substances which are not used as solvents. **R4**: Recycling / reclamation of metals and metal compounds. **R5**: Recycling / reclamation of other inorganic materials. **D9**: Physio-chemical treatment not specified elsewhere which results in final compounds or mixtures which are discarded by means of any of the operations numbered D1 to D12. **D15**: Temporary Storage pending any of the operations numbered D1 to D14
Equipment used	Loading shovel 360 grab Tana mobile shedder Tana mobile trommel Magnet Picking line
Location	South Site

5.7.6 Inert Material Processing

The inert yard receives direct loads of incoming waste which consist entirely of soil, stones, rubble, sand, or other inert material. It also receives inert material from the C&D processing line. The material is screened using a

WFD Annex I and II operations	**R5**: Recycling / reclamation of other inorganic materials. R12 (excluding temporary storage, pending collection, on the site where the waste is produced). **D9**: Physio-chemical treatment not specified elsewhere which results in final compounds or mixtures which are discarded by means of any of the operations numbered D1 to D12. **D15**: Temporary Storage pending any of the operations numbered D1 to D14
Equipment used	Loading shovels Excavator Power Screen Warrior 3-way screener
Location	South Site

5.7.7 Storage of non-hazardous waste prior to treatment

Wherever possible storage of combustible material on site is minimised, however for operational and processing reasons it is necessary store material temporarily prior to processing in in one of the 4 process line on the site.

Waste is processed in a manner to ensure prompt turnaround to reduce any possible emissions to air and / or heat build-up. Waste is normally be processed in the order delivered, unless wastes have been delivered with a higher odour potential which need to be processed first. Shovel and grab operators manage the input and output areas and bays so that waste can be treated on a first in first out basis.

Where municipal wastes have been received that have been assessed as containing higher levels of potentially odorous materials, consideration will be given to prioritising the processing of these wastes where necessary.

Any incorrectly declared deliveries will be quarantined immediately and dealt with in line with local procedures and guidance as detailed in the permit and management system.

Pre-acceptance and waste acceptance procedures are in place for all waste accepted at the site to ensure that incompatible or reactive wastes are not accepted at the site.

WFD Annex I and II operations	**R13**: Storage of waste pending any of the operations numbered R1 to R12 **D15**: Storage pending any of the operations numbered D1 to D14
Equipment used	Loading shovels 360 grabs Telehandler Clamp truck
Location	SRF Building North Site RDF Building South Site Post-Drying Store North Site C&D line input area South Site C&I line input area South Site

5.7.8 Storage of non-hazardous waste following treatment

As with storage prior to treatment (4.1.5) wherever possible storage of combustible material on site is minimised and the primary objective is to remove all processed material from site as soon as possible. However, for operational and logistical reasons it is sometimes necessary store processed material temporarily prior to removal from site or transfer to another activity on site. Particularly baled SRF which forms part of bulk shipping consignments. Supervisors manage process output areas and bays so minimise storage time and pile sizes.

WFD Annex I and II operations	**R13**: Storage of waste pending any of the operations numbered R1 to R12 **D15**: Storage pending any of the operations numbered D1 to D14
Equipment used	Loading shovels 360 grabs Telehandler Clamp truck
Location	SRF Building North Site RDF Building South Site Post-Drying Store North Site C&I line output area South Site

5.8 Site plans and Drawings

Plans	
Permits Locations	ELL/006a
Site layout plan 2022	ELL/006b
Point Source Emissions & Drainage Plan 006c	ELL/006c
Process Flow	ELL/006d
Scunthorpe AQMA	ELL/006e
Receptors Plan	ELL/006f
Location Plan	ELL/SCU/FPP/001
Site Plan	ELL/SCU/FPP/002
Site Layout and Storage Plan (proposed)	ELL/SCU/FPP/011
Fuels and Oils Storage	ELL/SCU/FPP/011a

5.9 Waste Sampling & Analysis

5.9.1 Pre-acceptance

Representative samples of waste shall be examined and or analysed as required as part of the pre-acceptance procedure.

5.9.2 Waste categorization

Waste categorisation is carried out on trommel fines in accordance with the fines sampling plan, Document Reference: SCU/FSP/TF/001, see Appendix 2. The Sampling plan details the sampling and analysis procedure undertaken by Ellgia Scunthorpe in relation to the classification of trommel fines in accordance with The Waste Classification Technical Guidance WM3. The Structure of the sampling plan is based on BS EN 14899 2005.

The objective of waste sampling and testing to obtain sufficient information on the nature,

composition and properties of fines generated in waste processing and determine if it is hazardous waste or non-hazardous. If the former then to assign hazardous properties, and to determine the correct List of Waste (LoW) code to be assigned.

The plan details sampling requirements and testing standards. Determination of the analysis is out by independent accredited laboratory. The sampling and analysis procedures will be compliant with the relevant international standard documentation.

5.9.3 SRF and RDF output quality

All outgoing SRF and RDF waste streams are sampled continuously to ensure the contractual quality standards are being met. Samples are taken as required to be compliant with BS EN 15442 Solid Recovered Fuels- Methods for sampling. This standard uses several data sets, such as particle size and bulk density to provide a set of principles which, if adhered to, produces a representative sample.

Sample analysis is undertaken by an accredited third part laboratory, the testing undertaken various depending on the exact requirement of the receiving entity but as a minimum includes the following:

Analysis	Standard	Document Title
Sampling	BS EN 15442	Solid Recovered Fuels – Methods for sampling
Sample Preparation	BS EN 15443	Solid Recovered Fuels – Methods for laboratory sample preparation
Moisture	DD CEN/ 15414-1	Solid Recovered Fuels – Methods for the determination of moisture content using oven dry method
Particle Size	BS EN 15415	Solid Recovered Fuels – Methods for the determination of particle size distribution by screen method
Bulk Density	BS EN 15401	Solid Recovered Fuels – Methods for the determination of bulk density
Ash	BS EN 15403	Solid Recovered Fuels – Methods for the determination of ash content
Sulphur & Chlorine	BS EN 15407	Solid Recovered Fuels – Methods for the determination of Sulphur, Chlorine, Fluorine and Bromine
Gross and Net CV	BS EN 15400	Solid Recovered Fuels – Methods for the determination of calorific value
Carbon, Hydrogen & Nitrogen	BS EN 15408	Solid Recovered Fuels – Methods for the determination of Carbon, Hydrogen and Nitrogen content
Biomass Content	BS EN 15440	Solid Recovered Fuels – Methods for the determination of biomass content
Trace Elements	BS EN 15411	Solid Recovered Fuels – Methods for the determination of trace elements- As, Ba, Be, Cd, Co, Cr, Cu, Hg, Mo, Mn, Ni, Pb, Sb, Se, Tl, V, Zn

An example of a fuel measurement and sampling plan is included in Appendix 3, document reference SCU/FSP/AND/001.

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5.10 Emissions Management & Housekeeping

The EMS contains detailed procedure and processes covering all current and planned activities. The table below shows how the procedure set out in the EMS relate to Storage & Treatment, Emissions Management & Housekeeping:

`EMS Ref	**Description**	Application Area			
		Acceptance and rejection	storage and treatment	emission management	house keeping
EM 01-001	Environmental Policy			■	■
EM 01-002	Fugitive Emissions Management Plan			■	
EM 01-003	Accident Management Plan	**See document**			
EM 01-004	Planned Preventative Maintenance Review		■	■	
EM 01-005	Site Closure Plan	■	■	■	
EM 02-001	Emergency Procedure		■		■
EM 02-002	Incident and Near Miss Procedure		■		
EM 02-003	Waste Acceptance Procedure v2	■			
EM 02-004	Waste Storage and Dispatch Procedure v2		■	■	■
EM 02-005	Odour Assessment Procedure			■	
EM 02-006	Fire Control Procedure ***(see also FPP)***			■	■
EM 02-007	Spill Control Procedure			■	
EM 02-008	Delivery Procedure	■	■	■	
EM 02-009	Hazardous Materials Storage Procedure (2)	■	■	■	
EM 02-010	New Projects Procedure				■
EM 02-011	Document Control Procedure				■
EM 02-012	Complaints Procedure				■
EM 02-013	Noise Assessment Procedure		■	■	
EM 02-014	Dust Control Procedure V2		■	■	
EM 02-015	Severe Weather Procedure		■	■	
EM 03-001	Incident Report Form				■
EM 03-002	Corrective Action Report Form				■
EM 03-003	Odour Monitoring Form		■	■	
EM 03-004	Noise Monitoring Form		■	■	
EM 03-005	Underground Vessel Inspection Form		■	■	
EM 03-006	Daily Site Inspection Form v4		■	■	
EM 03-007	Weekly Site Inspection Form		■	■	
EM 03-008	Document Control Update Form				■
EM 04-001	EA Notification Form				■
EM 05-001	Emergency Contact List v2				■

EM 05-002	Waste Vessel Schedule V2				
EM 05-003	Bulk Storage Schedule				
EM 05-004	PPM Schedule				
EM 05-005	Inspection Schedule				
EM 05-006	Sensitive Receptor Schedules				
EM 06-001	Sensitive Receptor Plan				
EM 06-002	Odour and Noise Monitoring Location Plan				
EM 06-003	Bulk Storage Plan V3				
EM 06-004	Tank Reference				
EM 07-001	Training - Environmental Permit				
EM 07-002	Environmental Training Record				
EM 07-003	Training Assessment				
EM 07-004	Training Matrix				

5.11 Accident Prevention

As part of the environmental permit consolidation application for Ellgia Scunthorpe waste and recycling facility, the permit holder must assess the risk and determine if accident or emergency situations may impact on any receptors located within proximity of the facility boundary.

The Accident Management Plan (AMP) has been developed in accordance with the online Environment Agency Guidance for undertaking environmental risk assessments.

The accident management plan will be regularly reviewed and updated, as required.

Incidents and near misses will be recorded and investigated with any remedial and preventative measures undertaken in accordance with this plan and the site management plan.

If an accident occurs which has the potential to cause an adverse environmental impact, the permit holder will:

- Immediately follow the requirements of the Accident Management Plan
- Undertake all actions necessary to minimise the environmental consequences
- Take all precautions to ensure that health and safety of employees, contractors, customers and other third parties.
- Investigate the reasons and circumstances as to why the accident happened and implement actions to prevent reoccurrence.
- Review the accident management plan at regular intervals (at least every two years).

The assessment of risks associated with potential accident or emergency situations has been undertaken in accordance with the Environment Agency Guidance. The guidance document requires that the Accident Management Plan must fulfil the following four key requirements:

- Identifies events or failures that could damage the environment.

- Assesses how likely they are to happen and the potential environmental consequences.
- Actions to minimise the potential causes and consequences of accidents.
- The actions that are required to be carried out if an accident happens.

The AMP aims to fulfil these requirements, the AMP has been submitted as a separate document, reference ELL_022.

6 Infrastructure and Drainage Arrangements

6.1 Infrastructure

The site infrastructure and drainage arrangements are shown in the plans contained in document ELL/006.

6.2 Drainage

Operational areas are located on impermeable concrete surfaces, with sealed drainage systems.

All waste, with the exception of securely baled and wrapped SRF, RDF and Recycled material awaiting despatch is stored inside a building, process line or under a fixed canopy.

There are no discharges of water from the processes operated on site. Emissions are generated only from rainfall.

The site is not connected to the public sewer network. All water discharge is via full retention separators, this in conjunction with good housekeeping measures, including daily road and yard sweeping, ensures that water emissions to ground and watercourse are very unlikely to be contaminated.

Water from full retention separators drain to a site drainage pond and from there to Frodingham Ponds via 450mm culvert. The site drainage pond can be isolated from the watercourse by penstock valve, see ELL/006c and ELL/006d.

There are no relevant hazardous substances released to groundwater from the installation. The EMS and risk assessment identify any further potential risk to groundwater and how these are prevented.

The site drainage scheme has been in operation for many years and there is no evidence of any ground water contamination. Extensive ground and water investigations undertaken for planning consent showed no signs of water contamination including in the main site drainage pond.

An emergency spill procedure EM-02-007, will be implemented to respond to any spillages.

Additionally, related to Ellgia's proposed activities, there will be no process contributions to foul water. All site welfare facilities and toilets are connected to sealed cesspits.

6.3 Site Inspections

A regular site inspection and maintenance programme is in place, site checks are undertaken on a daily and weekly basis, inspections sheets EM-03-006 and EM-03-007 are part of the EMS, to ensure that the infrastructure is maintained in good condition and any potential operational or compliance issues are detected immediately. Inspections include but are not limited to the condition and operating performance of

- impermeable hardstanding.
- drainage system
- storage bays and firewalls and push walls
- firm detectors and suppression systems
- sit site walls, fences and gates
- storage vessels and containers

The results of these checks are recorded, with details of any remedial action and maintenance that may be required in order to ensure good condition included in the record form.

6.4 Security

The site is bounded by a combination of security fences and deep dykes. Out of hours gates are locked and access is control by security personnel.

The site is equipped with a 32 channel 24-hour CCTV system, which provides coverage of the whole site. Cameras can be controlled remotely to pan and zoom in or out to investigate anything suspicious or unusual. The system is monitored during working hours by office and operations staff and can be reviewed remotely by phone, tablet, or PC.

6.5 Records and Reports

Systems are in place to hold all the information generated during the pre-acceptance, acceptance, storage, treatment and removal off site.

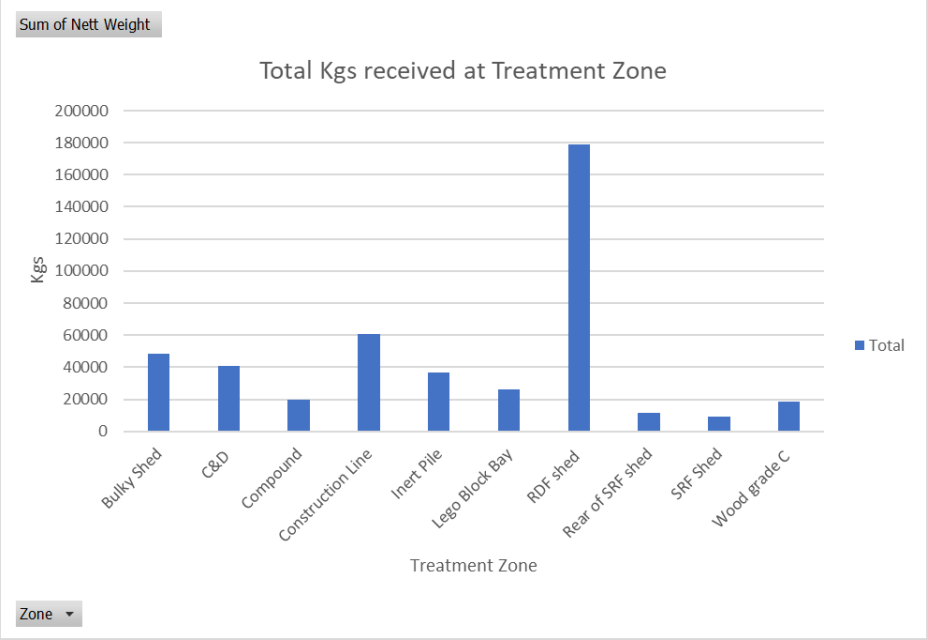
Records are made and kept up to date on an ongoing basis to reflect deliveries, on-site treatment and despatches. The weighbridge data management system – VWS Software Solutions (PurGo) includes:

- date of arrival on-site;
- producers details;
- all previous holders;
- a unique reference number;
- pre-acceptance and acceptance analysis results;
- load/package type and size;
- intended treatment/disposal route;
- the nature and quantity of all wastes held on site (this includes all hazards);
- the physical location of the wastes in relation to the site layout plan;
- where the waste is in the designated disposal route; and
- identification of site staff who have taken any decisions regarding the acceptance or rejection of waste streams and the recovery or disposal options.

