SECTION 2.0

DESCRIPTION OF THE SITE AND PROPOSED DEVELOPMENT

For inspection purposes only.
Consent of copyright owner required for any other use.

EPA Export 26-07-2013:03:29:05

2.1 PROJECT DESCRIPTION

2.1.1 Development Proposal - Overview

The proposed development will be located at the existing Clean (Irl) Refuse & Recycling Ltd site with and area of c.3.0ha in the town land of Ballinagun West, Cree, Co. Care (See Attachment 2 Site Location Map C(IRL)WL-03 and Site Layout Plan C(IRL)WL-03 in Attachment 3). The site has operated as a waste transfer station by Clean (Irl) Refuse & Recycling Ltd since 1984. The proposed project, which will upgrade existing activities at the site and introduce new activities, is being developed by Clean (Irl) Refuse & Recycling Ltd. The development of the site will allow the facility to expand the business to include new waste processing methods and increase the current tonnes per annum from 21,000 tonnes to 64,600 tonnes.

The proposed infrastructure development will include:

- Biostabilisation tipping & curing building with installation of in-vessel tunnels
- Extension to existing processing buildings
- Relocation of glass bunkers
- Provision to End of Life Vehicle unit
- Relocation of existing diesel tank bunded storage area
- Wheelie bin/truck wash service area
- Wheel wash
- Biomass Recovery Plant
- Hardstanding skip storage area

For inspection purposes only.
Consent of copyright owner required for any other use.

The development of the site will permit the continuation of existing waste processes which includes:

- Dry recyclable processing
- Wet waste processing
- Baling of material
- Dropdown skip processing
- Timber shredding processing
- Construction and Demolition waste processing

EPA Export 26-07-2013:03:29:05

The introduction of new waste processes/activities which will include:

- Biostabilisation (in-vessel tunnels and an aerated curing system)
- Provision to End of Life Vehicle unit
- Wheelie bin/truck wash
- Wheel wash
- Biomass recovery (electricity production)
- Skip storage

All existing and proposed processes will be carried out at the existing location in Cree, Co. Clare. The area of the existing site (c2.6ha) will be expanded to the north to include an additional c.0.4ha of land which is owned by the Directors of Clean (Irl) Refuse & Recycling Ltd. However, no waste processing will be undertaken in this additional area to be included in the proposed boundary of the site. The proposed site will cover a total area of c3.0ha. Please see Attachment 3 for the Proposed Site Plan Layout (C(IRL)WL-01) indicating the existing boundary in blue and the proposed boundary in red. Drawing (C(IRL)WL-02) indicated the boundary for which a Waste Licence Application will be made.

For inspection purposes only.
Consent of copyright owner required for any other use.

2.2 EXISTING SITE DESCRIPTION

2.2.1 General Site Description

The site for the proposed development is located in the town land of Ballinagun West, approximately 1.4km southwest of Cree, Co. Clare (see Attachment 3 - Site Location and Aerial Photograph). The site occupies a total area of c. 3.0ha. Topographically, the land is generally flat with occasional rolling hills. The site itself is set on a slight ridge splitting the site from north to south however this is not visually obvious. The site is currently a mixture of hardstanding and hardcore at various areas across the site. The surrounding land is a mixture of one-off housing and fields, with hedgerow, chain & link fencing or low-rise stone walls defining land boundaries. Land use is primarily agricultural with the closest services and non-resident buildings located c.1.4km away in the small village of Cree. The site is immediately bounded by a field to the east and a perimeter fence of a dog run to the west. The site is located on a local and is approximately 5km from the closest beach on the west coast as shown in·Figure·2.1·below.

EPA Export 26-07-2013:03:29:05

Figure 2.1

Topography

Gradients do not vary greatly across the site (37m to 33m O.D.). A ridge at an elevation of c.35m runs across the central part of the site from east to west. The north of the site falls off from this ridge at c.35m to c.33m at the entrance to the facility. The southern part of site at the rear of the processing buildings rises on the west and south to 37m O.D. and gently fall to the south east area. Due to this topography, surface water run off from the site is split into two drainage systems north and south.

For inspection purposes only.
Consent of copyright owner required for any other use.

Landscape

The site is situated in a rural setting in west Clare where the immediate surrounding landscape is dominated by flat green fields intermingling with gently rolling hills. Plate 2.1 shows the site location set amongst the rural setting, The key characteristics of the general surrounding landscape includes undulating to rolling hills, of a medium-high elevation. Some drumlin-type landforms are present, but these do not dominate. The area around Cree and across to Kilmihill consists of complex moorland and farmland. Occasional flatter areas within these hills exist, such as the Cree River Valley. Settlement is scattered, with small farms and many accessed via narrow lanes off the roads. Hedgerows enclose fields generally in the lower and more settled area, with post and wire commonly enclosing plantation.

EPA Export 26-07-2013:03:29:05

Plate 2.1 View of landscape looking south

Hedgerows define land boundaries and there is little development as the population of the surrounding area is low and consistent with the rural setting, with the area characterised by one off housing and ribbon development along the nearby roadways. There are no mountain ranges in the area.

The recreational areas in the vicinity of the site are mainly beaches and small coastal villages, with White Strand beach which is the closest recreational area at approximately 5km from the site in Cree. The closest town with legally defined boundaries is Ennis located c. 38km from the site in Cree.

For inspection purposes only.
Consent of copyright owner required for any other use.

2.2.2 Existing Site Uses and Adjoining Lands

The existing site operates as a material recovery facility (MRF) and waste transfer station. Clean (Irl) Refuse & Recycling Ltd. commencing waste processing activities on this site in 1984, the site was a grazing field with no previous history other than agricultural, therefore falling into the definition of a 'Greenfield' site. The existing waste transfer station is located in a rural area on c.2.6 hectares of land and is permitted under Clare County Council Waste Permit 002/07/WPT/CL granted 25th June 2006. This permit is granted under Waste Management Acts 1996-2005 and the Waste Management (Permit) Regulations 1998 (see Attachment 8).

The facility annual tonnage intake is capped at 21,000 tonnes and at 5,000 tonnes for the annual disposal fraction i.e. landfill (Condition 1.4 Waste Permit 002/07/WPT/CL). Table 2.2.1 shows the tonnages of waste accepted and processed at the facility.

