REQUEST FOR AGENCY APPROVAL: INCINERATOR BOTTOM ASH (IBA) PROCESSING TRIAL

KNOCKHARLEY LANDFILL LTD.

SEPTEMBER 2016

FEHILY TIMONEY & COMPANY

REQUEST FOR AGENCY APPROVAL: INCINERATOR BOTTOM ASH (IBA) PROCESSING TRIAL

KNOCKHARLEY LANDFILL LTD.

User is Responsible for Checking the Revision Status of This Document

Rev. Nr.	Description of Changes	Prepared by:	Checked by:	Approved by:	Date:
2	Issue to Client	JON/MG	BG	BG	14.09.2016

Client: Knockharley Landfill Ltd.

Keywords: Knockharley, Trial, processing, IBA, Incinerator Bottom Ash

Abstract: The following document outlines a request by Knockharley Landfill Ltd. to conduct a full scale processing and recovery trial on Incinerator Bottom Ash

TABLE OF CONTENTS

PAGE

LIST OF FIGURES

PAGE

LIST OF TABLES

1. INTRODUCTION

Waste Licence No. W0146-02 is for the operation and development of a landfill at Knockharley, Co. Meath. The waste acceptance consists of waste for disposal and recovery. Total waste acceptance is 200,000 tonnes per annum. The Licensee is Knockharley Landfill Ltd.

This document is a request for agency approval to amend Technical Amendment B – Condition 5.16.4 and 5.16.5. to allow an incinerator bottom ash (IBA) processing and materials recovery trial at Knockharley Landfill. The IBA will be sourced from Dublin Waste to Energy Ltd.'s facility at Pigeon House Road, Poolbeg Peninsula, Dublin 4, Dublin (W0232-01).

Condition 5.16.4 states *that "A maximum of 4,000 tonnes of incinerator bottom ash shall be processed in the trial".* While Condition 5.16.5 states that *"The trial shall continue for a maximum of 8 weeks from its date of commencement, or up to 10 weeks if agreed by the Agency in the case of delays arising following commencement."*

Knockharley Landfill Ltd is seeking approval to process up to 30,000 tonnes of IBA during the trial over a period of up to 6 months.

This documents outlines the details of the proposed trial.

1.1. Dublin Waste to Energy

Dublin Waste to Energy Ltd. (W0232-01) are currently in the process of constructing a Waste to Energy plant in Poolbeg, Dublin. The facility licence allows for the operation of an incinerator to burn non-hazardous waste and to recover energy in the form of steam and electricity (incineration plant) for export to the national grid and for the transfer of heat to a municipal district heating scheme, when such a system is available. The facility will accept only residual non-hazardous waste (household, commercial and industrial) and licence allows up to 600,000 tonnes of waste per annum to be processed at the facility.

1.2. Incinerator Bottom Ash

IBA is the non-hazardous solid residue that remains after the incineration of municipal solid waste in a waste to energy plant. IBA consists mainly of non-combustible inert aggregates such as sand, stone, glass, porcelain and ceramics, in addition to some ferrous and non-ferrous metals. The nature of the materials makes it suitable for reuse as construction aggregate subject to appropriate consents.

IBA typically contains up to 8% recoverable ferrous metals and 1-2% recoverable non-ferrous metals (e.g. aluminium, copper, lead, zinc) which if separated from the IBA can be recycled.

1.3. Proposed Trial

Knockharley Landfill Ltd request the approval of the Agency to conduct a processing trial at Knockharley Landfill for a period of up to 6 months to process and recovery materials from up to 30,000 tonnes of IBA. The IBA accepted for the trial will contribute to the total tonnage of waste accepted at the landfill.

The details of this trial are outlined in the following sections. The propose processing equipment to be used in the trial is very similar to the equipment used in the mini trail that was conducted in Oct/Nov 2013.