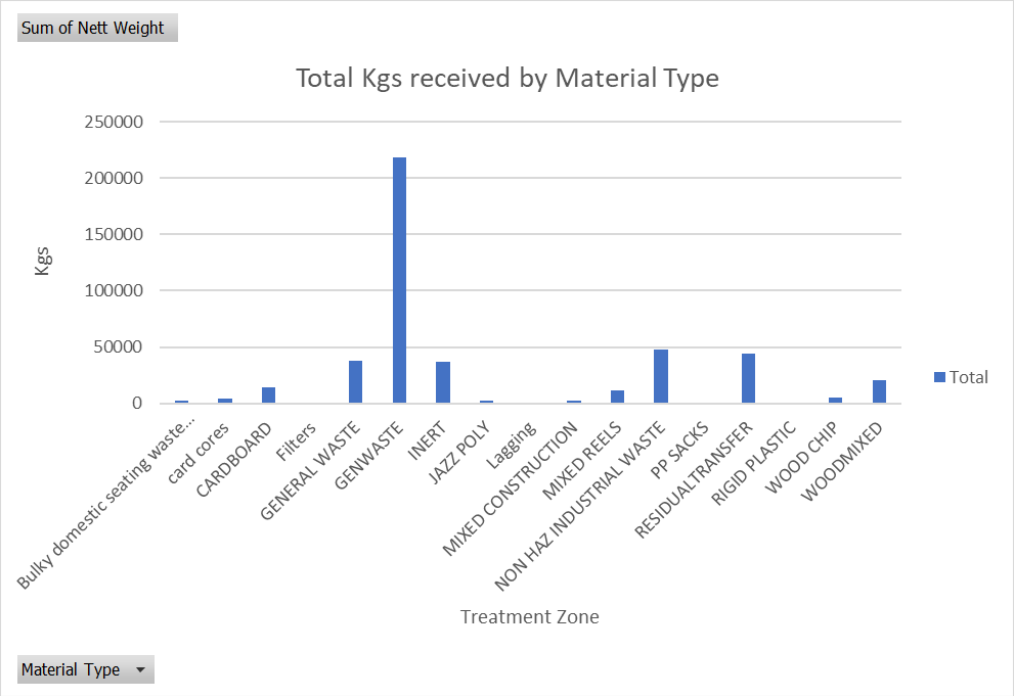
The reporting system can provide reports on the following:

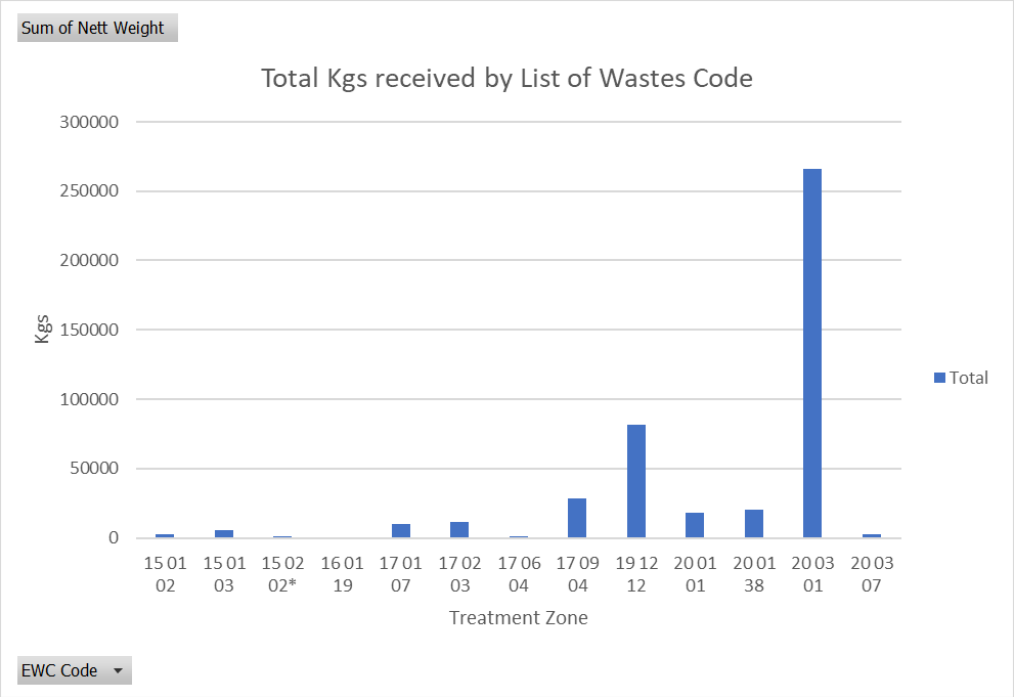
- the total quantity of waste present on site at any one time;
- a breakdown of the waste quantities being stored pending on-site treatment, classified by treatment route;
- breakdown of waste quantities on site for storage pending onward transfer;
- breakdown of waste quantities by hazard classification;
- the physical locations of the waste in relation to the site layout plan;
- a comparison of the quantity of waste stored on site against the total permitted to be stored; and
- a comparison of the time the waste has been stored on site against the permitted limit.

Example of Reporting Data



Example of Reporting Data





All records are stored in the office for a minimum of 5 years.

6.6 Emissions

See separate document ELL/018 Point source Emissions document.

7 Compliance with BAT Conclusion

7.1 Overview

It is considered that the techniques that will be in use at the proposed Installation will constitute Best Available Techniques ("BAT") and will be appropriate and proportionate for the scale of the activities at the Installation and the risks that are posed to the environment by these activities.

The BAT Requirements for the proposed Installation have been taken from the EA's Sector Guidance Note IPPC S5.06 'Guidance for the Recovery and Disposal of Hazardous and Non-Hazardous Waste' (Issue 5, Date 2013).

The Waste Treatment ("WT") BREF (October 2018), which includes the applicable BAT Conclusions, has been taken into consideration in the preparation of this application.

In addition, where necessary, reference has been made to the EA's online webpage guidance, such as 'Develop a management system: environmental permits' (December 2019) and 'Control and monitor emissions for your environmental permit' (February 2020).

A demonstration of compliance with applicable BAT is provided below it refers to both the WT BREF BAT Conclusions and the associated guidance within IPPC S5.06.

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WT BREF BAT Ref No.	IPPC S5.06 BAT Ref No.	BAT Requirement	Reference
2 & 40	*IPPCS5.06, Section 2.1.1, Pre-Acceptance Procedures to Assess Waste*		
	1	From the waste disposal enquiry, the Operator should obtain information in writing relating to: • The type of process producing the waste. • The specific process from which the waste derives. • The quantity of waste; • Chemical analysis of the waste (individual constituents and as a minimum their percentage compositions); • The form the waste takes (solid, liquid, sludge etc.); • Hazards associated with the waste; and • Sample storage and preservation techniques.	Pre-acceptance procedure 5.3 and EMS ELL/005
	2	Unless a sample and analysis has already been completed by a third party and the Operator has a sufficient written information from them, then the Operator should in every case obtain representative sample(s) of the waste from the production process/current holder and compare it against the written description to ensure it is consistent.	
	3	Other than for pure product chemicals or laboratory smalls, the chemical analysis should relate to an actual analysis and not simply be based on product data sheets or an extrapolation of information on product data sheets. For example, taking the concentrations as specified and applying a dilution factor is not acceptable.	
	4	Wastes should not be accepted at the installation without a clear method or defined treatment and disposal route being determined in advance and costed before the waste is accepted at the installation.	
	5	The Operator should ensure that the sample is representative of the waste and has been obtained by a person who is technically competent to undertake the sampling process.	

WT BREF BAT Ref No.	IPPC S5.06 BAT Ref No.	BAT Requirement	Reference
2 & 40	*IPPCS5.06, Section 2.1.1, Pre-Acceptance Procedures to Assess Waste*		
	6	The type of information that would demonstrate the reliability of the sample includes: • Location of sample point, for example, effluent tank; • Capacity of vessel sampled (for samples from drums an additional parameter would be the total number of drums); • Method of sampling, e.g. sampling tap (mid flow), "top" sample; • Number of samples and degree of consolidation; • Operating conditions at time e.g. normal operation, shut-down, maintenance and/or cleaning; and • Preservation techniques.	Pre-acceptance procedure 5.3 and EMS ELL/005 Sampling procedures 5.9
	7	Samples should be clearly labelled and any hazard identified.	
	8	Sample tracking systems within the installation should be established and be auditable.	
	9	Analysis should be carried out by a laboratory with robust quality assurance and quality control methods and record keeping.	
	10	Analysis required will vary depending upon the nature of the waste, the process to be used and what is known about the waste already. Results of analysis should be kept within the tracking system. These details should include: • Check on constituents declared by waste producer/holder to ensure Permit compliance, treatment plant specification and final disposal; • All hazardous characteristics; • Physical appearance; • Colour; • pH; • presence, strength and description of odour assessment (note COSHH implications).	

WT BREF BAT Ref No.	IPPC S5.06 BAT Ref No.	BAT Requirement	Reference
2 & 40	*IPPCS5.06, Section 2.1.1, Pre-Acceptance Procedures to Assess Waste*		
	14	Following characterisation of the waste, a technical assessment should be made of its suitability for treatment or storage to ensure Permit conditions are being met.	Pre-acceptance procedure 5.3 and EMS ELL/005 Sampling procedures 5.9
	15	There must be a clear distinction between sales and technical staff roles and responsibilities. If non-technical sales staff are involved in waste disposal enquiries, then a final technical assessment prior to approval should be made. It is this final technical checking that should be used to avoid build-up of accumulation of waste.	
	16	All records relating to pre-acceptance should be maintained at the installation for cross-reference and verification at the waste acceptance stage. These records should be kept for a minimum of 3 years.	
2, 5 & 40	*IPPCS5.06, Section 2.1.2, Acceptance Procedure When Waste Arrives at The Installation*		
	Load Arrival		
	1	On arrival loads should: • be weighed, unless alternative reliable volumetric systems linked to specific gravity data are available; • not be accepted into site unless sufficient storage capacity exists and site is adequately manned to receive waste; • have all documents checked and approved, and any discrepancies resolved before the waste is accepted; and • have any labelling that does not relate to the contents of the drum removed before acceptance on site. Load Inspection	Acceptance procedure 5.4 and EMS ELL/005 .
	3	Visual inspection. Where possible, confirmatory checks should be undertaken before offloading where safety is not compromised. Inspection must in any event be carried out immediately upon offloading at the installation.	
	7	The inspection, unloading and sampling areas should be marked on a plan and have suitably sealed drainage systems.	Acceptance procedure 5.4 and EMS ELL/005

WT BREF BAT Ref No.	IPPC S5.06 BAT Ref No.	BAT Requirement	Reference
2, 5 & 40	*IPPCS5.06, Section 2.1.2, Acceptance Procedure When Waste Arrives at The Installation*		
	Sampling – checking - testing of wastes - storage		
	8	Other than pure product chemicals and laboratory smalls, no wastes should be accepted at the installation without sampling, checking and testing being carried out. Reliance solely on the written information supplied is not acceptable, and physical verification and analytical confirmation are required. All wastes, whether for on-site treatment or simply storage, must be sampled and undergo verification and compliance testing.	
	9	The Operator should ensure that waste delivered to the installation is accompanied by a written description of the waste describing: • the physical and chemical composition. • hazard characteristics and handling precautions. • compatibility issues; and • information specifying the original waste producer and process.	Acceptance procedure 5.4 and EMS ELL/005.
2, 5, 26 & 40	10	On-site verification and compliance testing should take place to confirm: • the identity of the waste; • the description of the waste • consistency with pre-acceptance information and proposed treatment method; and • compliance with permit.	
	11	The Operator should have clear and unambiguous criteria for the rejection of waste, together with a written procedure for tracking and reporting such non-conformance. This should include notification to the customer/waste producer and the Regulator. Written/computerised records should form part of the waste tracking system information.	

WT BREF BAT Ref No.	IPPC S5.06 BAT Ref No.	BAT Requirement	Reference
2, 5 & 40	*IPPCS5.06, Section 2.1.2, Acceptance Procedure When Waste Arrives at The Installation*		
	12	Documentation provided by the driver, written results of acceptance analysis, details of offloading point or off-site transfer location should be added to the tracking system documentation.	
	13	A record of sampling regime for each load and justification for the selection of this option should be maintained at the installation.	
	14	Wastes must not be deposited within a reception area without adequate space.	
	16	Should the inspection or analysis indicate that the wastes fail to meet the acceptance criteria (including damaged or unlabelled drums), and then such loads should be stored in a dedicated quarantine area and dealt with appropriately. Such storage should be more a maximum of five working days. Written procedures should be in place for dealing with wastes held in quarantine, together with a maximum storage volume.	
	17	If the cause of failure to meet acceptance criteria is due to incompatibility, then the wastes should be segregated immediately to remove the hazard.	
	20	The installation should have a designated sampling point or reception area. These should be in close but safe proximity to the laboratory/checking facility and the sampling point should be visible (or covered by CCTV), if sampling is not directly supervised by, for example, laboratory staff.	Acceptance procedure 5.4 and EMS ELL/005
	21	The offloading, sampling point/reception and quarantine areas should have impervious surface with self-contained drainage, to prevent any spillage entering the storage systems or escaping off-site. Most spills and leaks during sampling are on a small scale, resulting from releases from the back valve of a tanker if the sample is being obtained in this way. Attention should be given to ensuring that incompatible substances do not come into contact resulting from spills from sampling, for example, within a sump serving the sampling point. Absorbents should be made available.	
	Waste Rejection Procedures		
	34	The operator should have clear and unambiguous criteria for the rejection of wastes, together with a written procedure for tracking and reporting such non-conformance. This should include notification to the customer/waste producer and the Environment Agency.	

WT BREF BAT Ref No.	IPPC S5.06 BAT Ref No.	BAT Requirement	Reference
2 & 5	34 (Cont.)	Written/computerised records should form part of the waste tracking system information. The operator should also have a clear and unambiguous policy for the subsequent storage and disposal of such rejected waste. This policy should achieve the following: • identifies the hazards posed by the rejected wastes; • labels rejected wastes with all information necessary to allow proper storage and segregation arrangements to be put in place; and • segregates and stores rejected wastes safely pending removal.	Section 6.5 and EMS ELL/005.
	Records		
	35	The waste tracking system should hold all the information generated during pre-acceptance, acceptance, storage, treatment and/or removal off-site. Records should be made and kept up to date on an ongoing basis to reflect deliveries, on-site treatment and despatches. The tracking system should operate as a waste inventory/stock control system and include as a minimum: - date of arrival on-site; - producers' details; - all previous holders; - a unique reference number; - pre-acceptance and acceptance analysis results; - package type and size; - intended treatment/disposal route; - record accurately the nature and quantity of wastes held on site, including all hazards and identification of primary hazards; - where the waste is physically located in relation to a site plan; - where the waste is in the designated disposal route; and - identification of operator staff that have taken any decisions re acceptance or rejection of waste streams and decided upon recovery/disposal options.	Section 6.5 and EMS ELL/005.