EPA Export 26-07-2013:03:29:05

Table 2.1 Clean (Irl) Refuse & Recycling Ltd. Tonnages 2005-2007			
Year	**Tonnes Accepted**	**Tonnes for Recovery/Recycling**	**Tonnes for Disposal**
2005	16412	12737	3675
2006	18451	13087	4642
2007	21382	15445	4911

The facility currently operates from 7.30a.m. to approximately 7.30p.m. Monday to Friday and 7.30 a.m. to 1p.m. on Saturday, depending on business demand. These operational hours will be altered under a new waste licence. The company operates a waste collection service from domestic and commercial customers under waste collection permits for Co. Clare, Co. Limerick, Limerick City and Co. Kerry; all of the waste collected is processed at the site in Ballinagun West, Cree, Co. Clare.

The total number of permanent employees is currently 35. This figure includes 5 employees (shift work, engineers etc.) which are not permanently on site over the duration of a business day. The remaining 30 employees are located in different areas as follows:

For inspection purposes only.
Consent of copyright owner required for any other use.

- 8 employees working in Administration Offices during hours of business,
- 2 employees at weighbridge office,
- 20 permanent employees working in waste processing area and surrounds.

In addition to the above, 12 employees provide administration support and customer services from the Clean (Irl) Refuse & Recycling Ltd. office located in Ennis town.

The facility operates a two bin system; Blue bins contain dry recyclables and Green bins contain residual waste (canteen waste that cannot be recycled). Customers place blue/green bins for waste collection on alternative weeks. Waste is assigned EWC codes on arrival at the weighbridge.

All waste collected proceeds to the processing sheds where it is sorted, processed and separated into various fractions. Figure 2.1 shows the distribution of waste types accepted by the existing waste transfer station. Figure 2.2 shows the breakdown of customer type. Presently, 46% of customers are domestic and 54% of customers are commercial.

EPA Export 26-07-2013:03:29:05

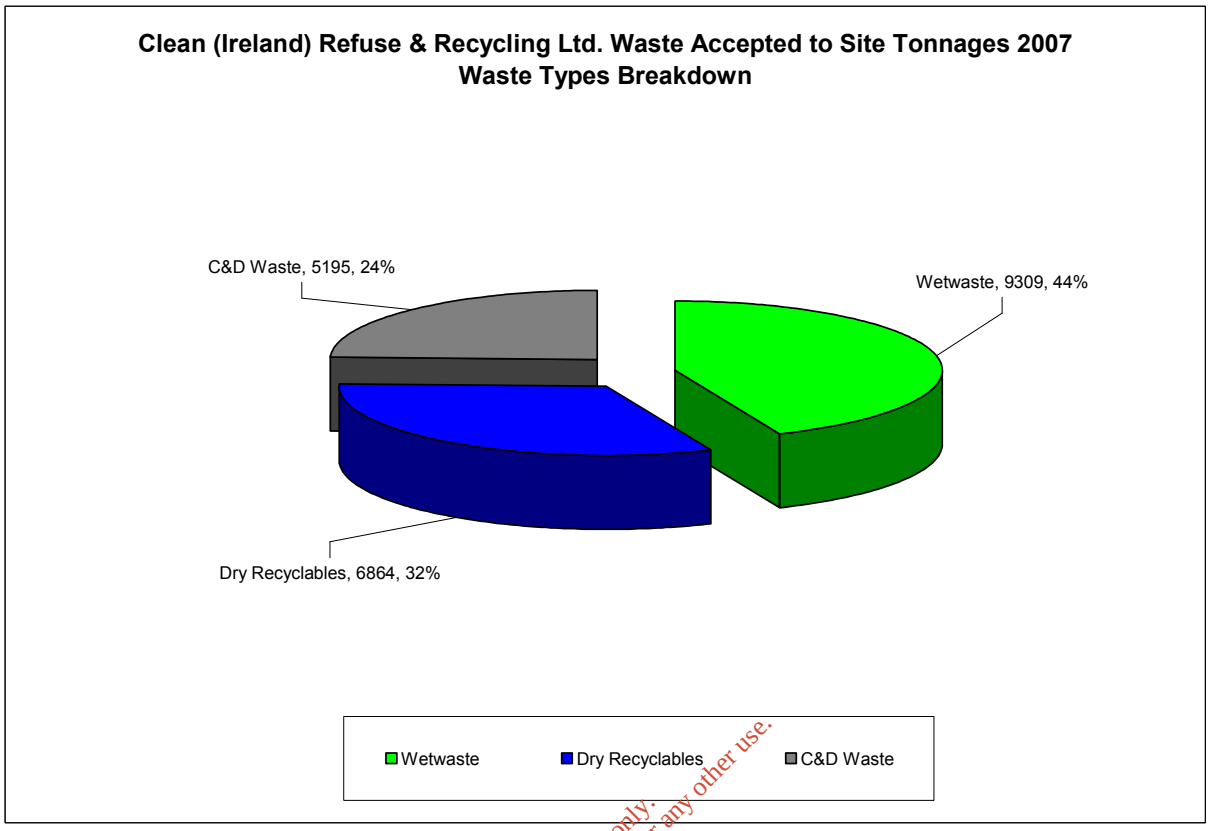


Figure 2.1 Waste Type Breakdown in 2007

Consent of copyright owner required for any other use.
For inspection purposes only.