2. INCINERATOR BOTTOM ASH TRIAL

The trial will be undertaken to assess the following:

- Optimum maturation period prior to metal recovery.
- Quantity (% w/w) of recoverable ferrous metals
- Quality of Recovered ferrous metals
- Quantity (% w/w) of recoverable non-ferrous metals
- Quality of recovered non-ferrous metals
- Assess recovery process optimisation
    - equipment utilised
    - throughput variance
    - equipment performance vs. specification
- Output materials grading trials
- An assessment of recovered IBA engineering properties

It is proposed given the scope of the study that the trial will take place for a period of up to 6 months processing up to 30,000 tonnes of IBA. A trial of this duration is necessary to study and optimise process operations to ensure maximum recovery and to economically cover the significant costs associated with the mobilisation of the specialised plant to site to conduct this trail.

2.1. Location of Trial

It is proposed to undertake the trial at Knockharley Landfill. The trial will take place within the confines of an engineered landfill cell. Mobile plant and equipment will be mobilised to site and set up within a dedicated trial area. The plant will operate during operational hours as defined by the landfill licence.

Mobile equipment will typically consist of the following items.

- Screeners
- Conveyors
- Ferrous Metal Recovery Equipment e.g. over band magnets
- Non-ferrous metal Recovery Equipment e.g. Eddy current separator
- Crusher

Equipment will be laid out in series or parallel within the trial area. Unprocessed IBA will be stockpiled in dedicated areas to allow maturation to take place before being fed into the plant via a 360 excavator or similar. The plant will then process the materials, processing will typically consist of a number of screening, resizing and metals recovery operations. The recovered materials will be collected individually in stockpiles or appropriate skips/containers. Stockpiles will be assessed continuously and materials sampling undertaken as necessary as per the devised trial programme.

2.3. Process Description

The proposed trial process is being developed in conjunction with process equipment suppliers taking into consideration the results of similar processes trials in the UK and elsewhere.

It will typically consist of, but not limited to, the following:

1. Sizing and selection of material (<200mm) to remove oversize
2. 1st Stage Ferrous Recovery Over Band Magnet
3. Triple Screen Deck Separator (0-6mm, 6-12mm, 12-45mm >45mm)
4. Non Ferrous recovery: Eddy Current separator (3 fractions)
5. 2nd Stage Ferrous Recovery (3 fractions)

The above process may be adjusted dependant on the different grades of materials being produced. Additional steps such as crushing or additional sizing maybe introduced to meet target grading specifications for typical engineering materials e.g. NRA Specification 6F2.

Figure 2.1: Typical Mobile Triple Screen

The trial period is expected to last approximately 24 to 26 weeks depending on the results, speed of processing achieved and turn around on plant reconfigurations as required. A sample programme is outline in the table over.

Table 2.1: Proposed trial programme

Draft Programme: IBA Processing Trials	
Weeks 0-4	• Set up Mobile IBA processing plant • Weigh and stockpile incoming Materials in 500/1000 tonnes piles • Maturation of stock piles
Weeks 0-4	Processing Set Up 1 • Maturation of stock piles • Process Stockpiles • Assess Materials Recovery
Weeks 4-8	Set Up 1 Optimisation and Assessment • Throughput Variation Testing • Quality Assessment
Weeks 8-10	Process Set Up 2 • Plant Reconfiguration (Screen decks and sizes, jaw width, feed return etc.) • Maturation of stock piles • Process Stockpiles • Assess Materials Recovery
Weeks 10-14	Set Up 2 Optimisation and Assessment • Maturation of stock piles • Throughput Variation Testing • Quality Assessment
Weeks 14-16	Process Set Up 3 • Maturation of stock piles • Plant Reconfiguration (Screen decks and sizes, jaw width, feed return etc.) • Process Stockpiles • Assess Materials Recovery
Weeks 16-20	Set Up 3 Optimisation and Assessment • Throughput Variation Testing • Quality Assessment
Weeks 20-22	Process Set Up 4 • Plant Reconfiguration (Screen decks and sizes, jaw width, feed return etc.) • Maturation of stock piles • Process Stockpiles • Assess Materials Recovery
Weeks 22-26	Set Up 4 Optimisation and Assessment • Throughput Variation Testing • Quality Assessment

The programme outlined above is required to ensure a rigorous assessment of materials recoverability is achieved.