WT BREF BAT Ref No.	IPPC S5.06 BAT Ref No.	BAT Requirement	Reference
2	36	All records relating to pre-acceptance should be maintained and kept readily available at the installation for cross-reference and verification at the waste acceptance stage. Records should be held for a minimum of two years after the waste has been treated or removed off-site. Records should be held in an area well removed from hazardous activities to ensure their accessibility. during any emergency.	Section 6.5 and EMS ELL/005.
	37	The system adopted should be capable of reporting on all of the following: o total quantity of waste present on-site at any one time, in appropriate units; o breakdown of waste quantities being stored pending on site treatment, classified by treatment route; o indication of where the waste is located on site relative to the site plan; o comparison of the quantity on site against total permitted; o comparison of time the waste has been on-site against permitted limit. These records should be held in a designated area, as agreed with the Agency, well removed from hazardous activities to ensure their accessibility during any emergency.	Section 6.5 and EMS ELL/005.
	38	Back-up copies of computer records should be maintained off-site.	
	39	Wastes should not be accepted at the Installation without a clear defined method of recovery or disposal being determined and costed and ensuring there is sufficient capacity being available. These checks should be performed before the waste acceptance phase.	5.3/5.4/ ELL/005
	44	There must be a clear distinction between sales and technical staff roles and responsibilities. If non-technical sales staff are involved in waste enquiries then a final technical assessment prior to approval should be made. It is this final technical checking that should be used to avoid build up of accumulation of wastes and to ensure that sufficient capacity exists.	

WT BREF BAT Ref No.	IPPC S5.06 BAT Ref No.	BAT Requirement	Reference
	IPPC S5.06, Section 2.1.3, Waste Storage		
2 & 4	**Offloading/discharge of waste**		
	1	The Operator should have in place a system to ensure that the correct discharge point or storage area is used. The options for this include: • ticket systems; • supervision by site staff and if relevant CCTV; • keys; and • colour-coded points/hoses or fittings of a specific size.	Section 6.4, 6.5 FPP ref: SCU/FPP/002 EMS ELL/005
	2	Offloading and quarantine points should have an impervious surface with self-contained drainage, to prevent any spillages entering the storage systems or escaping off-site.	
	5	The Operator should have an internal tracking system which should satisfy the objectives and minimum standards given at Section 2.1.2 (IPPC S5.06).	See FPP: SCU/FPP/002 Plans ELL/006
	6	Storage areas are often the most visible aspects of the installation. Storage areas should be located away from watercourses and sensitive perimeters, for example, those which may be adjacent to public rights of way, housing or schools, and within the security-protected area of the installation to prevent vandalism.	
	7	Storage areas should be located to eliminate or minimise the double handling of wastes within the installation.	

WT BREF BAT Ref No.	IPPC S5.06 BAT Ref No.	BAT Requirement	Reference
2 & 4	*IPPCS5.06, Section 2.1.3, Waste Storage (Cont.)*		
	9	The total maximum storage capacity of the site should be clearly and unambiguously stated in writing, accompanied with details of the method used to calculate the volumes held against this maximum and set out in the site plan. The stated maximum capacity of storage areas should not be exceeded and the site plan updated to reflect any changes before they are implemented.	Section 3 See FPP: SCU/FPP/002 Plans ELL/006
	11	Storage area drainage infrastructure should ensure that all contaminated run-off is contained, that drainage from incompatible wastes cannot come into contact with each other and that fire cannot spread between storage / treatment areas via the drainage system.	
	12	Procedures must be in place for the regular inspection and maintenance of storage areas, including drums, vessels, pavements and bunds. Inspections should pay particular attention to signs of damage, deterioration and leakage. Records should be kept detailing action taken. Faults must be repaired as soon as practicable. If containment capacity or capability of bund, sump or pavement is compromised, (unless effecting a repair is more expedient and working with wastes in close proximity does not compromise safety), then waste must be immediately removed until the repair is completed.	Section 6.3 and EMS ELL/005.
	15	There should be vehicular, for example, forklift, and pedestrian access at all times to the whole of the storage area	see plans
	16	All spillages of hazardous wastes should be logged, where spillages >200 litre then additionally the Regulator should be informed.	Fire prevention plan SCU/FPP/002 Accident Management Plan: Ell/022
	17	Activities that create a clear fire risk should not be carried out within the storage area, even if it is not formally classified as hazardous. Examples include grinding, welding or brazing of metalwork, smoking, parking of normal road vehicles except while unloading, charging of the batteries of ieds.	
	Turnover		
	18	Storage within the reception area should be for a maximum of five working days. Following receipt, wastes should be treated or removed off-site as soon as possible. The total storage time will depend upon the characteristics of a particular site and the waste types being stored.	Section 5

WT BREF BAT Ref No.	IPPC S5.06 BAT Ref No.	BAT Requirement	Reference
2 & 4	Compatibility Testing		
	31	In order to prevent any adverse or unexpected reactions and releases before transfer involving the following activities, testing should take place prior to the transfer: • tanker discharge to bulk storage • tank-to-tank transfer • transfer from container to bulk tank • bulking into drums/IBCs • bulking of solid waste into drums or skips	Not applicable.
2, 4 & 12	32	Any evolved gases and cause of odour should be identified. If any adverse reaction is observed, an alternative discharge or disposal route should be found.	
	Transfer from tanker, drums and other containers in bulk storage		
1	33	Due consideration should be taken of the implications of scale-up from laboratory compatibility testing to bulk transfer and the Guidance is given in HSG143	Risk assessments ELL/012
	34	Wastes in containers should be transferred into storage vessels by dip pipe to minimise splash, fume and odour	
	35	Transfer/discharge should only take place after compatibility testing has been completed and then only with the sanction of an appropriate manager. Approval should specify which batch/ load of material is to be transferred, the receiving storage vessel, equipment required, including spillage control and recovery equipment, and any special provisions relevant to that batch/load	
	38	If flammable chemicals are being transferred, particular caution has to be taken to avoid the generation of static electricity, with the subsequent risk of ignition.	
	39	A representative sample of the receiving tank/vessel/container should be mixed in a proportional ratio with a sample of incoming waste stream that it is proposed to add to the tank/ vessel/container.	

WT BREF BAT Ref No.	IPPC S5.06 BAT Ref No.	BAT Requirement	Reference
1	*Bulk Storage Vessels*		
	44	Bulk storage vessels should be located on an impervious surface that is resistant to material being stored, with sealed construction joints within a bunded area with a capacity at least 110% of the largest vessel or 25% of the total tankage volume, whichever is the greater	Site Risk assessments, environmental risk assessment: ELL/012 EMS ELL/005
	45	Vessels supporting structures, pipes, hoses and connections should be resistant to the substances (and mix of substances) being stored. There should be a routine programmed inspection of tanks, mixing and reaction vessels including periodic thickness testing. In the event of damage or significant deterioration being detected, the contents should be transferred to appropriate storage. These inspections should preferably be carried out by independent expert staff, and written records should be maintained of the inspection and any remedial action taken	
	46	Vessels should not be used beyond the specified design life or used in a manner or for substances that they were not designed, Vessels should be inspected at regular intervals, with written records kept to prove that they remain fit for purpose. See HSE Guidance Note PM75.	
	47	As a general rule, no open-topped tanks, vessels or pits should be used for storage or treatment of hazardous or liquid wastes. Exceptions would require justification in the permit application.	
	48	No uncontrolled venting to atmosphere should be allowed, and all vents should be linked to suitable scrubbing and abatement systems. Vapour balance lines should be connected to suitable abatement systems.	
	49	Tank and vessel optimum design should be considered in each case, taking into account waste type, storage time, overall tank design and mixing system to prevent sludge accumulation and to ease desludging. Storage and treatment vessels should be regularly desludged.	
	50	Tanks and vessels should be equipped with suitable abatement systems and level meters with both audible and visual high-level alarms. These systems should be sufficiently robust and regularly maintained to prevent foaming and sludge build-up affecting the reliability of the gauges.	
	51	Storage vessels holding flammable or highly flammable wastes should meet the requirements of HSG51, HSG140, HSG716 and HSG176	

WT BREF BAT Ref No.	IPPC S5.06 BAT Ref No.	BAT Requirement	Reference
1	52	All connections between vessels must be capable of being closed via suitable valves. Overflow pipes should be directed to a contained drainage system, which may be the relevant bunded area, or to another vessel provided suitable control measures are in place.	
	53	Underground or partially underground vessels without secondary containment should be scheduled for replacement with above-ground structures, for example, double-skinned vessels with leakage detection.	
	54	Plant and equipment taken out of use should be decontaminated and removed	
	55	Pipework should preferably be routed above ground; if below ground it should be contained within suitable inspection channels.	
	Tank and Process Pipework Labelling		
	58	All vessels should be clearly signed as to their contents and capacity and should have a unique identifier. Tanks should be appropriately labelled	
	59	Labelling should differentiate between wastewater and raw process water, combustible liquid and combustible vapour and direction of flow	Site Risk assessments, environmental risk assessment: ELL/012 EMS ELL/005 Section 4.2 PPMR
	60	Written records of all tanks should be kept detailing: • unique identifier • capacity • construction including materials • maintenance schedules and inspection results • fittings (including joints and gaskets etc.) • waste types that may be stored/treated in the vessel including flashpoint limit.	
	61	A suitable pipework coding system should be used, for example, RAL European standard colour coding.	
	62	All valves should be tagged with a unique identifier shown on the process and instrumentation diagram. All connections should be correctly sized and maintained in an undamaged state.	
	Other Storage Requirements		
4	63	Waste or raw materials in non-waterproof packaging should be kept under cover.	

WT BREF BAT Ref No.	IPPC S5.06 BAT Ref No.	BAT Requirement	Reference
	Container Movement		
2 & 4	64	Drums and other mobile containers should only be moved between different locations (or loaded for removal off-site) in accordance with written procedures. The waste tracking system should then be amended to record these changes	Site Risk assessments, environmental risk assessment: ELL/012 EMS ELL/005
		IPPCS5.06, Section 2.2.4, Fugitive Emissions to Air	
14 & 41	1	Dust - The following general techniques should be employed where appropriate: • covering of skips and vessels • avoidance of outdoor or uncovered stockpiles (where possible) • where dust creation is unavoidable, use of sprays, binders, stockpile management techniques, windbreaks and so on • regular wheel and road cleaning (avoiding transfer of pollution to water and wind blow) • closed conveyors, pneumatic or screw conveying (noting the higher energy needs), minimising drops. Filters on the conveyors to clean the transport air prior to release • regular housekeeping.	Site Risk assessments, environmental risk assessment: ELL/012 EMS ELL/005 Section 4.2 PPMR ELL/017 and ELL/018, Emissions management plan and point source emissions
		IPPCS5.06, Section 2.2.5, Fugitive Emissions to Surface Water, Sewer and Groundwater	
21	3	For surfacing: • design appropriate surfacing and containment or drainage facilities for all operational areas, taking into consideration collection capacities, surface thicknesses, strength/reinforcement; falls, materials of construction, permeability, resistance to chemical attack, and inspection and maintenance procedures; • have an inspection and maintenance programme for impervious surfaces and containment facilities; • unless the risk is negligible, have improvement plans in place where operational areas have not been equipped with: • an impervious surface • spill containment kerbs • sealed construction joints – connection to a sealed drainage system.	

WT BREF BAT Ref No.	IPPC S5.06 BAT Ref No.	BAT Requirement	Reference
		PPCS5.06, Section 2.2.5, Fugitive Emissions to Surface Water, Sewer and Groundwater (Cont.)	
21	4	All above-ground tanks containing liquids whose spillage could be harmful to the environment should be bunded. Bunds should: • be impermeable and resistant to the stored materials; • have no outlet (that is, no drains or taps) and drain to a blind collection point; • have pipework routed within bunded areas with no penetration of contained surfaces; • be designed to catch leaks from tanks or fittings; • have a capacity greater than 110 percent of the largest tank or 25 percent of the total tankage, whichever is the larger; • be subject to regular visual inspection and any contents pumped out or otherwise removed • under manual control after checking for contamination; • where not frequently inspected, be fitted with a high-level probe and an alarm, as appropriate; • where possible, locate tanker connection points within the bund, otherwise provide adequate containment; • be subject to programmed engineering inspection (normally visual, but extending to water testing where structural integrity is in doubt).	Site Risk assessments, environmental risk assessment: ELL/012 EMS ELL/005 Section 4.2 PPMR ELL/017 and ELL/018, Emissions management plan and point source emissions
		IPPCS5.06, Section 2.2.6., Odour	
10, 12 & 13	*1*	The requirements for odour control will be installation-specific and depend on the sources and nature of the potential odour. In general:	Odour Management Pan: EMS 03-003 ELL/017 and ELL/018, Emissions management plan and point source emissions
	2	Where odour can be contained, for example within buildings, the Operator should maintain the containment and manage the operations to prevent its release at all times.	
	4	Where odour generating activities take place in the open, (or potentially odorous materials are stored outside) a high level of management control and use of best practice will be expected.	
	6	The objective is to prevent emissions of odorous releases that are offensive and detectable beyond the site boundary. This may be judged by the likelihood of complaints. However, the lack of complaint should not necessarily imply the absence of an odour problem.	
	7	Assessment of odour impact should cover a range of reasonably foreseeable odour generation and receptor exposure scenarios, including emergency events and the effect of different mitigation options.	

WT BREF BAT Ref No.	IPPC S5.06 BAT Ref No.	BAT Requirement	Reference
IPPCS5.06, Section 2.2.6., Odour			
10, 12 & 13	*8*	For complex installations, for example where there are a number of potential sources of odorous releases or where there is an extensive programme of improvements to bring odour under control, an odour management plan should be maintained.	Odour Management Pan: EMS 03-003 ELL/017 and ELL/018, Emissions management plan and point source emissions
	9	Emphasis should be placed on pre-acceptance screening (see Section 2.1.1 on page 20) and the rejection of specific wastes, for example, mercaptans, low molecular weight amines, acrylates or other similarly highly odorous materials, that are only suitable for acceptance under special handling requirements. These may include dedicated sealed handling areas with extraction to abatement.	
IPPCS5.06, Section 2.3., Management			
		Operation and Maintenance	
1	*1*	Effective operational and maintenance systems should be employed on all aspects of the process whose failure could impact on the environment, in particular there should be: • documented procedures to control operations that may have an adverse impact on the environment; • a defined procedure for identifying, reviewing and prioritising items of plant for which a preventative maintenance regime is appropriate; and • documented procedures for monitoring emissions or impacts • a preventative maintenance programme covering all plant, whose failure could lead to impact on the environment.	Planned Preventative Maintenance Regime
	2	The maintenance system should include auditing of performance against requirements arising from the above and reporting the result of audits to top management.	

WT BREF BAT Ref No.	IPPC S5.06 BAT Ref No.	BAT Requirement	Reference
IPPCS5.06, Section 2.3., Management (Cont.)			
		Competence and Training	
1	3	Training systems, covering the following items, should be in place for all relevant staff which cover: • awareness of the regulatory implications of the Permit for the activity and their work activities; • awareness of all potential environmental effects from operation under normal and abnormal circumstances • awareness of the need to report deviation from the Permit; and • prevention of accidental emissions and action to be taken when accidental emissions occur.	
	4	The skills and competencies necessary for key posts should be documented and records of training needs and training received for these posts maintained.	Section 4 and EMS/ ISO 14001 implementation
	5	The key posts should include contractors and those purchasing equipment and materials;	
	6	The potential environmental risks posed by the work of contractors should be assessed and instructions provided to contractors about protecting the environment while working on site.	Accident management Plan, COTC structure
	7	Where industry standards or codes of practice for training exist (e.g. WAMITAB) they should be complied with.	
		Accidents/non-conformances	EMS ELL/005
	8	There should be an accident plan which: • identifies the likelihood and consequence of accidents; and • identifies actions to prevent accidents and mitigate any consequences	EM-04-001 EA notification form
	9	There should be written procedures for handling, investigating, communicating and reporting actual or potential non-compliance with operating procedures or emission limits	
	10	There should be written procedures for handling, investigating, communicating and reporting environmental complaints and implementation of appropriate actions.	