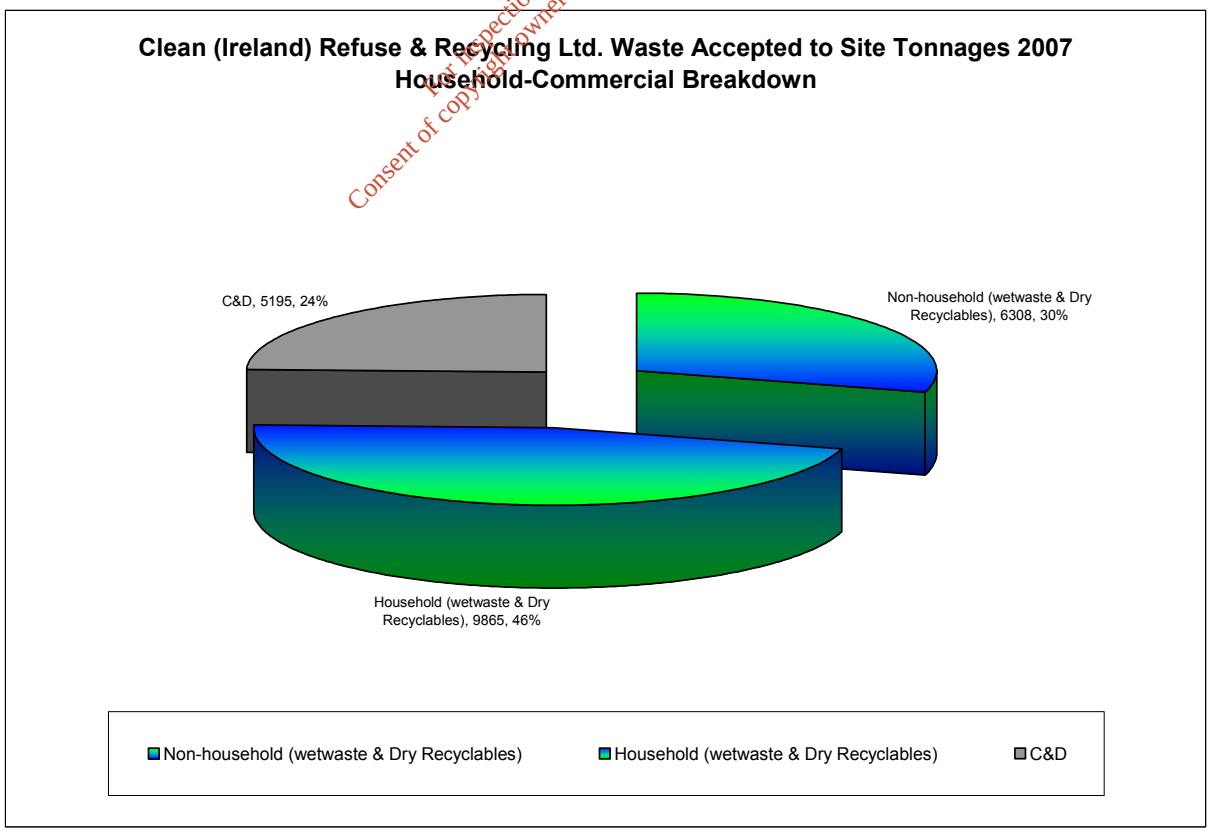


Figure 2.2 Household-Commercial Breakdown in 2007

EPA Export 26-07-2013:03:29:05

The existing Clean (Irl) Refuse & Recycling Ltd. facility consists of the following areas:

(1) Administrative offices
(2) Weighbridge & Office
(3) Employee services building including shower facilities
(4) Fuel Storage
(5) Woodchip Boiler Room
(6) Waste processing building
(7) Glass Bunkers
(8) ESB substation
(9) Designated smoking area
(10) Employee car park

2.2.2.1 Site Security

The north (front) of the facility is bounded by heavy metal gates with a half concrete/half metal fence on either site. The administrative offices, which has recently received planning permission (P08/P46 17th July 2008) for Material Change of Use (from dwelling to administrative offices) currently is a low rise building with an entrance and driveway. Under the planning conditions, this access will be closed off and be replaced with fencing similar to the existing security fencing.

For inspection purposes only.
Consent of copyright owner required for any other use.

The western boundary consists of 7ft high wire mesh fence from the road at the north of the facility to the most opposite north-westerly corner of the processing building. A 9ft high boundary earthen bank continues along the east of the site.

The southern boundary is in the form of earthen berms, which is landscaped with Common Alder and Scarlet Willow; post and wire fencing defines the boundary with adjoining lands.

The eastern boundary is a combination of post and wire fencing with natural hedgerows at the southern end. Adjacent to the processing buildings the boundary comprises earthen berms landscaped with trees combined with a support wall comprising of railway sleepers.

2.2.2.2 Fuel Storage

Currently, diesel fuel and oils are stored in a designated area on site. The tank/drums are stored within a fully reinforced concrete bunded area that conforms to the standard bunding specification (BS8007-1987) and is integrity tested. A paved area is provided around the storage tanks for fuel dispensing. Spill kits are in place at critical locations around the site. Typical volumes of hydrocarbons stored are:

EPA Export 26-07-2013:03:29:05

- Motor Diesel c. 3,000 litres
- Agricultural·Motor·Diesel·c.1,500litres
- Hydraulic Oil c.1,000 litres
- Engine Oil c,1,000 litres
- Waste Oil (barrel) c. 400 litres

2.2.2.3 Wheelie Bin/Truck/Wheel Washing

Clean (Irl) Refuse & Recycling Ltd. refuse and container trucks are washed as required in a designated area adjacent to the Fuel Storage Bund at the front of the site. A power hose is used to wash mud and dust off the vehicles. The washings drain into a concrete trap to retain any larger items (e.g. caught in wheels). This water drains into the surface water and is discharged to the north drain via a silt/oil interceptor. Wheelie bins washing currently takes place at a hardstanded designated area located at the eastern perimeter of the facility; washings are directed into the eastern surface water drain running parallel to the east perimeter in a northerly direction. There is currently no wheel wash facility at the site however, the proposed development will include a designated wheelie bin/truck wash with a leachate collection tank at the north of the site. On completion of the Biostabilisation Plant, all wheelie bin washing will take place in the tipping building, where washings can be recycled into the compostable waste..

Consent of copyright owner required for any other use. For inspection purposes only.

2.2.2.4 Processing Buildings

The large waste processing building is split internally into four working units. The building is a large steel portal framed building with concrete base walls of 1.5 metres above ground level to steel columns. The fabric of the wall cladding and roof sheeting is single skin profiled coated steel. The cladding is dark green in colour and similar to farming sheds observed in the surrounding areas. Plates 2.3 to 2.4 illustrate the structure of the existing processing sheds at Clean (Irl) Refuse & Recycling Ltd.

EPA Export 26-07-2013:03:29:05

Plate 2.2 Front of facility looking south

For inspection purposes only.
Consent of copyright owner required for any other use.

EPA Export 26-07-2013:03:29:05

Plate 2.3 View of west face looking east

For inspection purposes only.
Consent of copyright owner required for any other use.

Plate 2.4 View of east face looking west

EPA Export 26-07-2013:03:29:05

The main waste types processed at the facility include:

- Mixed residual waste (including compostable waste)
- Dry recyclables (including segregated recyclables)
- Construction and Demolition (C&D) Waste
- Timber waste

Each vehicle entering Clean (Ireland) Refuse & Recycling Ltd. site can enter only via the onsite weighbridge. The weight and type of each waste load is recorded at the weighbridge reception and assigned a unique consignment number. The waste processing building is segregated into two main sections, namely the wet shed and the dry recyclable shed.

The main existing waste activities on site include:

- Mechanical treatment of mixed recyclable waste
- Mechanical treatment of mixed residual waste
- Mechanical treatment of C&D waste
- Timber Shredding

For inspection purposes only.
Consent of copyright owner required for any other use.