It is currently proposed that recovered materials will be subject to a range of tests dependant on the final trial requirement the following testing is currently proposed.

2.5.1. Recovered Inert IBA

Recovered inert will be subject to materials testing to assess suitability as an engineering materials. Dependant on the equipment set up a number of different recovered aggregates may be possible they including:

- 10mm Drainage Materials
- 20mm Drainage Materials
- 40mm Drainage Materials
- 5mm recycled Fines/Grit
- NRA Type 6F2 & 6f3 Capping Materials

Materials may be subject to testing as appropriate against published NRA, BS or other standard specification to assess their engineering properties.

Figure 2.2: Recovered Drainage Materials IBA

Testing will be conducted by an approved and accredited laboratory. The purpose of the testing will be to define an appropriate equipment set up and specification to maximise the recovery of materials and assess their reuse potential.

2.5.2. Ferrous and Non Ferrous Metals

Ferrous and Non Ferrous metals may be subject to quality assessment by approved metal recovery operators to assess their economic value and suitability for recovery The purpose of the testing will be to defined the most appropriate equipment set up and specification to maximise the recovery of materials and maximise their recycling potential.

2.6. Recovery of Materials

2.6.1. Incinerator Bottom Ash: Aggregate

IBA aggregate will be recovered for engineering purposes with the landfill cells e.g. construction of haul roads, temporary cover (fines materials) and sub temporary capping regulation layer (fines materials).

2.6.2. Ferrous Metals

Recovered ferrous metals will be appropriately stored and transported off-site for processing at an approved appropriately licenced facility in line with the requirements of the site waste licence.

Figure 2.3: Typically Recovered Ferrous Metals IBA

2.6.3. Non-Ferrous Metals

Recovered non-ferrous metals will be appropriately stored and transported off-site for processing at an approved and appropriately licenced facility in line with the requirements of the site waste licence.

2.7. Emissions

During the previous mini trial that was conducted in Oct/Nov 2013, dust, PM_{10} and noise monitoring was conduction on the site accordance with Schedule D of the licence. The results of this monitoring was submitted to the Agency in the quarterly monitoring reports for dust, PM_{10} and noise for the reporting period October 2013 – December 2013. No exceedances were detected for any parameter monitored.

During the proposed trial dust, PM_{10} and noise emission will be monitored in accordance with Schedule D of the licence.

There will be no additional traffic movements associated with the acceptance of the IBA as the tonnage proposed for the trial will contribute to the total tonnage of waste accepted at the landfill. IBA will be delivered to the facility in covered articulated tipper trucks. This type of vehicle currently delivers waste to the facility.

No complaints were received relating to the IBA processing during the trial.

3. REQUEST FOR AGENCY APPROVAL

Based on the information provided, Knockharley Landfill Ltd ask for the Agency's approval to carry out this trial at Knockharley Landfill. Dublin Waste to Energy Licence Condition 7.5 (b) (W0232-01) states:

> *"The licensee shall identify opportunities for: the recovery/recycling of residues"*

We would ask that the agency allow this trial to go ahead to allow important research into the area of maximisation of the recovery of IBA. The results of the trial will be key in securing possible significant future investment in permanent IBA recovery infrastructure subject to appropriate planning and consents as required. The trial will also drive research in the suitability for IBA for reuse as aggregate subject to suitable consents and achievement of End of Waste status.

We believe this is necessary due to the imminent development of an additional 600,000 tpa incineration infrastructure and a possible IBA generation rate of approximately 180,000-200,000 tpa nationally.