WT BREF BAT Ref No.	IPPC S5.06 BAT Ref No.	BAT Requirement	Reference
IPPCS5.06, Section 2.3., Management (Cont.)			
1	11	There should be written procedures for investigating incidents, (and near misses) including identifying suitable corrective action and following up.	Accident Management Plan.
		Organisation	
	12	The following are indicators of good performance which may impact on the Regulator's resources, but not all will necessarily be insisted upon as Permit Conditions:	
	13	The company should adopt an environmental policy and programme which: • includes a commitment to continual improvement and prevention of pollution; • includes a commitment to comply with relevant legislation and other requirements to which the organisation subscribes; and • identifies, sets, monitors and reviews environmental objectives and key performance indicators independently of the Permit.	Environmental Policy ISO 140001 implementation
	14	The company should have demonstrable procedures (e.g. written procedures) which incorporate environmental considerations into the following areas: • the control of processes and engineering change on the installation; • design, construction and review of new facilities and other capital projects (including provision of decommissioning) • capital approval; and • purchasing policy.	EMS ELL/005 EM-04-001 EA notification form
	15	The company should conduct audits, at least annually, to check that all activities are being carried out in conformity with the above requirements. Preferably, these should be independent.	

WT BREF BAT Ref No.	IPPC S5.06 BAT Ref No.	BAT Requirement	Reference
IPPCS5.06, Section 2.3., Management (Cont.)			
1	16	The company should report annually on environmental performance, objectives and targets, and future planned improvements. Preferably, these should be published environmental statements.	Environmental Policy
	17	The company should operate a formal Environmental Management System. Preferably, this should be registered or certified EMS/ISO 140001 system (issued and audited by an accredited certification body).	ISO 140001 implementation
	18	The company should have a clear and logical system for keeping records of, amongst others: • policies; • roles and responsibilities; • targets; • procedures; • results of audits; • results of reviews.	EMS ELL/005 EM-04-001 EA notification form
IPPCS5.06, Section 2.4., Raw Materials			
11	1	The Operator should maintain a list of raw materials and their properties as noted above.	PPMP
	2	The Operator should have procedures for the regular review of new developments in raw materials and for the implementation of any suitable ones with an improved environmental profile.	
	3	The Operator should have quality-assurance procedures for controlling the impurity content of raw materials.	
	4	The Operator should complete any longer-term studies needed into the less polluting options and should make any material substitutions identified.	

WT BREF BAT Ref No.	IPPC S5.06 BAT Ref No.	BAT Requirement	Reference
IPPCS5.06, Section 2.6., Waste Recovery or Disposal			
11	1	Waste production should be avoided wherever possible. Any waste that is produced should be recovered, unless it is technically or economically impractical to do so.	EMS
	2	Where waste must be disposed of, the Operator should provide a detailed assessment identifying the best environmental options for waste disposal – unless the Regulator agrees that this is unnecessary. For existing disposal activities, this assessment may be carried out as an improvement condition to a timescale to be approved by the Regulator.	
	Contaminated Containers		
24 & 26	5	Most drums and IBC's are designed, manufactured and marked to enable reconditioning/refurbishment. As such, 250l drums, 800l and 1000l IBCs should be cleaned and reconditioned to enable re-use where technically and economically possible.	EMS
	6	Containers that cannot be re-used where there is no reconditioning market and which have been cleaned can be released into the secondary materials market.	
IPPCS5.06, Section 2.7., Energy			
11, 23 & 28	1 (1)	The Operator should provide the energy consumption information, shown in the table on page 86 of IPPC S5.06 Sector Guidance Note, in terms of delivered energy and also, in the case of electricity, converted to primary energy consumption.	PPMP and EMS
	2 (1)	The Operator should provide the following Specific Energy Consumption ("SEC") information. Define and calculate the SEC of the activity (or activities) based on primary energy consumption for the products or raw material inputs that most closely match the main purpose or production capacity of the installation. Provide a comparison of SEC against any relevant benchmarks available for the sector.	
	3 (1)	The Operator should provide associated environmental emissions.	
	1 (2)	Operating, maintenance and housekeeping measures should be in place in the following areas, where relevant: • operation of motors and drives; • lubrication to avoid high-friction losses; • boiler operation and maintenance e.g. optimising excess air; and • other maintenance relevant to the activities within the installation.	

WT BREF BAT Ref No.	IPPC S5.06 BAT Ref No.	BAT Requirement	Reference
IPPCS5.06, Section 2.7., Energy			
11, 23 & 28	2 (2)	Basic low-cost physical techniques should be in place to avoid gross inefficiencies. These should include insulation, containment methods (such as seals and self-closing doors) and avoidance of unnecessary discharge of heated water or air (fitting simple control systems such as timers and sensors).	ISO 140001.
	3 (2)	Energy-efficient building services should be in place to deliver the requirements of the Building Services section of the guidance note H2 Energy efficiency for IPPC.	
	4 (2)	Energy management techniques should be in place, noting, in particular, the need for monitoring of energy flows and targeting of areas for reductions.	
	5 (2)	An energy efficiency plan should be provided that: • Identifies all techniques relevant to the installation, • estimates of CO_2 savings that would be achieved by each measure over its lifetime • in the case that the activities are not covered by CCA or DPA, provides information on the equivalent annual costs of implementation of the technique, the costs per tonne CO_2 saved and the priority for implementation.	
	2c	The following techniques should be considered: • use of Combined Heat and Power; • generation of energy from waste; and • use of less polluting fuels.	
	3c	The Operator should provide justification that the proposed or current situation represents BAT, irrespective of whether or not a CCA or DPA is in place, where there are other BAT considerations involved e.g.: • the choice of fuel impacts upon emissions other than carbon dioxide e.g. sulphur dioxide; and • the potential for practical energy recovery from waste conflicts with energy efficiency requirements.	

WT BREF BAT Ref No.	IPPC S5.06 BAT Ref No.	BAT Requirement	Reference
IPPCS5.06, Section 2.8., Accidents			
21	1	A formal structured accident management plan ("AMP") should be in place.	Accident Management Plan ELL/022
	2	The AMP should include: A – Identification of hazards to the environment posed by the installation using a methodology akin to a Hazop study. Areas to consider include, but should not be limited to, the following: • arrangements for the receipt, and checking of incoming wastes, including rejection and quarantine; • arrangements for the storage, segregation and separation of differing waste types; • procedures for the internal transfers, including "bulking up" of waste materials; • transfer of substances (e.g. filling or emptying vessels); • overfilling of vessels; • emissions from plant or equipment (e.g. leaking from joints, over-pressurisation of vessels, blocked drains); • failure of containment (e.g. physical failure or overfilling of bunds or drainage sumps); • failure to contain firewaters; • wrong connections made in drains or other systems; • incompatible substances allowed to come into contact; • unexpected reactions or runaway reactions; • failure of main services (e.g. power, steam, cooling water); • operator error; and • vandalism.	
	3 & 4	B – assessment of the risks. The hazards being identified. The depth and type of assessment will depend on the characteristics of the Installation and its location.	
	5	C – identification of the techniques necessary to reduce the risks. The following techniques are relevant to most installations; there should be an up to date inventory of substances, present or likely to be present, which could have environmental consequences if they escape. This should include apparently innocuous substances that can be environmentally damaging if they escape. The Permit will require the Regulator to be notified of any significant changes to the inventory;	

WT BREF BAT Ref No.	IPPC S5.06 BAT Ref No.	BAT Requirement	Reference
IPPCS5.06, Section 2.8., Accidents (Cont.)			
21	5	• there should be an up-to-date site plan showing the precise location of wastes having specific hazard characteristics (e.g. oxidising, flammable, dangerous when wet etc.) with clear identification of the perimeters of the various designated storage areas and their maximum storage capacity; • procedures should be in place for checking and handling raw materials and wastes to ensure compatibility with other substances with which they may accidentally come into contact; • storage arrangements for raw materials, products and wastes should be designed and operated to minimise risks to the environment; • there should be automatic process controls backed-up by manual supervision, both to minimise the frequency of emergency situations and to maintain control during emergency situations. Instrumentation will include, where appropriate, microprocessor control, trips and process interlocks, coupled with independent level, temperature, flow and pressure metering and high or low alarms; • physical protection should be in place where appropriate (e.g.. barriers to prevent damage to equipment from the movement of vehicles); • there should be appropriate secondary containment (e.g.. bunds, catchpots, building containment); • techniques and procedures should be in place to prevent overfilling of tanks - liquid or powder - (e.g. level measurement displayed both locally and at the central control point, independent high-level alarms, high-level cut-off, and batch metering); • where the installation is situated in a floodplain, consideration should be given to techniques which will minimise the risk of the flooding causing a pollution incident or making one worse; • security systems to prevent unauthorised access should be provided where appropriate; • there should be formal systems for the logging and recording of all incidents, near-misses, abnormal events, changes to procedures and significant findings of maintenance inspections. • there should be procedures for responding to and learning from incidents, near-misses, etc.	Accident Management Plan ELL/022

WT BREF BAT Ref No.	IPPC S5.06 BAT Ref No.	BAT Requirement	Reference
IPPCS5.06, Section 2.8., Accidents (Cont.)			
21	5	• the roles and responsibilities of personnel involved in in incident management should be formally specified. • clear guidance should be available on how each accident scenario might best be managed (e.g. containment or dispersion, to extinguish fires or to let them burn). • procedures should be in place to avoid incidents occurring as a result of poor communications between staff at shift change or during maintenance or other engineering work. • safe shutdown procedures should be in place. • communication channels with emergency services and other relevant authorities should be established, and available for use in the event of an incident. Procedures should include the assessment of harm following an incident and the steps needed to redress this • appropriate control techniques should be in place to limit the consequences of an accident, such as; fire walls, firebreaks isolation of drains, provision of oil spillage equipment, alerting of relevant authorities and evacuation procedures. • personnel training requirements should be identified and training provided. • the systems for the prevention of fugitive emissions are generally relevant and in addition, for drainage systems: o procedures should be in place to ensure that the composition of the contents of a bund sump, or sump connected to a drainage system, are checked before treatment or disposal; o drainage sumps should be equipped with a high-level alarm or with a sensor and automatic pump to storage (not to discharge); o there should be a system in place to ensure that sump levels are kept to a minimum at all times; o high-level alarms and similar back-up instruments should not be used as the primary method of level control. • duplicate or standby plant should be provided where necessary, with maintenance and testing to the same standards as the main plant; • spill contingency procedures should be in place to minimise accidental release of raw materials, products and waste materials and then to prevent their entry into water.	Accident Management Plan ELL/022

WT BREF BAT Ref No.	IPPC S5.06 BAT Ref No.	BAT Requirement	Reference
IPPCS5.06, Section 2.8., Accidents (Cont.)			
21	5	• process waters, potentially contaminated site drainage waters, emergency firewater, chemically-contaminated waters and spillages of chemicals should be contained and, where necessary, routed to the effluent system and treated before emission to controlled waters or sewer. Sufficient storage should be provided to ensure that this can be achieved. Any emergency firewater collection system should take account of the additional firewater flows and fire-fighting foams, and emergency storage lagoons may be needed to prevent contaminated firewater reaching controlled waters • consideration should be given to the possibility of containment or abatement of accidental emissions from vents and safety relief valves/bursting discs. Where this may be inadvisable on safety grounds, attention should be focused on reducing the probability of the emission. • spillage prevention controls must be in place during the transfer of substances (for example, transfer of bulk liquid waste from tanker to storage vessels) o The weakest link and subsequently the main source of spillage during transfer from the vehicle to storage arises from the transfer hoses. This is due to either: o "tanker drive-off" - a vehicle pulling away whilst still coupled (systems should be in place to prevent this); o or because the hose couplings have become damaged or are incompatible. Although the spillages tend to be relatively small, measures should be taken to ensure that the couplings are the correct fit and system. This will prevent the coupling loosening or becoming detached, and in turn will also be helped by the installation providing and maintaining its own hoses. o A more serious event would occur if the coupling were unable to withstand the maximum shut valve pressure of the transfer pump	Accident Management Plan ELL/022

WT BREF BAT Ref No.	IPPC S5.06 BAT Ref No.	BAT Requirement	Reference
IPPCS5.06, Section 2.8., Accidents (Cont.)			
21	5	• Although the volume lost during routine operations due to ill-fitting or damaged hoses may be relatively small, persistent spillage may have a cumulative effect on the surface of the area, which in the long term may damage the surface and lead to a fugitive emission o spillages of this nature may also be a source of odour (see Section 2.2.6 on page 72) and represent poor "housekeeping" practice, requiring constant attention and cleaning. Protection of the transfer hose may not be necessary where a gravity feed system is in place. It will however still be important to maintain a sound coupling at each end of the transfer hose. o a more acute accident situation may arise due to the failure of plant or equipment. This may include the failure of a pump seal or the blockage of a filter pot commonly used at transfer points. The prevention of these situations should be addressed by the provision of routine maintenance. A further type of acute incident is associated with the failure of the seal on the road tanker. The prevention of such an incident is outside the control of the Operator of the installation (though not necessarily beyond that of the company that operates the installation). Some provision should be made within the installation for emergency storage for leaking vehicles. o in addition to accidents connected with some failure in the transfer equipment, measures should be taken to ensure that the correct waste is discharged to the correct transfer point and that the waste is then transferred to the correct storage point. In order to prevent an unauthorised discharge, a lockable isolating valve should be fitted to loading connection. It should be kept locked during periods when there is no supervision of the unloading points. o drainage from discharge points can be connected or transferred to relevant storage for wastes that have been sampled and checked. • unloading/movement of drums and containers • typically drums and containers are delivered on wooden pallets and the pallets are unloaded by forklift. The drums are usually secured together often by shrink-wrap. All pal- lets should be sound and undamaged and forklift drivers should be trained in the handling of palletised goods.	Accident Management Plan Ell/022

WT BREF BAT Ref No.	IPPC S5.06 BAT Ref No.	BAT Requirement	Reference
IPPCS5.06, Section 2.8., Accidents (Cont.)			
21	5	• any damaged pallets should be replaced on arrival and not transferred into storage. Transfer of damaged pallets may lead to other pallets being stored on top, resulting in further damage and possible collapse of the stack • adequate space should be provided within drum storage areas and drivers should be adequately trained to minimise forklift truck damage to the integrity of drums • accumulations of liquids in bunds, sumps, etc., should be dealt with promptly • such accumulations requiring removal should be analysed to ensure the correct disposal route, for example, pH, COD, heavy metals and other known contaminants from the spillage	Accident Management Plan ELL/022
IPPCS5.06, Section 2.9., Noise			
17 & 18	1	The Operator should employ basic good practice measures for the control of noise, including adequate maintenance of any parts of plant or equipment whose deterioration may give rise to increases in noise (for example, bearings, air handling plant, the building fabric, and specific noise attenuation kit associated with plant or machinery).	Noise Management Plan EMS, EM03-004
	2	The Operator should employ such other noise control techniques necessary to ensure that the noise from the installation does not give rise to reasonable cause for annoyance, in the view of the Regulator. In particular, the Operator should justify where Rating Levels (LAeq, T) from the installation exceed the numerical value of the Background Sound Level (LA90, T).	
	3	Further justification will be required should the resulting field rating level (LAR,TR) exceed 50 dB by day and a facade rating level exceed 45 dB by night, with day being defined as 07:00 to 23:00 and night 23:00 to 07:00.	
	4	In some circumstances “creeping background” (i.e. creeping ambient) may be an issue. Where this has been identified in pre-application discussions or in previous discussions with the local authority, the Operator should employ such noise control techniques as are considered appropriate to minimise problems to an acceptable level with the BAT criteria.	
	5	Noise surveys, measurements, investigations (e.g. on sound power levels of individual items of plant) or modelling may be necessary for either new or for existing installations, depending upon the potential for noise problems. Where appropriate, the Operator should have a noise management plan as part of its management system.	