These activities are carried out in areas within the processing buildings and the yard areas. The areas consist of:

- Dry recyclable processing area
- Wet waste processing area
- Baling of material area
- Dropdown skip processing area
- Timber shredding processing area
- Construction and Demolition waste processing area

Storage of waste on site is conducted according to the conditions set out in the existing Waste Permit 002/07/WPT/CL (Condition 4.11) where it is stipulated that temporary storage of all waste with a putrescible component shall not be stored on site for more than 72 hours. There is a limit of 3 months set for the temporary storage of dry recyclables.

All mixed residual waste (including compostable waste) and dry recyclables (including segregated recyclables) are stored in the designated processing buildings. C&D waste is stored adjacent to the trommel on hardcore at the rear of the west end of the processing building. Additional stockpiles may be temporarily stored at the southeast perimeter. Timber waste is stored at the rear of the east end of the processing building. Neither stockpile is currently

EPA Export 26-07-2013:03:29:05

covered or ring fenced. Glass is stored in three glass bunkers at the rear of the site in front of the bin storage area and is roofed to prevent contact between the waste glass and rain during rainfall events.

The facility processes non-hazardous waste only. All waste arriving at the site is subject to a visual inspection. Any waste deemed unsuitable for processing at the facility is immediately separated and directed to the quarantine area. The waste is stored under appropriate conditions to prevent odour generation, or the attraction of vermin. Occasionally hazardous waste may be included in skips (e.g. lead batteries, WEEE, fluorescent tubes) and these are transferred for further processing or disposal to approved waste brokers under their assigned European Waste Catalogue (EWC) codes.

Several processes on site are carried out at the facility which use both mechanically and manually means to sort the waste. Picking line areas consist of a conveyor belt through which the waste stream will pass at a speed that will allow the employees to remove recyclable material.

Technology and equipment associated with, but not limited to, the waste processing include:

- Feed conveyor to transport waste at variable speeds through the various treatment processes,
- Ballistic separator to separate dry recyclable material such as plastics, pams (paper and magazines), cardboard and Tetrapaks into different units,
- Magnets to extract all ferrous items from the waste stream,
- Eddy currents to extract all non-ferrous metal items out of the waste stream,
- Balers to create compact units of a pre-determined size,
- Compactors squash and contain waste for disposal off-site,
- Trommel rotates C&D waste to remove fines,
- Timber shredder shreds wood for reuse.

For inspection purposes only.
Consent of copyright owner required for any other use.

EPA Export 26-07-2013:03:29:05

A full list of equipment used on the Clean (Irl) Refuse & Recycling Ltd. site at Cree is included in Attachment 5.

2.2.2.4.1 Dry Recyclable Processing

Waste is tipped on the hardstanded floor of the building and inspected for any non-conforming waste (as per Waste Permit), which would be removed and transported to the quarantine area. Once the waste has been accepted, the waste is loaded into a bunker which feeds into a ballistic separator. The speed at which the waste is transferred into the ballistic separator segregates the material into three differing fractions namely:

- **Flat fraction**
- **Rolling fraction**
- **Fines fraction**

Material from the *flat fraction* consists of paper cardboard, plastic, aluminium and steel. The flat fraction is moved, via conveyor belt, to a picking line, where cardboard, plastic film and mixed waste are removed. Steel (ferrous) is removed mechanically by a magnet and an eddy current removes any aluminium (non-ferrous) cans. The remaining material is primarily paper, which is transferred to the on-site baler. Each material from the flat fraction is baled separately.

For inspection purposes only. Consent of copyright owner required for any other use.

Material from the *rolling fraction* consists of mainly plastic bottles, aluminium cans, steel cans and paper. The rolling fraction is fed onto the picking line where the waste is further processed as per the flat fraction. In this instance however, the residual material, namely the plastic bottles are fed to the baler separately.

The *fines fraction* which consists of undersized material such as bottle tops etc. fall through the separator and are baled with the plastic bottles.

A process flow for dry recyclables is included in Attachment 4.

Glass is accepted by the site from civic amenities and stored in covered bunkers. The glass is transported in bulk to contractors for recycling.

2.2.2.4.2 Wet Waste Processing

Mixed municipal waste is transferred to the wet shed for processing. As per the dry recyclables, the waste is weighed and then tipped to the wet shed for inspection. Inspection is necessary to remove any non-conforming waste. The contamination, if any, is either removed manually or using plant. The waste is then loaded into a bag opener, where the waste is fed, via a conveyor, to a magnet which removes the steel fraction. The remaining material is

EPA Export 26-07-2013:03:29:05

passed through a screen to remove fines, with the residual waste being sent directly to a baler or compactor. These organic fines are recovered for composting off site. Each baler is further wrapped for ease of transportation for disposal at landfill. A process flow for wet waste is included in Attachment 4.

2.2.2.4.3 Dropdown Skip Processing

The skip truck is weighed and directed to the appropriate shed. The material that has been emptied is inspected before further processing may continue. Once the material has passed the inspection it is then separated and segregated into the following fractions; steel, timber, plastic, other packaging and mixed waste. Each material is stored in a designated area, for further transfer or bailing. A process flow for skip processing is included in Attachment 4.

2.2.2.4.4 Timber Shredding

All wood waste received and identified for recycling, regardless of its final destination has to be broken down to smaller particles. The timber shredding process is carried out at intermittent times during the daily operations and is not a constant process. The three-stage process includes shredding, screening and metal extraction to produce a high quality woodchip, which meets the exacting standards demanded by customers. The first step in the process is to remove any contamination that would be included with the timber. This involves manually sorting through material and the removal of inappropriate material. Following this, the process the timber is fed into an infeed hopper using a Komatsu rubber duck. The in-feed hopper directs material into a cutting chamber, which consists of slow moving rotor cutting blades which grind the material to a wood chip consistency.

For inspection purposes only.
Consent of copyright owner required for any other use.

The timber screening process involves a heavy duty "sizing device" which is mounted below the cutting chamber and allows shredded material to pass through it is below a certain dimension. Oversized material is re-circulated back to the cutting chamber for further processing.

Following this, the wood chip material, then moves onto a moving conveyor belt. A magnet supported over the conveyor removes ferrous contaminants such as nails and hinges from the wood chip. The discharge conveyor directs processed material falling out of the cutting chamber into containers. Presently, the woodchip is transported onward for use as animal bedding. A process flow for Timber Shredding is included in Attachment 4.