WT BREF BAT Ref No.	IPPC S5.06 BAT Ref No.	BAT Requirement	Reference
IPPCS5.06, Section 2.10 Monitoring			
10, 12, 13, 14,18	1	Monitoring should generally be undertaken during all phases of operation (i.e. commissioning, start up, normal operation and shutting down) unless the Regulator agrees that it is inappropriate.	EMS / ISO 14001
	4	Where monitoring shows that substances are not emitted in significance quantities, it may be reasonable to reduce the monitoring frequency.	
		Monitoring and Reporting of Emissions	
10, 12, 13, 14,18	6	Where appropriate, periodic visual and olfactory assessment of releases should be undertaken to ensure that all final releases to air should be essentially colourless, free from persistent trailing mist or fume and free from droplets.	
		Monitoring and Reporting of Waste Emissions	
11	10	For waste emissions, the following should be monitored and recorded: • the physical and chemical composition of waste; • its hazard characteristics; and • handling precautions and substances with which it cannot be mixed.	
		Environmental Monitoring (beyond the Installation)	
10, 12, 13, 14,18	1	The Operator should consider the need for environmental monitoring to assess the effects of emissions to controlled water, groundwater, air or land, or emissions of noise or odour.	

WT BREF BAT Ref No.	IPPC S5.06 BAT Ref No.	BAT Requirement	Reference
IPPCS5.06, Section 2.10 Monitoring			
10, 12, 13, 14,18	3	The need should be considered for: • groundwater, where it should be designed to characterise both quality and flow and take into account short- and long-term variations in both. Monitoring will need to take place both up gradient and down-gradient of the site; • surface water, where consideration will be needed for sampling, analysis and reporting for upstream and downstream quality of the controlled water • air, including odour • land contamination, including vegetation, and agricultural products; and • assessment of health impacts; and • noise.	
	4	Where environmental monitoring is needed, the following should be considered in drawing up proposals: • determinands to be monitored, standard reference methods, sampling protocols • monitoring strategy, selection of monitoring points, optimisation of monitoring approach • determination of background levels contributed by other sources • uncertainty for the employed methodologies and the resultant overall uncertainty of measurement • quality assurance ("QA") and quality control ("QC") protocols, equipment calibration and maintenance, sample storage and chain of custody/audit trail • reporting procedures, data storage, interpretation and review of results, reporting format for the provision of information for the Regulation.	EMS / ISO 14001
		Monitoring of emissions to air	
	-	Otherwise daily visual monitoring to air for smoke, dust, litter, plumes and daily olfactory odour monitoring, with more extensive monitoring if nuisance is occurring or appears likely.	EMS
		Monitoring of Process Variables	ELL/017 Ell/018
-	1	Some process variables may affect the environment and these should be identified and monitored as appropriate.	

WT BREF BAT Ref No.	IPPC S5.06 BAT Ref No.	BAT Requirement	Reference
IPPCS5.06, Section 2.11., Closure			
1	2	Steps to be taken at the design-and-build stage of the activities Care should be taken at the design stage to minimise risks during decommissioning.	EMS ELL/005
	3	A site closure plan should be maintained to demonstrate that, in its current state, the installation can be decommissioned to avoid any pollution risk and return the site of operation to a satisfactory state. The plan should be kept updated as material changes occur. Common sense should be used in the level of detail, since the circumstances at closure will affect the final plans. However, even at an early stage, the closure plan should include: • either the removal or the flushing out of pipelines and vessels where appropriate and their complete emptying of any potentially harmful contents; • plans of all underground pipes and vessels; • the method and resource necessary for the clearing of lagoons; • the removal of asbestos or other potentially harmful materials unless agreed that it is reasonable to leave such liabilities to future owners; • methods of dismantling buildings and other structures, see Closure references which gives guidance on the protection of surface and groundwater at construction and demolition-sites; • testing of the soil to ascertain the degree of any pollution caused by the activities and the need for any remediation to return the site to a satisfactory state as defined by the initial site report	

WT BREF BAT Ref No.	IPPC S5.06 BAT Ref No.	BAT Requirement	Reference
IPPCS5.06, Section 4 Impact Assessment			
10, 12, 13, 14,18	*1*	Provide a description, including maps as appropriate, of the receiving environment to identify the receptors of pollution. The extent of the area may cover the local, national and international (for example, transboundary effects) environment as appropriate.	Environmental Risk Assessment Ell/012
	2	Identify important receptors, which may include: areas of human population including noise or odour-sensitive areas, flora and fauna (that is, Habitat Directive sites, special areas of conservation, Sites of Special Scientific Interest ("SSSI" or in Northern Ireland "ASSI") or other sensitive areas), soil, water, groundwater and watercourses (for example, ditches, streams, brooks, rivers), air, including the upper atmosphere, landscape, material assets and the cultural heritage.	
	3	Identify the pathways by which the receptors will be exposed (where not self-evident)	
	4	Carry out an assessment of the potential impact of the total emissions from the activities on these receptors.	
	5	In particular it will be necessary to demonstrate that an appropriate risk assessment of vent and chimney heights has been made to ensure that there is adequate dispersion of the minimised emission(s) to avoid exceeding local ground level pollution thresholds and limit national and transboundary pollution impacts, based on the most sensitive receptor, be it human health, soil or terrestrial ecosystems.	
	6	Where appropriate, the Operator should also recognise the chimney or vent as an emergency emission point and understand the likely behaviour.	
	7	Consider whether the responses to Sections 2 and 3 and this assessment adequately demonstrate that the necessary measures have been taken against pollution, in particular by the application of BAT, and that no significant pollution will be caused. Where there is uncertainty about this, the measures in Section 2 should be revisited as appropriate to make further improvements.	
	8	Where the same pollutants are being emitted by more than one permitted activity on the installation, the Operator should assess the impact both with and without the neighbouring emissions.	

WT BREF BAT Ref No.	BAT Requirement	Reference
2d	In order to improve the overall environmental performance of the plant, BAT is to use all of the techniques given below: Set up and implement an output quality management system – this technique involves setting up and implementing an output quality management system, so as to ensure that the output of the waste treatment in line with the expectations, using for example, existing EN standards. This management system also allows the performance of the waste treatment to be monitored and optimised and for this purpose may include a material flow analysis of relevant components throughout the waste treatment. The use of a material flow analysis is risk based considering, for example, the hazardous properties of the waste, the risks posed by the waste in terms of process safety, occupational safety and environmental impact, as well as the information provided by the previous waste holder(s).	Environmental Risk Assessment Ell/012
4	In order to reduce the environmental risk associated with the storage of waste, BAT is to use all of the techniques given below: a) optimised storage location – this includes techniques such as: the storage is located as far as technically and economically possible from e.g. sensitive receptors, watercourses, the storage is located in such a way so as to eliminate or minimise the unnecessary handling of wastes within the plant (e.g. the same wastes as handled twice or more or the transport distance on site are unnecessarily long); b) adequate storage capacity – measures are taken to avoid accumulation of waste, such as: the maximum waste storage capacity is clearly established and not exceeded taking into account the characteristics of the wastes (e.g. regarding the risk of fire) and treatment capacity; the quantity of waste stored is regularly monitored against the maximum allowed storage capacity and the maximum residence time of the waste is clearly established; c) safe storage operation – this includes measures such as: equipment used for loading, unloading and storage of waste is clearly documented and labelled; wastes known to be sensitive to heat, light, air, water, etc. are protected from such ambient conditions; and containers and drums are fit for purpose and stored securely. d) separate area for storage and handling of packaged hazardous waste – when relevant, a dedicated area is used for storage and handling of packaged hazardous waste.	Environmental Risk Assessment Ell/012

WT BREF BAT Ref No.	BAT Requirement	Reference
13	In order to prevent or, where that is not practicable, to reduce odour emissions, BAT is to use one or a combination of the techniques given below. a) Minimising residence time – minimising the residence time of potentially odour waste in storage or in handling systems (e.g. pipes, tanks, containers), in particular under anaerobic conditions. Where relevant, adequate provisions are made for the acceptance of seasonal peak volumes of waste; b) Using chemical treatment – using chemicals to destroy or to reduce the formation of odorous compounds (e.g. to oxidise or to precipitate hydrogen sulphide).	Odour Management
14	In order to prevent or, where that is not practicable, to reduce diffuse emissions to air, in particular dust, organic compounds and odour, BAT is to use an appropriate combination of techniques given below. a) minimising the number of potential diffuse emission sources – this includes technique such as: appropriate design of piping layout (e.g. minimising pipe run length, reducing the number of flanges and valves, using welded fittings and pipes), favouring the use of gravity transfer rather than using pumps, limiting the drop height of material, limiting traffic speed and using wind barriers; b) selection and use of high-integrity equipment – this includes techniques such as valves with double packing seals or equally efficient equipment, high-integrity gaskets (such as spiral wound ring joints) for critical applications, pumps/compressors/agitators fitted with mechanical seals instead of packing; magnetically driven pumps/agitators and appropriate service hoses' access ports, piercing piers, drill heads e.g. when degassing Waste Electrical and Electronic Equipment ("WEEE") containing VFCs and VHCs; c) corrosion protection – this includes techniques such as appropriate selection of construction materials and lining or coating of equipment and painting of pipes with corrosion inhibitors; d) containment, collection and treatment of diffuse emissions – this includes techniques such as storing, treating and handling waste and material that may generate diffuse emissions in enclosed buildings and/or enclosed equipment (e.g. conveyor belts), maintaining the enclosed equipment or buildings under an adequate pressure and collecting and directing emissions to an appropriate abatement system via an air extraction system and/or an air suction systems close to the emission sources; e) dampening – dampening potential sources of diffuse dust emissions (e.g. waste storage, traffic areas, and open handling processes) with water or fog;	Emissions Management Plan

WT BREF BAT Ref No.	BAT Requirement	Reference
14 (Cont.)	f) maintenance – this includes techniques such as ensuring access to potentially leaky equipment and regularly controlling protective equipment such as lamellar curtains and fast-action doors; g) cleaning of waste treatment and storage areas – this includes techniques such as regularly cleaning the whole waste treatment area (halls, traffic areas, storage areas, conveyor belts, equipment and containers; and h) leak detection and repair programme – when emissions of organic compounds are expected, a LDAR programme is set up and implemented using a risk-based approach, considering particular design of the plant and the amount and nature of the organic compounds concerned.	Emissions Management Plan)
23	In order to use energy efficiency, BAT is to use both of the techniques given below: a) energy efficiency plan; and b) energy balance record.	EMS / ISO14001
24	In order to reduce the quantity of waste sent for disposal, BAT is to maximise the reuse of packaging, as part of the residues management plan (see BAT 1).	

Mechanical Treatment of Waste

WT BREF BAT Ref No.	BAT Requirement	Reference
25	In order to reduce emissions to air of dust, and of particulate-bound metals, PCDD/F and dioxin like PCBs, BAT is to apply BAT 14d and to use one or a combination of the techniques given below: a) cyclone; b) fabric filter; c) wet scrubbing; and/or d) water injection into the shredder.	Emissions Management Plan

WT BREF BAT Ref No.	BAT Requirement	Reference
26	In order to improve the overall environmental performance, and to prevent emissions due to accidents and incidents, BAT is to use BAT 14g and all of the techniques given.	EMS/ section 4
28	In order to use energy efficiently, BAT is to keep the shredder feed stable.	Section

8 Appendix 1

Waste Pre-Acceptance Form

Waste Characterisation and Pre-Acceptance Form

The Waste Characterisation and Pre-Acceptance Form is required to ensure that the waste streams can be evaluated to determine if they are permissible in accordance with the site permit conditions [insert permit] and any other relevant procedures. Additionally, waste will only be permitted if its acceptance would not result in emissions to land, air and water, there are no signs of pests, vermin, odours, non-permitted waste types, etc.

Waste may only be permitted on site where a Consignment Note or Waste Transfer Note is present and the information detailed on the Consignment Note or Waste Transfer Note is correct.

The waste type & EWC Code MUST be listed in Table XXX of permit number XXXXXX

Waste Producer Details (Source Address, Origin etc.)										Collection Address (if different from producer)									
Telephone No.										Telephone No.									
Premises Code										SIC Code									
Pre-Acceptance Waste Material Information										Pre-Acceptance Ref Number:									
Nature of the process										Will the waste vary?									
Appearance (provide detail)	Smell									Colour						Consistency			
Physical Form (tick applicable)	Solid		Liquid							Sludge		Powder		Mixed		Gas			
MSDS Supplied	Yes		No							Analysis / Sample Required				Yes		No*			
Where was the sample taken from										Waste Container, Size and Amount									
Number of samples taken										Method									
*If a sample is not required, detail why	Visual inspection confirming description									Unused product as per MSDS									
	Unable to obtain representative sample									Other reason (detail)									
EWC Code(s):										Classification				Haz		Non-Haz			
Waste Description																			
Hazard Statement																			

Hazard Classification: (Please indicate hazards by ticking appropriate boxes below)

HP 1	HP 2	HP 3	HP 4	HP 5	HP 6	HP 7	HP 8	HP 9	HP 10	HP 11	HP 12	HP 13	HP 14	HP 15

Components present in the waste:
(tick YES or NO as appropriate, if yes provide component and concentration in the empty box below)

Component	Yes	No	Percentage	Component	Yes	No	Percentage
Acids				Persistent Organic Pollutants (POP)			
Alkalis				VOC - Halogenated			
Ammonia/Amines				VOC - Non Halogenated			
Toxic Gases on Acidification/Basification				List 1 and 2 Substances			
Metals/Metal Compounds				Pesticides/Biocides/Herbicides			
Oxidising/Reducing Agents				Human or Veterinary medicines			
Odorous Substances				Potentially infectious materials			
Non Edible Oils				Radioactive substances			
Phenols/Halogenated Phenols				Explosives/Pyrophorics			
Heterocyclic Compounds				Substances reacting with water			
Halogenated Compounds excluding VOC				Laboratory Chemicals			
Spontaneously combustibles				Other hazardous substances			
Sulphur Compounds				Cyanides			
Controlled Drugs POMs				Nitrates/Nitrites			
PCBs/PCTs							

I declare the above information is correct and I confirm I have fulfilled my duty to apply the waste hierarchy as required by Regulation 12 of the Waste (England and Wales) Regulations 2011.
I confirm that the information provided in this form is correct to the best of my knowledge.
I confirm that I am authorised by the above-named company to complete and / or provide any relevant supporting documentation.

Waste Producer Name:		Position:	
Signature:		Date:	

Waste Characterisation and Pre-Acceptance Form

Ellgia internal use only	
Disposal / Treatment Route	
Cost	
Transport & Operational Cost	
Quote Reference	
Caveats	

Form completed by Ellgia Representative			
Name:		Position:	
Signature:		Date:	

To be completed by a relevant company representative (COTC holder)					
Has the above information been reviewed against relevant permit conditions?			Yes		No
Is the waste type permissible under permit conditions?			Yes		No
Has the Customer / Waste Producer been informed if the waste is non-permitted?			Yes		No
Name:		Position:			
Signature:		Date:			

9 Appendix 2

Fines Sampling Plan

Ellgia Scunthorpe
Trommel Fines

Fines Sampling Plan

Version 1.1

Ellgia Ltd
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Site Contact:

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Date: December 2021

1 INTRODUCTION

This document outlines the sampling and analysis procedure undertaken by the Ellgia Scunthorpe in relation to the classification of trommel fines in accordance with The Waste Classification Technical Guidance WM3. The Structure of the sampling plan is based on BS EN 14899 2005.

2 OBJECTIVE

The objective of waste sampling and testing to obtain sufficient information on the nature, composition and properties of fines generated in wate processing and determine if it is a hazardous waste or non-hazardous. If the former then to assign hazardous properties, and to determine the correct List of Waste (LoW) code to be assigned.

This document details sampling requirements and testing standards.
Determination of the analysis will be carried out by independent accredited laboratory (SOCOTEC). The sampling and analysis procedures will be compliant with the relevant international standard documentation, further details are given in Appendix 2.