2.2.2.4.5 Construction and Demolition Waste Processing

C&D waste is transferred using the Komatsu rubber duck to an infeed conveyor belt into a trommel. The C&D waste enters the trommel, which is rotating at a set speed which causes C&D fine material to 'drop out' to an area below at ground level. The bulk of the waste is transferred further along the conveyor belt into a pickling line station at a height equivalent to

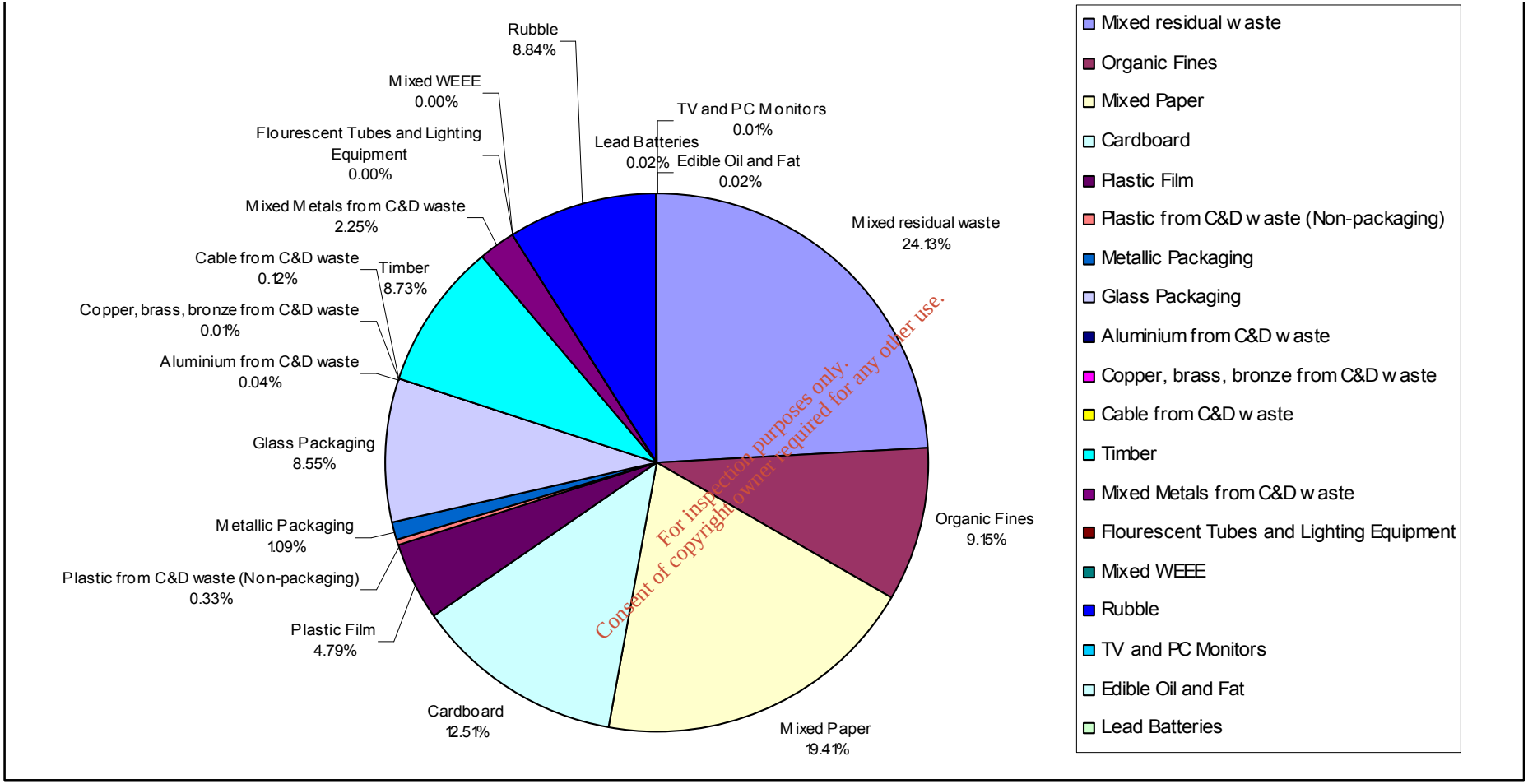
EPA Export 26-07-2013:03:29:05

the trommel. As the C&D waste passes through the picking line, metals, plastics and other materials are removed to designated skips for the segregated waste underneath the picking line station. The final C&D waste is C&D rubble that cannot be further processed and is removed off site for recovery. Currently, the fines are recovered as landfill capping as Ballyduff Beg landfill facility, Co. Clare. A process flow for C&D waste processing is included in Attachment 4.

Following the processing of waste accepted to the Clean (Ireland) Refuse & Recycling Ltd. facility, several segregated waste streams are created and transported off site for further processing, recycling or disposal. Figure 2.3 shows the breakdown of waste types removed from site in 2007.

For inspection purposes only.
Consent of copyright owner required for any other use.

EPA Export 26-07-2013:03:29:06



For inspection purposes only.
Consent of copyright owner required for any other use.

Figure 2.3 Breakdown of Waste Types Removed from the Facility in 2007

EPA Export 26-07-2013:03:29:06

2.2.3 Existing Site Layout

Hydrology

The site is situated south of the River Cree. The River Cree is classified as Q3-4 Moderate Status in the most recent water quality survey by the Environmental Protection Agency. The closest surface water body to the site is a drainage ditch which flows into a tributary stream of the River Cree flowing south of the site. This stream flows in a northerly direction into the River Cree, which is located approximately 750 m to the north of the facility. A drainage ditch at the north of the site drains across field drains and ultimately into the River Cree. The River Cree then flows into the sea at Rinnagonnaght Strand at Doughmore Bay. There is no river located within or immediately adjacent to the site apart from the drainage ditch mentioned above. These two discharges to surface water from the site consists of uncontaminated surface water, which is discharged via a silt/oil interceptor. The Doonbeg river is located c. 4.2km south of the location of the site.

Soils & Geology

The study area is underlain by Gley Soils and Quaternary Glacial Tills. The Gley soils have development due to the low permeability characteristics of the glacial till. The quality of the soil is generally clean and is indicative of Irish Soils. The glacial till is known to be >1.9 m in thickness and is described as mottled brown clay with clasts (Namurian rocks). The permeability characteristics are poor. The bedrock geology underlying the site is identify as Namurian Sandstones which consist of siltstones and sandstones. Land cover in the surrounding areas is largely grassland, with small coniferous plantations, extensive marshy and raised bog areas, and limited patches of blanket bog on more elevated ground.

Consent of copyright owner required for any other use.
For inspection purposes only.