3 SAMPLING PROCEDURE

The sampling plan will be compliant with Technical Guidance WM3 Appendix D Waste Sampling.

3.1 Definitions

In this sampling plan the following terms have the meaning given below:

Sample:	The representative volume of fines (approx. 3-4kg) sent for laboratory analysis for each batch of fines produced, being made of an homogenized mixture of sample increments
Sample increment	The material collected from the stockpile during a single session (approximately 1 kg) which is combined with other sample increments to form the sample
Batch:	Approximately 1,000 tonnes of fines being made up of one or more stockpiles .

3.2 Site Safety

Safety on site is paramount to the successful operation of any sampling process and all personnel involved in sampling shall be adequately trained. Before commencing any work on site ensure ALL sampling personnel:

- Have completed a site safety induction and are aware of **ALL** site safety requirements.
- Wear the required appropriate PPE
- Have confirmed with the site supervisor that the sampling point is safe to access and the area in which they shall be working is free from moving machinery.

3.3 Fundamentals

3.3.1 Variability

The principle of any sampling procedure is to ensure that every particle in the lot or sub-lot to be represented by the sample should have an equal probability of being included in the sample. Appendix 1 includes the method statement for the sampling procedure to be use, based.

The sources of variability in the population of waste to be sampled must be understood and then exploited to ensure sampling is appropriately targeted. The different components in variability that may need to be addressed for trommel fines are:

a) **spatial variability**

This is variation within-stratum and between-stratum. This could be due to the mixing of a waste streams generated at differing locations or processes or simply from temporal variation within an individual process. Spatial variability may be reduced by mixing, or through segregation of individual streams.

To minimise the effect of spatial variability samples should be taken in accordance with the sampling pattern shown below and from a minimum depth of 200mm.

b) **temporal variability**

This is cyclic and random variability and variability which is driven by other time dependent factors). Processes can show some variation through time – due, for example, to changes in the nature of the input materials, changes in the process or operational efficiency in the plant or a combination or all three. Knowledge of the

causes of temporal variation is important as it has important bearing on the sampling programme. A preliminary sampling exercise may show that the day-to-day variation in stockpiles from a production process is much greater than the variation within a stockpile in any given day.

Regular inspection of trommel fines should be made at the exit from the trommel and in the stockpile to establish the extents of any visible temporal variability.

Laboratory samples should be made of on as many different increments as is practicable as opposed to focusing sampling effort on a single day.

3.4 Type of Sampling

As the ideal of any sampling exercise is to be able to extrapolate any data from a limited numberof samples to a much larger population, it is clearly important that any sampling exercise follows the probabilistic route whenever possible.

3.5 Sampling Point Location

Options for manual sampling point locations in order of preference are from:

a) a falling stream of material at a conveyor end or transfer point where the production material could be reached safely.

b) a stockpile of the processed material which can be accessed in accordance with the required sampling pattern.

Sus to the nature of the equipment in use on sit at Scunthorpe the sampling point shall be from stockpiles as b) above

3.6 Sampling Implement

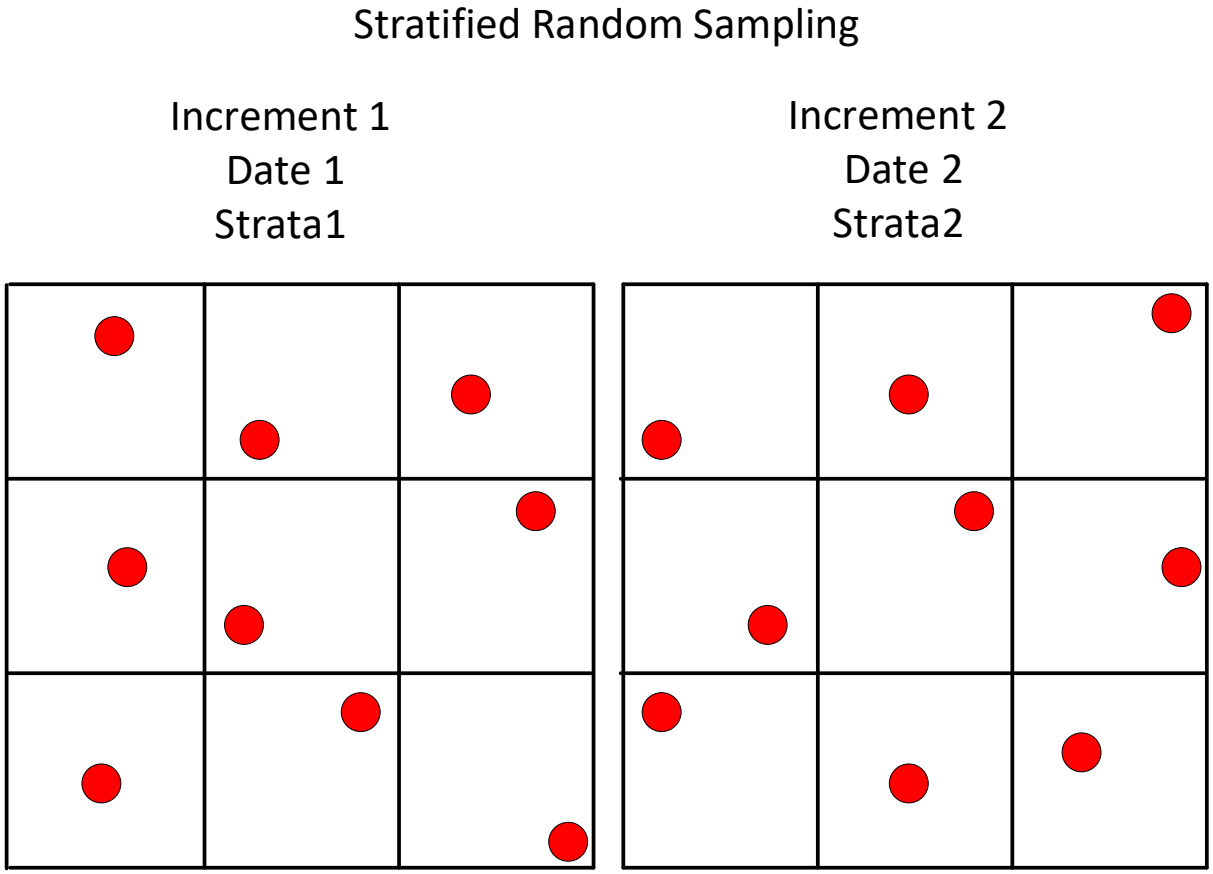
The sample increments shall be collected using a trowel and clean plastic bucket. The sample collection method statement is given in Appendix 1.

3.7 Sampling Pattern

The Collection of sample increments shall be based on stratified random sampling i.e., several increments from different strata are collected during the production batch of 1,000 tonnes. The specified number of scoops of material should be taken randomly within each stratum. The benefits of this approach are that each stratum within the batch is sampled, whilst the advantages of random sampling are retained within each stratum.

3.8 Sample Increments

A sample increment shall be collected approximately every 200 tonnes from the current used stockpile. The increment shall be made up of 9 scoops of material taken from a random position within an imaginary ninth part of the plan area of the stockpile.



Each scoop should be taken from at least a dept of 200mm below the surface.

Each sample increment shall be added to the previous increment in a suitably sized container and mixed thoroughly to create an homogenous mixture.

When 5 increments have been combined in this manner (i.e., after 1,000 tonnes) the sample containers shall be filled with the mixture and prepared for despatch to the laboratory for analysis. Any surplus material shall be returned to the stockpile.

3.9 Sample Size

The mass of sample required for each laboratory analysis is approximately 3-4kg. The laboratory sample shall consist of:

x 2 litre white plastic tubs
1x 60ml glass sample jar
1 x 120ml glass sample jar

The initial sample frequency shall be approximately every 1,000 tonnes

Increments shall be taken every 200 tonnes

4 Testing Procedures

4.1 Sample Containers

Sample containers will be suitably watertight to avoid moisture loss and robust enough that the sample integrity is preserved during sample transport.

4.2 Sample Labelling and Handling

Sample container(s) will be sealed after each use. Each container should be labelled with the following information:

- Site Name
- Sample Date
- Times of Increments
- Sampler Name

When the full sample is complete, a chain of custody (CoC) document will be completed with the sample reference/ID, site details and pre-populated analysis requirements. Upon collection, the CoC document will be signed by the Ellgia Scunthorpe site operative and the sample collection driver. Samples will be transferred to the SOCOTEC laboratory at Burton on Trent; upon arrival, they will be booked into the Laboratory Information Management System.

Appendix 1

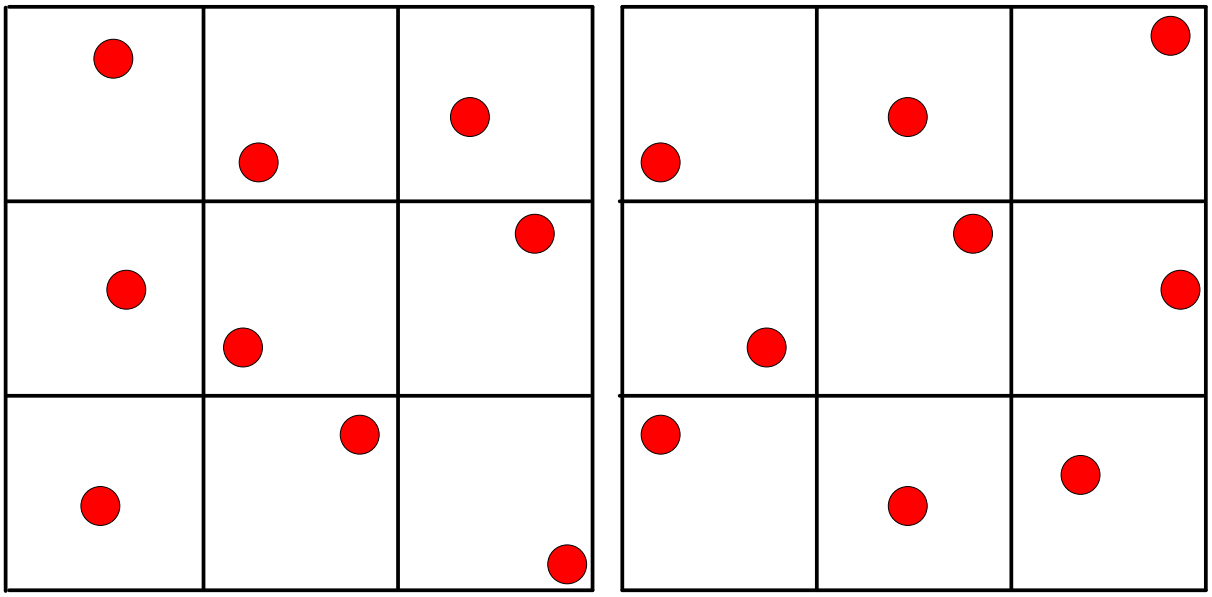
Sampling Increment Method Statement
Ellgia, Scunthorpe

- The sampling point shall be from the designated stockpile, currently being used to tip fines from the process.
- Confirm the stockpile is a safe to access and will be free of vehicle movements during the sample collection
- Confirm that the access route and product collection points are free from contamination.
- Check that collection bucket and scoop is clean and free of material
- Collect one scoop from nine locations as shown in the sample pattern diagram. (see overleaf)
- Each scoop should be taken from approximately 200mm below the surface
- Tip each scoop into the collection bucket and mix thoroughly
- When the increment is complete add the increment to the sample container and mix thoroughly with any previous increments
- Note the date and time of the sample and name of the sampler in the sample logbook.
- Following the collection of each increment the sample container shall be closed and sealed to preserve moisture and prevent contamination from external sources
- The above steps should be completed until the 5 increments have been taken.
- If the increment being added to the sample container is the final one (i.e., 5^{th} increment of 1,000 tonne batch) notify the supervisor that the sample is ready for despatch to the laboratory.
- The sample containers shall be labelled whilst sampling is in progress to ensure identification is present at all times. At completion of the processing period the sample containers shall be securely fastened, and a chain of custody record completed.

Stratified Random Sampling

Increment 1
Date 1
Strata1

Increment 2
Date 2
Strata2



Appendix 2

Waste Analysis and Classification Specification

Quote Description : Trommel Fines Testing 2021
Quote Number : BEC211123287 V1.1
Date of Issue : 17-Nov-2021
Quote Expiry Date: 17-Feb-2022
Contract Expiry Date: 17-Feb-2022

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Item Description	Price	Sample Quantity	Charge
Suite Name: Fines Suite			
Solids Preparation (Standard)			
9 Heavy Metals in Solids by ICPMS			
Arsenic in Solids by ICPMS			
Cadmium in Solids by ICPMS			
Copper in Solids by ICPMS			
Lead in Solids by ICPMS			
Mercury in Solids by ICPMS			
Nickel in Solids by ICPMS			
Selenium in Solids by ICPMS			
Chromium in Solids by ICPMS			
Zinc in Solids by ICPMS			
Chromium VI (Hexavalent)			
Sulphate as SO4 (Acid Soluble)			
16 PAHs by GCMS			
LOI: Loss on Ignition @ 440°C (Waste Fines)			
pH (2.5:1)			
Acid/Alkali Reserve			
GRO (C5-C10): Gasoline Range Organics			
TPH (>C8-C35) Banded plus (>C8-C40) Total with SCU			
Leachate Prep, Single Stage 10:1 (BSEN 12457-2)			
Total Sulphur as SO4 (Diss.) in Lab Leachate			
Asbestos Stage 1 (with Stage 2 Trigger)			
Suite Price:	£115.00	1	**£115.00**
Suite Name: Asbestos Stage 2 - Dependent			
Asbestos Stage 2: Quantification			
Suite Price:	£30.00	Rate Only	
Suite Name: Full WAC Single Stage			
Solids Preparation (DWC35)^			
WAC: Full Suite (Single Stage)^			
Suite Price:	£165.00	1	**£165.00**
Suite Name: Waste Report (per sample) NOR1001-116			
Waste Interpretation Report (M.Tsamaki)			
Suite Price:	£150.00	1	**£150.00**
Suite Name: Additional Costs			

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Item Description	Price	Sample Quantity	Charge
Suite Name: Additional Costs			
Courier Collection - Advance Booking	£20.00	1	£20.00
Courier Collection - Same Day Booking	£100.00	Rate Only	
Minimum Order Charge (Per Report)	£100.00	Rate Only	
Project Cancellation Charge	£50.00	Rate Only	
Report Amendment Charge (Per Reissue)	£20.00	Rate Only	
		Grand Total	**£450.00**

^ signifies results will be dry weight corrected.

Prices exclusive of VAT

To proceed with this quotation, please provide SOCOTEC UK Limited with written authorisation and your official purchase order, or complete and return the attached credit application form to open an account with SOCOTEC UK.
By accepting this quotation you are agreeing to the SOCOTEC UK Limited Terms and Conditions of Business and Service Agreement, attached.

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Notes Relating to your Quote

Courier Collections – Advance Booking:
A rate for a pre-arranged courier collection service for sample return to SOCOTEC Environmental Chemistry, Bretby has been included as an option. Our sample collection service is available Monday-Friday and applies to UK mainland addresses only. Samples are shipped overnight with the intention of arriving at the laboratory the next working day. Please note that our courier services are not guaranteed and SOCOTEC cannot accept any liability for resampling, site visit costs etc. due to delayed deliveries. Price applies on a per-collection basis.

Courier Collections – Same Day Collection:
A rate for a same day courier collection service for sample return to SOCOTEC Environmental Chemistry has been included . This charge will be applied to couriers requested on the same day as collection. Our sample collection service is available Monday-Friday and applies to UK mainland addresses only. Samples are shipped overnight and arrive at the laboratory for the next working day. Please note that our courier services are not guaranteed and SOCOTEC cannot accept any liability for resampling, site visit costs etc. due to delayed deliveries. Price applies on a per-collection basis.

Report Amendments:
Please note, any amendments required after a report is issued due to client omission, will incur an administration charge.

Minimum Order Charge:
A minimum order charge applies to analysis, per report for all orders . Miscellaneous costs such as couriers, disposal, enhanced turnaround charges etc. are in addition to the minimum order charge.

Asbestos Stage 1 (with Stage 2 Trigger): This asbestos testing option is for a Stage 1 (Screen and ID), however, analysis will automatically progress to a Stage 2 Quantification should sufficient asbestos material be detected during the screening process.

Waste Acceptance Criteria (WAC):
For each WAC sample the following containers are required to be filled : 1x1L plastic tub, 1x120ml and 1x60ml amber glass jars. Failure to provide sufficient material may result in the lab being unable to carry out the analysis . If additional testing is required alongside the WAC suite, more material may be required .
SOCOTEC recommends confirming with your proposed landfill or waste handler to ensure the analysis quoted is sufficient prior to submitting samples. Certain materials (oily, metallic or asbestos-containing waste) may require additional testing before being accepted.

This quote is based on a 10 working day turnaround due to the subcontracted analysis, an interim report can be provided for in-house methods after 7 working days if required

HMRC LOI analysis is subcontracted to SOCOTECEnergy Services, Bretby on a turnaround of 10 working days

Please allow an additional 5 working days from issue of analytical results for report to be completed.

Asbestos will automatically trigger, to stage 2, if this is identified in stage 1

Asbestos samples are subcontracted to IOM on a turnaround of 7 working days

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Analytical Technical Information

Fines Suite		MDL	Units	Accred.	Matrix	Holding Time
CLANDPREP	Total Moisture at 35°C	0.1	%	N	Solid	29 Days
CLANDPREP	Description of Solid Material		-	N	Solid	29 Days
ICPMSS	Arsenic as As	0.3	mg/kg	U	Solid	180 Days
ICPMSS	Cadmium as Cd	0.1	mg/kg	U	Solid	180 Days
ICPMSS	Copper as Cu	0.5	mg/kg	U	Solid	180 Days
ICPMSS	Lead as Pb	0.5	mg/kg	U	Solid	180 Days
ICPMSS	Mercury as Hg	0.1	mg/kg	U	Solid	180 Days
ICPMSS	Nickel as Ni	0.5	mg/kg	U	Solid	180 Days
ICPMSS	Selenium as Se	0.5	mg/kg	U	Solid	180 Days
ICPMSS	Total Chromium as Cr	0.5	mg/kg	U	Solid	180 Days
ICPMSS	Zinc as Zn	3	mg/kg	U	Solid	180 Days
KONENS	Chromium (VI) as Cr	0.1	mg/kg	N	Solid	
ICPACIDS	Acid Soluble Sulphate as SO4	20	mg/kg	U	Solid	180 Days
PAHMSUS	Acenaphthene	0.08	mg/kg	U	Solid	21 Days
PAHMSUS	Acenaphthylene	0.08	mg/kg	U	Solid	21 Days
PAHMSUS	Anthracene	0.08	mg/kg	U	Solid	21 Days
PAHMSUS	Benzo[a]anthracene	0.08	mg/kg	U	Solid	21 Days
PAHMSUS	Benzo[a]pyrene	0.08	mg/kg	U	Solid	21 Days
PAHMSUS	Benzo[b]fluoranthene	0.08	mg/kg	U	Solid	21 Days
PAHMSUS	Benzo[g,h,i]perylene	0.08	mg/kg	U	Solid	21 Days
PAHMSUS	Benzo[k]fluoranthene	0.08	mg/kg	U	Solid	21 Days
PAHMSUS	Chrysene	0.08	mg/kg	U	Solid	21 Days
PAHMSUS	Dibenzo[a,h]anthracene	0.08	mg/kg	U	Solid	21 Days
PAHMSUS	Fluoranthene	0.08	mg/kg	U	Solid	21 Days
PAHMSUS	Fluorene	0.08	mg/kg	U	Solid	21 Days
PAHMSUS	Indeno[1,2,3-cd]pyrene	0.08	mg/kg	U	Solid	21 Days
PAHMSUS	Naphthalene	0.08	mg/kg	U	Solid	21 Days
PAHMSUS	Phenanthrene	0.08	mg/kg	U	Solid	21 Days
PAHMSUS	Pyrene	0.08	mg/kg	U	Solid	21 Days
PAHMSUS	Total PAH 16	1.28	mg/kg	U	Solid	21 Days
SUB022	LOI @ 440°C (Waste Fines)	0	%	N	Solid	

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Fines Suite		MDL	Units	Accred.	Matrix	Holding Time
PHSOIL	pH (2.5:1 extraction)	1	pH units	U	Solid	14 Days
AAR	Alkali/Acid Reserve	0.1	g/100g NaOH	N	Solid	
GROHSA	Total GRO C5-C10	0.2	mg/kg	U	Solid	14 Days
TPHFIDUS (SCU)	>C10-C12 (SCU)	4	mg/kg	N	Solid	21 Days
TPHFIDUS (SCU)	>C12-C16 (SCU)	4	mg/kg	N	Solid	21 Days
TPHFIDUS (SCU)	>C16-C21 (SCU)	4	mg/kg	N	Solid	21 Days
TPHFIDUS (SCU)	>C21-C35 (SCU)	10	mg/kg	N	Solid	21 Days
TPHFIDUS (SCU)	>C8-C10 (SCU)	4	mg/kg	N	Solid	21 Days
TPHFIDUS (SCU)	Total TPH (SCU)	20	mg/kg	N	Solid	21 Days
TPHFIDUS (SCU)	Total TPH >C8-C40 (SCU)	20	mg/kg	N	Solid	21 Days
Leachate Preparation CEN 10:1	Equivalent Weight of Dry Material (kg)		kg	N	Solid	
Leachate Preparation CEN 10:1	Fraction above 4mm (%)		%	N	Solid	
Leachate Preparation CEN 10:1	Fraction of non-crushable material (%)		%	N	Solid	
Leachate Preparation CEN 10:1	Moisture content @ 105°C (% of Wet Wt)	0.1	%	N	Solid	
Leachate Preparation CEN 10:1	Volume of Water for 10:1 Leach (ltr)		l	N	Solid	
Leachate Preparation CEN 10:1	Weight of Sample Leached (kg)		kg	N	Solid	
ICPWATVAR (Dissolved)	Total Sulphur as SO4	3	mg/l	U	Lab Leachate	28 Days
SUB020	Asbestos Identification		-	N	Solid	

Asbestos Stage 2 - Dependent		MDL	Units	Accred.	Matrix	Holding Time
SUB020	Asbestos Stage 2	0.001	%	N	Solid	

Full WAC Single Stage		MDL	Units	Accred.	Matrix	Holding Time
CLANDPREP	Total Moisture at 35°C	0.1	%	N	Solid	29 Days
CLANDPREP	Description of Solid Material		-	N	Solid	29 Days
ICPMSW (Dissolved)	Antimony as Sb	0.01	mg/kg	N	Lab Leachate	28 Days
ICPMSW (Dissolved)	Arsenic as As	0.01	mg/kg	N	Lab Leachate	28 Days
ICPWATVAR (Dissolved)	Barium as Ba	0.1	mg/kg	N	Lab Leachate	28 Days
ICPMSW (Dissolved)	Cadmium as Cd	0.0002	mg/kg	N	Lab Leachate	28 Days
KONENS	Chloride as Cl	10	mg/kg	N	Lab Leachate	14 Days
ICPMSW (Dissolved)	Total Chromium as Cr	0.01	mg/kg	N	Lab Leachate	28 Days
ICPMSW (Dissolved)	Copper as Cu	0.01	mg/kg	N	Lab Leachate	28 Days
ICPMSW (Dissolved)	Lead as Pb	0.01	mg/kg	N	Lab Leachate	28 Days
ICPMSW (Dissolved)	Mercury as Hg	0.0003	mg/kg	N	Lab Leachate	28 Days

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Full WAC Single Stage		MDL	Units	Accred.	Matrix	Holding Time
ICPMSW (Dissolved)	Molybdenum as Mo	0.01	mg/kg	N	Lab Leachate	28 Days
ICPMSW (Dissolved)	Nickel as Ni	0.01	mg/kg	N	Lab Leachate	28 Days
SFAPI	Phenol Index	0.5	mg/kg	N	Lab Leachate	14 Days
ICPMSW (Dissolved)	Selenium as Se	0.01	mg/kg	N	Lab Leachate	28 Days
ICPWATVAR (Dissolved)	Total Sulphur as SO4	30	mg/kg	N	Lab Leachate	28 Days
PHCONDW	TDS as mg/kg	700	mg/kg	N	Lab Leachate	28 Days
WSLM13	Leached Organic Carbon	2	mg/kg	N	Lab Leachate	14 Days
ISEF	Fluoride as F	1	mg/kg	N	Lab Leachate	28 Days
ICPMSW (Dissolved)	Zinc as Zn	0.02	mg/kg	N	Lab Leachate	28 Days
PHCONDW	Conductivity at 25°C	100	µS/cm	U	Lab Leachate	28 Days
PHCONDW	pH	1	pH units	U	Lab Leachate	14 Days
PHCONDW	TDS as mg/l	70	mg/l	N	Lab Leachate	28 Days
ANC	ANC	0.04	mol/kg	N	Solid	
PHSOIL	pH (2.5:1 extraction)	1	pH units	M	Solid	14 Days
KONENS	Chloride as Cl	1	mg/l	U	Lab Leachate	14 Days
SFAPI	Phenol Index	0.05	mg/l	U	Lab Leachate	14 Days
ISEF	Fluoride as F	0.1	mg/l	U	Lab Leachate	28 Days
WSLM59	Total Organic Carbon	0.02	% m/m	U	Solid	28 Days
LOI(%MM)	LOI @ 450°C	0.2	% m/m	N	Solid	
WSLM13	Leached Organic Carbon	0.2	mg/l	U	Lab Leachate	14 Days
ICPMSW (Dissolved)	Antimony as Sb	0.001	mg/l	U	Lab Leachate	28 Days
ICPMSW (Dissolved)	Arsenic as As	0.001	mg/l	U	Lab Leachate	28 Days
ICPMSW (Dissolved)	Cadmium as Cd	0.00002	mg/l	U	Lab Leachate	28 Days
ICPMSW (Dissolved)	Total Chromium as Cr	0.001	mg/l	U	Lab Leachate	28 Days
ICPMSW (Dissolved)	Copper as Cu	0.001	mg/l	U	Lab Leachate	28 Days
ICPMSW (Dissolved)	Lead as Pb	0.001	mg/l	U	Lab Leachate	28 Days
ICPMSW (Dissolved)	Mercury as Hg	0.00003	mg/l	U	Lab Leachate	28 Days
ICPMSW (Dissolved)	Molybdenum as Mo	0.001	mg/l	U	Lab Leachate	28 Days
ICPMSW (Dissolved)	Nickel as Ni	0.001	mg/l	U	Lab Leachate	28 Days
ICPMSW (Dissolved)	Selenium as Se	0.001	mg/l	U	Lab Leachate	28 Days

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Full WAC Single Stage		MDL	Units	Accred.	Matrix	Holding Time
ICPMSW (Dissolved)	Zinc as Zn	0.002	mg/l	U	Lab Leachate	28 Days
ICPWATVAR (Dissolved)	Barium as Ba	0.01	mg/l	U	Lab Leachate	28 Days
ICPWATVAR (Dissolved)	Total Sulphur as SO4	3	mg/l	U	Lab Leachate	28 Days
BTEXHSA	Benzene	0.01	mg/kg	M	Solid	14 Days
BTEXHSA	Ethylbenzene	0.01	mg/kg	M	Solid	14 Days
BTEXHSA	m/p-Xylene	0.02	mg/kg	M	Solid	14 Days
BTEXHSA	o-Xylene	0.01	mg/kg	M	Solid	14 Days
BTEXHSA	Toluene	0.01	mg/kg	M	Solid	14 Days
BTEXHSA	Total BTEX	0.06	mg/kg	M	Solid	14 Days
PAHMSUS	Acenaphthene	0.08	mg/kg	M	Solid	21 Days
PAHMSUS	Acenaphthylene	0.08	mg/kg	U	Solid	21 Days
PAHMSUS	Anthracene	0.08	mg/kg	U	Solid	21 Days
PAHMSUS	Benzo[a]anthracene	0.08	mg/kg	M	Solid	21 Days
PAHMSUS	Benzo[a]pyrene	0.08	mg/kg	M	Solid	21 Days
PAHMSUS	Benzo[b]fluoranthene	0.08	mg/kg	M	Solid	21 Days
PAHMSUS	Benzo[g,h,i]perylene	0.08	mg/kg	M	Solid	21 Days
PAHMSUS	Benzo[k]fluoranthene	0.08	mg/kg	M	Solid	21 Days
PAHMSUS	Chrysene	0.08	mg/kg	M	Solid	21 Days
PAHMSUS	Coronene	0.08	mg/kg	N	Solid	21 Days
PAHMSUS	Dibenzo[a,h]anthracene	0.08	mg/kg	M	Solid	21 Days
PAHMSUS	Fluoranthene	0.08	mg/kg	M	Solid	21 Days
PAHMSUS	Fluorene	0.08	mg/kg	M	Solid	21 Days
PAHMSUS	Indeno[1,2,3-cd]pyrene	0.08	mg/kg	M	Solid	21 Days
PAHMSUS	Naphthalene	0.08	mg/kg	M	Solid	21 Days
PAHMSUS	Phenanthrene	0.08	mg/kg	M	Solid	21 Days
PAHMSUS	Pyrene	0.08	mg/kg	M	Solid	21 Days
PAHMSUS	Total PAH 16	1.28	mg/kg	U	Solid	21 Days
PAHMSUS	Total PAH 17	1.36	mg/kg	N	Solid	21 Days
PCBECD	PCB 101	0.005	mg/kg	M	Solid	28 Days
PCBECD	PCB 118	0.005	mg/kg	M	Solid	28 Days

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Full WAC Single Stage		MDL	Units	Accred.	Matrix	Holding Time
PCBECD	PCB 138	0.005	mg/kg	M	Solid	28 Days
PCBECD	PCB 153	0.005	mg/kg	M	Solid	28 Days
PCBECD	PCB 180	0.005	mg/kg	M	Solid	28 Days
PCBECD	PCB 28	0.005	mg/kg	M	Solid	28 Days
PCBECD	PCB 52	0.005	mg/kg	M	Solid	28 Days
PCBECD	Total PCB 7 Congeners	0.035	mg/kg	M	Solid	28 Days
TPHFIDUS (Aliphatic)	>C10-C40 (Aliphatic)	20	mg/kg	U	Solid	21 Days
TPHFIDUS (Aliphatic)	Total TPH >C8-C40 (Aliphatic)	20	mg/kg	M	Solid	21 Days
Leachate Preparation CEN 10:1	Equivalent Weight of Dry Material (kg)		kg	N	Solid	
Leachate Preparation CEN 10:1	Fraction above 4mm (%)		%	N	Solid	
Leachate Preparation CEN 10:1	Fraction of non-crushable material (%)		%	N	Solid	
Leachate Preparation CEN 10:1	Moisture content @ 105°C (% of Wet Wt)	0.1	%	N	Solid	
Leachate Preparation CEN 10:1	Volume of Water for 10:1 Leach (ltr)		l	N	Solid	
Leachate Preparation CEN 10:1	Weight of Sample Leached (kg)		kg	N	Solid	
WAC	WAC Report		-	N	Solid	

Waste Report (per sample) NOR1001-116		MDL	Units	Accred.	Matrix	Holding Time
SUB026	Waste Interpretation Report		-	N	Solid	

Key
MDL = Method Detection Limit
Accred. = Accreditation Status: M = MCERTS, U = UKAS, N = Not Accredited
SUB = Subcontracted Analysis

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SOCOTEC Environmental Chemistry General Notes

We recommend that samples are shipped to the laboratory and scheduled within 72 hours of completion of sampling. To avoid delays, any changes to your quote will need to be requested via the Quotes team and authorized prior to samples arriving at the laboratory. Samples submitted without schedules or a valid quote will be quarantined until the appropriate paperwork is provided.