Hydrogeology

Groundwater recharge in the study area is through diffuse sources (ie. rainfall), with recharge estimated at c. 200 – 2500 mm/yr. There were no karst features identified in the area. According to the Geological Survey of Ireland (GSI), the aquifer classification is given as locally important bedrock aquifer which is generally moderately productive only in local zones. Groundwater quality beneath the site is generally clean and free from contamination. Groundwater is used at the facility and locally as a means of domestic water supply as there is no mains water servicing the area. It is assumed that houses have individual private wells or use the Drumehilly Group Water Scheme for domestic usage. Groundwater vulnerability is classified by the GSI as high to extreme. The site is covered by hardstanding areas which provide protection to the underlying groundwaters.

EPA Export 26-07-2013:03:29:06

Existing Services

The site is serviced by ESB with overhead powerlines and currently the building of an ESB substation is underway at the southeast of the site to provide an import capacity 420 KVA and reroute overhead power lines under ground. Site services are shown in Services Plan C(IRL)WL-12 in Attachment 3.

2.2.4 Site Access

Access to the site can be achieved via two possible county roadways (refer to Site Location Map C(IRL)WL-17 in Attachment 2). Clean (Irl) Refuse & Recycling Ltd. employee vehicles can access the main site and employee car park from a westerly or easterly direction. From the Cooraclare to Cree Road R483, the site is accessed via a local road c.800m west of this junction. Alternatively, access can be gained from the west on the local road that links with the Doonbeg Road R4844 (north) or Cooraclare on local road. These roads are also currently used by residential properties along the roadways. Access into the site is through one gated entrance at the north of the site. All waste vehicles associated with the Clean (Irl) Refuse & Recycling Ltd must only access the local road from the R483 and enter only via the weighbridge.

For inspection purposes only.
Consent of copyright owner required for any other use.

2.3 PROPOSED DEVELOPMENT

2.3.1 Site Overview

In terms of the existing area of the site, the only increase to the site area under the proposed development will be an increase in area of c.0.4ha at the north of the facility thereby extending the site to the north only. The existing processing buildings and site infrastructure (ballistic separators, balers, conveyor belts) will not be impacted by the introduction of the new processes and development of the site as they have the duty capacity for processing the increase in tonnages associated with wetwaste, timber, C&D and dry recyclables . The main change to the existing operations, is the relocation of wetwaste processing to the Biostabilisation Plant.

The most significant development of the site will be localised to the most southerly section of the site where it is proposed to build a biostabiliation plant/biofilter, and also a small plant for the gasification of non-hazardous biomass to generate electricity for the site with potential to feed into the national grid. Extensions to the existing processing buildings, relocation of the glass bunkers, installation of diesel storage bunded unit, and the creation of End of Life Vehicle unit will be secondary in terms of the scale of the development. The proposed hours of operation are detailed overleaf:

EPA Export 26-07-2013:03:29:06

Proposed hours of operation:

7a.m. to 10p.m. Monday to Friday
7a.m. to 2p.m. Saturday

Proposed hours of waste acceptance/handling:

8a.m. to 8p.m. Monday to Friday
8a.m. to 1p.m. Saturday

Proposed hours of any construction and development works at the facility and timeframes:

9a.m. to 6p.m. Monday to Friday
9a.m. to 1p.m. Saturday

2.3.2 Development Proposal

For inspection purposes only.
Consent of copyright owner required for any other use.

The proposed project, which will upgrade existing activities at the site, is being developed by Clean (Irl) Refuse & Recycling Ltd. and will include the following: The proposed infrastructure development will include:

- Biostabilisation tipping and curing building
- Extension to existing processing buildings
- Relocation of glass bunkers
- Provision to End of Life Vehicle unit
- Provision of fuel/oil bunded storage unit
- Wheelie bin/truck wash service area
- Wheel wash
- Wood Burner and energy recovery
- Hardstanding skip storage area

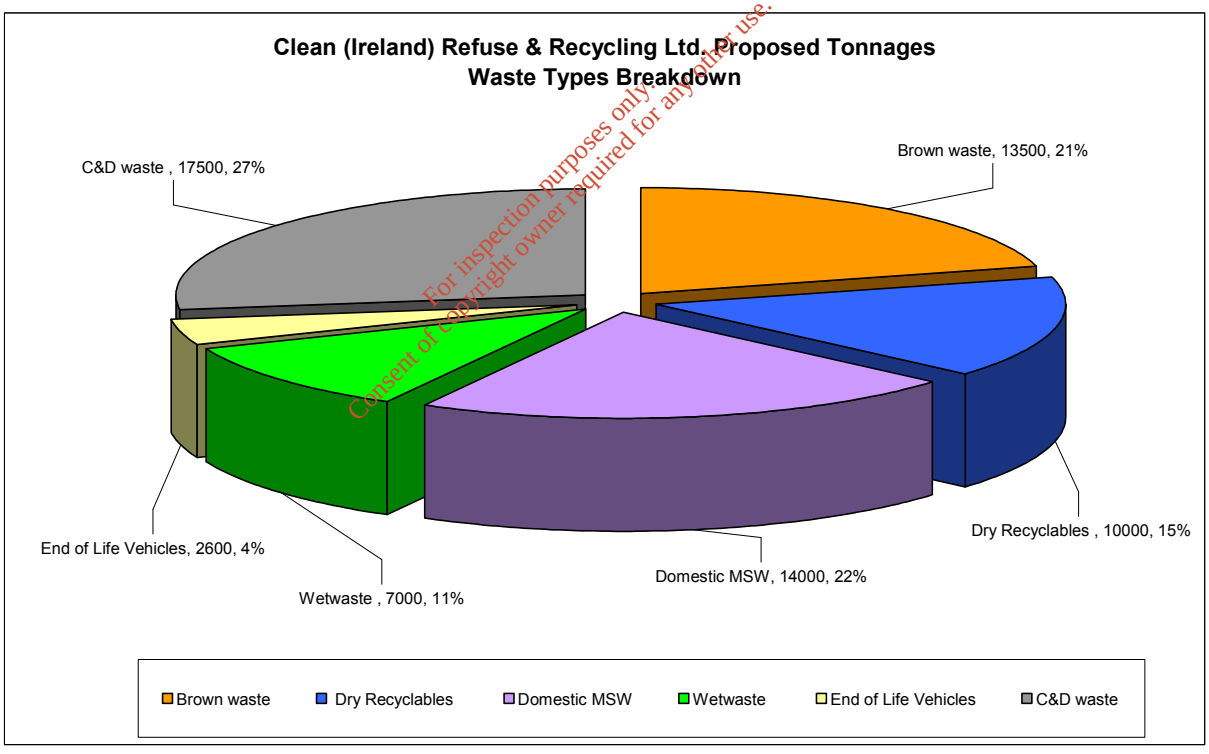
The introduction of new waste processes/activities which will include:

- Biostabilisation (in-vessel tunnels in an aerated curing system)
- Provision to End of Life Vehicle unit
- Wheelie bin/truck wash
- Wheel wash
- Biomass recovery (electricity production)

EPA Export 26-07-2013:03:29:06

- Skip storage

The project site will also include the existing processes and associated infrastructure which has been detailed in Section 2.2.2 Existing Site Uses and Adjoining Lands. It is proposed to increase the tonnages of waste processed at the facility to 64,600 tonnes per annum. Currently the facility is processing within capacity to the permitted capping t.p.a. of 21,000 tonnes. The facility, in its exiting state, has waste processing capacity to manage the increase in tonnes. It is anticipated that Clean (Ireland) Refuse and Recycling Ltd. will have the capacity to process waste for 30,000 customers when operating at full capacity with all waste treatment processes on-line. The waste types proposed include Brown Bin Waste (compostable), Dry Recyclables, Municipal Soild Waste (MSW), Construction and Demolition Waste (including timber waste), Wetwaste and End of Life Vehicles. Figure 2.4 illustrates the breakdown of waste types while Figure 2.5 shows the household-commercial breakdown. It is planned to ramp up the brown waste type on a phased basis from 10,000 to 15,000 tonnes in the first few years of operation.



For inspection purposes only. Consent of copyright owner required for any other use.

Figure 2.4 Proposed Waste Type Breakdown

EPA Export 26-07-2013:03:29:06

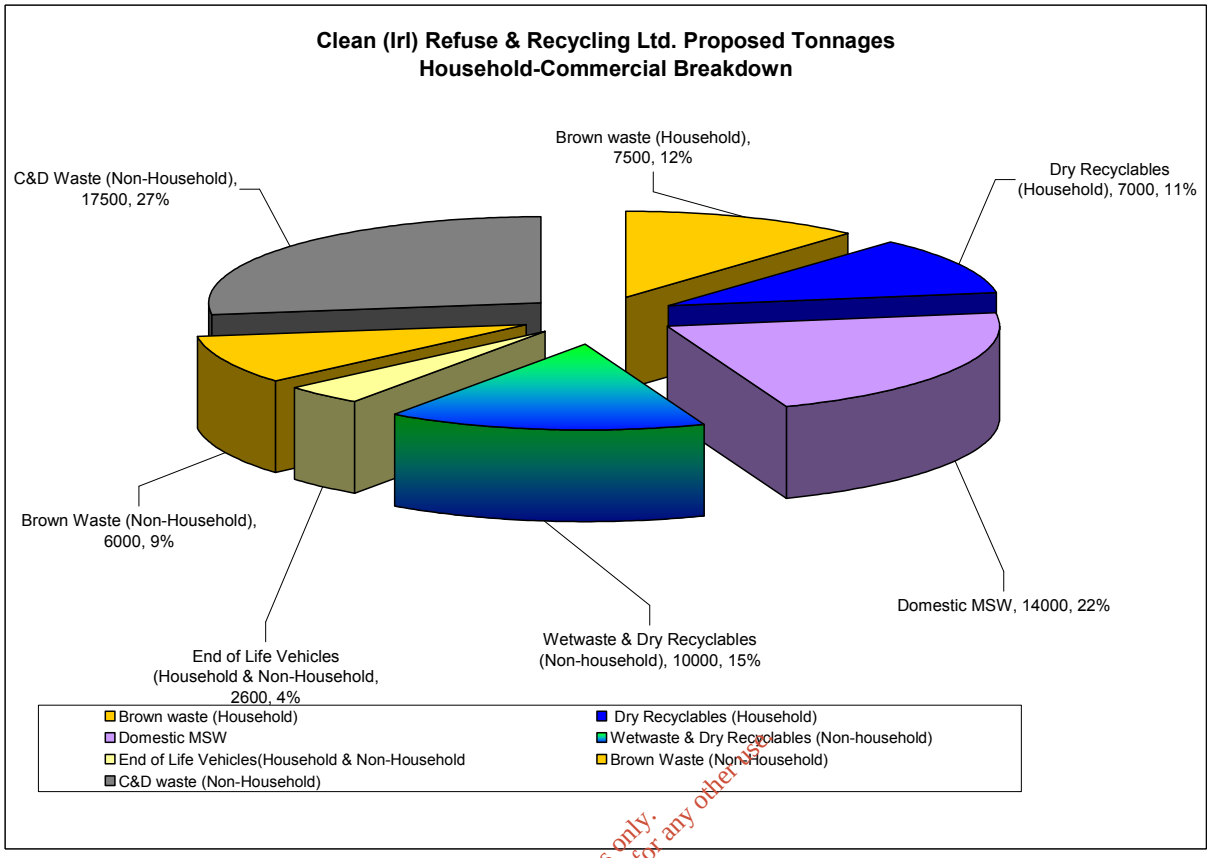


Figure 2.5 Propose Household-Commercial Breakdown

For inspection purposes only.
Consent of copyright owner required for any other use.

2.3.2.1 Bio stabilisation Plant

2.3.2.1.1 Construction and Design

Clean (Ireland) Refuse and Recycling Ltd. is proposing to build and operate a state-of-the-art, totally enclosed facility to convert up to 15,000 tonnes (when blended with bulking materials, mainly shredded timber) per year of biodegradable materials found in the residential and commercial waste streams into fully stable and marketable soil amendment products. The proposed tonnes for brown bin waste intake to the facility will be 13,500 tonnes. This facility will utilise proven, best available control technologies and best management practices for processing biodegradable waste materials, such as landscape materials, food, wood and non-recyclable paper, into valuable soil enhancing products while minimising any potential impacts to the environment or nuisances to neighbours. This proposed bio-stabilisation and pasteurisation treatment plant will be built in one phase and involves footprints of c.4140m^2 for the Biostabilisation Plant and 930m^2 for the associated biofilter.

EPA Export 26-07-2013:03:29:06

The facility will be built to process a total of 15,000 tonnes per year. The construction of the Bio-stabilisation plant will be located at the southern section of the site and it is envisaged that construction works will be carried out over a 6-9 month period. The tonnes of waste handled will be carried out over two phases, 1 and 2 as shown below.

Estimated Quantities of Materials to be Processed by the Biostabilisation Plant

Types of Materials	**Estimated Quantity Phase 1 in tonnes per year**	**Estimated Quantity Phase 2 in tonnes per year**
Drop-off Garden/Landscape Materials	500 - 1,000	1,000 - 1,500
Residential Brown Bin	2,500 - 3,000	3,000 - 5,000
Commercial Food	1,000-1,500	1,500 – 2,500
Biosolids or other sludges	1,000 – 2,000	2,000 – 3,000
Wood and other bulking materials	1,000 – 1,500	1,500 – 2,000
Mixed waste fines	2,000 – 3,000	1,000 – 2,000
Other biodegradable materials	1,000 – 2,000	1,000 – 3,000
Totals	Up to 10,000 tonnes per year	Up to 15,000 tonnes per year

For inspection purposes only.
Consent of copyright owner required for any other use.