Turnaround Times
If samples and/or schedules are received after 12:00 mid-day, the turnaround will commence from the following working day. Please notes tests that are subcontracted are subject to longer turnarounds and therefore the quotation and sample receipt will be the turnaround and date that the whole job is expected to complete. Interim reports for in-house analysis are available on request.

Non-Conforming Samples
Any samples found to be non-conforming will be quarantined and you will be informed. No work will be started and additional reject charges may apply.

Project Cancellation Charge
This charge will apply if a project, or set of analysis within a project is cancelled or changed after the samples have been booked into our laboratory. This is to cover the costs already incurred by sending sample containers, booking in the project and beginning preparation and extraction of samples for analysis.

Reporting Limits
The detection limits offered in this quotation are the lowest the laboratory is able to offer. Acceptance of this quotation confirms these limits are sufficient to cover your requirements. The laboratory makes the best endeavours to meet these detection limits, however, on occasions, interferences caused by the nature of the sample(s) may result in the laboratory reporting an elevated detection limit.

Accreditation
Soils, marine sediments, surface, ground and waste waters, landfill leachates plus liquids generated from soil leachate tests are covered by our UKAS accreditation. The laboratory may only claim that data is accredited when all requirements of our Quality System have been met. Where these requirements have not been met the laboratory may elect to include the data in its final report and remove the accreditation from individual data items if it believes that the reliability of the data has not been affected. The accreditation listed in this quote may not apply to your particular matrix. To confirm UKAS and MCERTs accreditation status please check testing schedule 1252.
https://www.ukas.com/wp-content/uploads/schedule_uploads/00002/1252Testing%20Multiple.pdf

MCERTs
If MCERTs reporting is required please notify us immediately, before authorizing the quote, so the correct preparation and testing can be included on the quote.

Deviating Sample Overview
Samples and their associated analysis schedules should be delivered to the laboratory within 72 hours of the completion of sampling. Any delay to delivery of samples to lab or the delivery of the associated schedules is likely to impact on sample deviancy. Deviating (or Non-Conforming) samples are defined by various factors such as those which are not preserved, exceeded their maximum holding time or handling time, are presented in inappropriate containers/packaging, have headspace present, been denatured through heat, light or humidity, have rotted or suffered microbiologically, have become cross contaminated, been damaged in transit or have been supplied in insufficient quantity. In addition, if the date and time of sampling and/or other relevant information is absent this may also produce deviating samples. Any of the above factors could jeopardize the validity of the reported test results. Where samples have been identified as non-conforming with respect to the laboratories deviant sample policy, the laboratory will continue with the scheduled analysis unless it receives a request to the contrary within 24 hours of the issue of the Sample Receipt Summary.

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Repeat Tests
Our UKAS acredited quality management protocols give us confidence in the validity of all test data provided; with quality controls including blanks, QC samples, reference materials, daily calibrations in place for all tests regardless of UKAS accreditation, as well as ongoing good performance in proficiency testing schemes. As such, should any data be called into question by our client, we are happy to double check all quality control measures in place surrounding this test data and report our findings. Should a repeat of any analysis be required by our clients following data checks, and the original results be validated by these repeat checks, a charge of £5.00 for inorganic tests and £10.00 for organic tests will be made to reflect the additional work involved. If repeat analysis generates a revised report with new data, this charge will not be applied. Analysis will be undertaken using air dried and ground soil wherever possible for inorganics to reduce the time taken to produce repeat data. The laboratory will advise on the level of reliability which can be attributed to repeat analysis based on the time elapsed since sampling took place and our handling and holding times.

Sample Containers (Within the UK)
For samples require Environmental Chemistry analysis, containers are provided to UK mainland addresses free of charge together with courier boxes, ice packs, chemical preservatives (where required) and Chain of Custody forms. Please Note: SOCOTEC reserves the right to charge for unused containers and/or courier boxes that are not returned to the laboratory.

Breakages During Transit
Whilst SOCOTEC UK Ltd does their utmost to ensure that bottles reach us in good condition, we are unable to accept responsibility for any additional site and resampling costs which may occur as a result of container breakages during transit.

Sample Storage and Data Retention
Samples are stored for 6 weeks from receipt. Samples can be stored for longer periods by request at an additional cost. Our policy for retention of electronic records and data stored through our LIMS system is 6 years.

Subcontracted Work
We reserve the right to subcontract work or change from the indicated subcontracted laboratory to another SOCOTEC UK Ltd approved subcontract laboratory for any commercial, operational or quality issue that may impact on the deliverability of analytical results. Items listed with a 'SUB' analysis code prefix will be carried out by an external subcontracted laboratory. The rates for subcontracted testing cannot be guaranteed for the duration of the contract. In the event our subcontractor(s) increase their rates, the contract will be amended and reissued to reflect the changes in cost. Information on subcontracted lab is available on request.

Purchase Order or Pre-Payment
Customers are requested to confirm their intention to proceed with the quoted work and have an account set up on the SOCOTEC UK Ltd system:

For customers with a SOCOTEC UK Ltd Credit Account:
Issue an official Purchase Order. If your company does not use purchase orders, a letter instructing SOCOTEC Environmental Chemistry to undertake the work will be required.
For customers with a SOCOTEC UK Ltd Cash Account:
Completed payment of a proforma invoice based on the estimated cost of the work.

SOCOTEC UK Ltd reserve the right to not commence work on any samples received without a valid quote and purchase order/paid proforma invoice in place.

Estimated Rates:
This estimate has been prepared based upon the sample numbers indicated on the bill of quantities provided. We reserve the right to renegotiate the proposed rates should final numbers of samples scheduled for analysis vary by more than 10% of those anticipated. Any changes to a contracted quotation (e.g. removal of tests from suites or additional testing to be added) must be requested via the estimating team prior to submitting samples to the lab. Failure to do so will result in delays.
All rates exclusive of VAT.

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10 Appendix 3

Example Fuel Sampling Plan

Ellgia Scunthorpe
SRF Production

Fuel Measurement & Sampling Plan

Supply Agreement 1 October 2021

Ellgia Ltd
Winterton Road
Scunthorpe
DN15 0DH

Site Contact:

Simon Roberts
Operations Manager
Tel number: 07918 735815
Email: simon.roberts@ellgia.co.uk
Date: September 2021

1 INTRODUCTION

This document outlines the sampling and analysis procedure undertaken by the Ellgia in relation to the supply of SRF from the Scunthorpe Facility to Andusia Ltd. The SRF Supply Agreement (the Agreement) dated 1 October 2021 is for a minimum of XXXXX tonnes per annum.

2 OFFTAKER REQUIREMENTS

Schedule 1 of the Agreement sets out the material specification. Ellgia shall be responsible for taking representative samples from each relevant Lot of SRF production and providing independent analysis of these samples.

This document details sampling requirements and testing standards. Determination of the analysis will be carried out by independent accredited laboratory (SOCOTEC). The sampling and analysis procedures will be compliant with the relevant international standard documentation, further details are listed below.

Analysis	Standard	Document Title
Sampling	BS EN 15442	Solid Recovered Fuels – Methods for sampling
Sample Preparation	BS EN 15443	Solid Recovered Fuels – Methods for laboratory sample preparation
Moisture	DD CEN/ 15414-1	Solid Recovered Fuels – Methods for the determination of moisture content using oven dry method
Particle Size	BS EN 15415	Solid Recovered Fuels – Methods for the determination of particle size distribution by screen method
Bulk Density	BS EN 15401	Solid Recovered Fuels – Methods for the determination of bulk density
Ash	BS EN 15403	Solid Recovered Fuels – Methods for the determination of ash content
Sulphur & Chlorine	BS EN 15407	Solid Recovered Fuels – Methods for the determination of Sulphur, Chlorine, Fluorine and Bromine
Gross and Net CV	BS EN 15400	Solid Recovered Fuels – Methods for the determination of calorific value
Carbon, Hydrogen & Nitrogen	BS EN 15408	Solid Recovered Fuels – Methods for the determination of Carbon, Hydrogen and Nitrogen content
Biomass Content	BS EN 15440	Solid Recovered Fuels – Methods for the determination of biomass content
Trace Elements	BS EN 15411	Solid Recovered Fuels – Methods for the determination of trace elements- As, Ba, Be, Cd, Co, Cr, Cu, Hg, Mo, Mn, Ni, Pb, Sb, Se, Tl, V, Zn

3 SAMPLING

The sampling plan will be compliant with BS EN 15442 Solid Recovered Fuels- Methods for sampling. This standard uses several data sets, such as particle size and bulk density to provide a set of principles which, if adhered to, produces a representative sample.

3.1 Site Safety

Safety on site is paramount to the successful operation of any sampling process and all personnel involved in sampling shall be adequately trained. Before commencing any work on site ensure ALL sampling personnel.

- Have completed a site safety induction and are aware of **ALL** site safety requirements.
- Have the required appropriate PPE and are wearing it as mandated by the local site stipulations.
- Have confirmed with the site supervisor that the sampling point is safe to access and the area in which they shall be working is free from moving machinery.

3.2 Sampling Fundamentals

The principle of any sampling procedure is to ensure that every particle in the lot or sub-lot to be represented by the sample should have an equal probability of being included in the sample. Appendix 1 includes the method statement for the sampling procedure to be use, based on Annex G (G.4) of EN 15442.

3.3 Sampling Point Location

Options for manual sampling point locations in order of preference are from:

a) a stopped conveyor onto which has been diverted the production stream for a designated short period, nominally a few seconds. The sample would be removed from the stopped conveyor using the appropriate size sampling frame. Having removed the sample from the conveyor any material remaining would have to be returned to the production stream during the next sampling operation.

b) a falling stream of material at a conveyor end or transfer point where the production material could be reached safely.

c) a stockpile of the processed material.

Samples shall be collected from a falling stream as per ii) above. There is no further processing of material after the point at which material is sampled and so the sampled material will be representative of the SRF being supplied to Andusia.

3.4 Sampling Implement

The sample increments shall be collected using an appropriate sampling implement as specified in BS EN 15442:2011 Solid Recovered Fuels – Methods for Sampling, Annex C.

The method statement, detailed later in this document, states that the sampling tool shall be a loading shove. As the aperture exceeds the required dimension based on particle size this is a fully compliant sampling implement for this material.

3.6 Sample Size (Mass)

The sampling container shall have sufficient volume to retain an adequate mass of the product being sampled. This can be determined from BS EN 15442- Solid Recovered Fuels – Methods for Sampling, Annex D.

Based on a nominal particle top size of 50mm, the required sample mass is 0,8kg.

4 Lot Size and Sample Increments

4.1 Sample Increment Number

For a sample to be representative of the processed material from the agreed sample timeframe, several increments should be taken, to make up the final sample. An increment is a single action of the sampling tool. BS EN 15442 states that for Solid Recovered Fuel, a sample should be made up of a ***minimum*** **of 24 increments.**

Within the parameters of EN 15442, the maximum lot that a sample can represent is 1,500 tonnes.

Based on a supply of XXXXX tonnes per annum this equates to 6.7 lots per year. The minimum number of increments (individual samples extracted from the SRF product) is therefore 161 per year or every 62 tonnes.

On this basis sample increments **shall be taken at least daily.**

Samples made up of 24 individual increments shall be despatched to the independent accredited laboratory for analysis, following the approved chain of custody procedures

5 Testing Procedures

5.1 Sample Containers

Sample containers will be suitably watertight to avoid moisture loss and robust enough that the sample integrity is preserved during sample transport.

5.2 Sample Labelling and Handling

Sample container(s) will be sealed after each use. Each container should be labelled with the following information:

- Site Name
- Sample Date
- Times of Increments
- Sampler Name

When the full sample is complete, a chain of custody (CoC) document will be completed with the sample reference/ID, site details and pre-populated analysis requirements. Upon collection, the CoC document will be signed by the Ellgia Scunthorpe site operative and the sample collection driver. Samples will be transferred to the SOCOTEC Energy laboratory at Burton on Trent; upon arrival, they will be booked into the Laboratory Information Management System.

5.3 Sample Preparation

At the SOCOTEC laboratory, the samples will be processed and prepared as per BS EN 15443:

- Sample containers emptied and mixed to form a fortnightly composite sample
- Representative subsamples taken for:
    - Total Moisture
    - Bulk Density
- Particle Size Distribution
- Remaining sample processed through a slow speed shredder and particle size reduced to 30mm
- Representative sample division to reduce sample mass
- Reduced sample mass processed through a slow speed shredder and particle size reduced to 10mm
- Representative sample division to reduce sample mass
- Reduced sample mass processed through a pulverizing mill and particle size reduced to <1mm to produce the analysis sample

Appendix 1

SAMPLING METHOD STATEMENT – ELLGIA, SCUNTHORPE

1. The sampling point shall be from a falling stream of material at a conveyor end or transfer point, where the production material can be reached safely.

2. Confirm that the processing route and product collection point is free from contamination. The floor underneath the conveyor should be cleaned and free from contamination**.**

3. In order that the required no. of sample increments are collected at a uniform rate throughout the batch production period the feed rate through the plant shall be determined. This will allow the time interval to be calculated at which the sample increments are to be collected.

4. Check that the loading shovel bucket is clean and free of material.

5. Each increment shall be collected in such a way that the full width of the stream of product is representatively sampled, from the full flow of material; this may only take a few seconds.

6. Tip the contents of the loading shovel into the prepared, clean sampling area.

7. Use mix and quartering method to reduce the sample to the required minimum weight.

8. The material taken should then be transferred into the sample containers using a shovel, **ALL** of the selected material must be transferred to the sample containers.

9. Following the collection of each increment the container shall be closed and sealed to preserve moisture and prevent contamination from external sources.

10. The above steps should be completed until the 10 increments have been taken.

11. The sample containers shall be labelled whilst sampling is in progress to ensure identification is present at all times. At completion of the processing period the sample containers shall be securely fastened and a chain of custody record completed.

Appendix 2

EN 15442 - Determination of minimum sample size

Table D.2 shows the minimum sample size for fluff-type solid recovered fuels with a large distribution in the particle size for a series of standard measures. 1 000 kg/m^3 has been assumed for the density (particle density). A value of 0,05 has been used for the shape factor; the distribution factor of the particle size *g* has been set at 0,25. A value of 0,1 has been assumed for the factor p, as for the coefficient of variation cv.

Table D.2 — General table for the determination of the minimum sample size of fluff-type solid recovered fuels [a]

d_{95l} (mm)	Minimum sample size (kg)	Minimum sample size (l)					
		Bulk density kg/m^3					
		50	60	75	80	90	100
50	0,8	15	13	10	10	9	8
75	2,5	50	42	34	32	28	25
100	5,9	120	100	80	74	66	59
150	20	400	340	270	250	230	200
200	48	950	790	630	590	530	480
250	92	1 000	1 600	1 300	1 200	1 100	920
300	159	3 000	2 700	2 200	1 500	1 800	1 600

[a] Table D.2 can be used when determining the minimum sample size for fluff-type solid recovered fuels with a density (particle density) of 1 000 kg/m^3, a shape factor f of 0,05, a distribution factor *g* of 0,25, a factor p of 0,1 and a coefficient of variation cv of 0,1. If the properties of the material deviate markedly from the values used in this table, the minimum sample size shall be calculated.

11 Appendix 4

Process Line Mass Balance