The internal and external layout Drawing C(IRL)WL-27 of the Bio-stabilisation plant is included in Attachment 3. The plant will be in the form of two separate buildings (tipping and curing) with negative pressure and a ventilation system with four to six changes in air hourly or as required. The six aerated concrete tunnels will be located externally to the tipping and curing building. The building fabric of the plant will mainly comprise of concrete, with cladding to the eaves. Concrete push walls are required internally which will be constructed 2-3 metres high for handling of waste piles with plant machinery. Doors at each end will be erected for access to the concrete tunnels. In addition to the biostabilisation plant, infrastructure will included two odour removal and treatment systems: a wet scrubbing system and a biofilter.

The type of bio-stabilisation plant to be used can be categorised as a two-step composting process consisting of an in-vessel stage followed by an enclosed aerated static pile composting and curing stage. The plant components/equipment consists of the following items:

(i) Existing weighbridge
(ii) Existing high speed shredder for clean timber and woody landscape material

EPA Export 26-07-2013:03:29:06

(iii) Tipping building with seven tipping bays and corresponding feedstock storage bunkers
(iv) One front-end loader for dirty area (within tipping building)
(v) 1-2 feedstock mixers in tipping and receiving building
(vi) Tunnel System: 6 concrete tunnels with door on each end. Includes 2 high speed, high pressure blowers for each tunnel, aeration floors, piping and valves, and automated process control system
(vii) Aerated static pile curing system:12 aerated curing and aging bunkers, blowers, piping, valves and automated process control system
(viii) Curing and screening building with aeration bunkers, screening area and product storage bunkers
(ix) Front-end loader for clean area (within curing and screening building)
(x) Screen with air classifier.
(xi) Odour control system: wet scrubber and biofilter for tunnels, aerated static pile curing system, tipping building and curing building
(xii) Leachate/condensate collection system, tanks and pumps
(xiii) Office housing process control system

For inspection purposes only.
Consent of copyright owner required for any other use.

2.3.2.1.2 Air Extraction

All compost process exhaust air and all building ventilation air will be collected and treated, including air streams from the following activities and areas:

- Composting process air from in-vessel concrete composting tunnels
- Composting process air from aerated static piles within curing building
- Ventilation air from the tipping and receiving building
- Ventilation air from the curing building

Composting process air from tunnels and the curing piles will be combined with ventilation air from both the tipping and curing buildings and forced through an odour treatment system consisting of a wet scrubber and a biofilter. Ventilation blowers will be sized for 4-6 air changes an hour within the two buildings during the day and for 1-2 air changes an hour at night time. These ventilation blowers will draw air out of the buildings from a system of duct work within the building. This effectively creates a negative pressure within the building so that when doors are temporarily open, building air stays within the building instead of escaping outside.

Negative pressure within the curing building is achieved by drawing air from both the floor system at 0.055 bar and the building interior head space at 0.025 bar. The buildings will draw incoming air through the doorways when open and inlet louvers

EPA Export 26-07-2013:03:29:06

(if the doors are closed), and then discharges through the wet scrubber and biofilter. Based on the 2006 International Mechanical Code, an appropriate ventilation rate for the reception building during working hours is 4.5 air exchanges per hour and an appropriate ventilation rate for the curing building during working hours is 6.0 air exchanges per hour.

2.3.2.1.3 Odour control

There are two odour removal and treatment systems in this proposed design. The first is a wet scrubbing system and the second is the biofilter. Worked in combination, this odour treatment system is 95-99% efficient in removing all odorous compounds including ammonia, hydrogen sulphides, mercaptans, organic acids, aldehydes and amines. This two stage odour treatment process is now considered best available control technology for composting facilities. A single stage scrubber will be used to both humidify the airflow and remove most of the ammonia from the air stream. Ammonia removal is by transfer to the water loop in the scrubber system. The water loop will have a bleed (waste) rate to manage ammonia in the scrubber solution with the discharged water being reused in the composting process. This is important as too much ammonia within the air stream inhibits the microbes within the biofilter. After air passes through the wet scrubber, a single stage biofilter will be used to both remove left over ammonia and other odorous compounds. The media is specifically designed to be nitrogen starved, which will make residual ammonia removal from the airstream more efficient. As ammonia and other odorous compounds are captured by the biofilter, microbes living within the film of moisture surrounding biofilter media particles convert them to minerals, carbon dioxide and organic forms of nitrogen that gradually convert the woody media to humus (compost) over time.

Consent of copyright owner required for any other use. For inspection purposes only.

The wet scrubber collects four primary exhaust streams from the proposed facility, including:

(i) Tunnel exhaust (low volume, high temperature, high ammonia, high moisture)

(ii) ASP exhaust (moderate volume, moderate temperature, moderate ammonia, high moisture)

(iii) Ventilation air from the tipping building (high volume, low temperature, low ammonia, low moisture)

(iv) Ventilation air from the curing building (high volume, low temperature, low ammonia·and·moderate·moisture)

This means that air from the tipping and curing building are combined with the process air from the tunnels and ASP system and then sent through the combined wet

EPA Export 26-07-2013:03:29:06

scrubber and biofilter air treatment system. The treatment of these air streams within the scrubber will moderate the temperature and ammonia levels while maintaining a saturated air stream that will not dry out the biofilter. Consequently, the biofilter should receive a buffered air stream with low ammonia, high moisture and moderate temperature (40 – 45^{o} C) that result in optimum biofilter performance.

For inspection purposes only.
Consent of copyright owner required for any other use.

Plate 2.5 Typical scrubber configuration used to blend, humidify and scrub ammonia from the combined air streams.

A biofilter converts odours and VOCs into carbon dioxide, water, energy and organic matter. Polluted air passes through a custom blend of organic matter and mineral components called media. The airborne compounds impinge upon a film of water surrounding each particle of media (adsorption). Once the compounds are trapped in this film, they become the food source for the micro-organisms living on the wet surfaces of the particles. The digestive processes of the organisms break down the pollutants and odours into odourless by-products (decomposition). A biofilter's ecosystem is remarkably robust in its ability to remove pollutants and odours across a wide range of compounds and concentrations. A conceptual diagram of a biofilter is included below.

EPA Export 26-07-2013:03:29:06

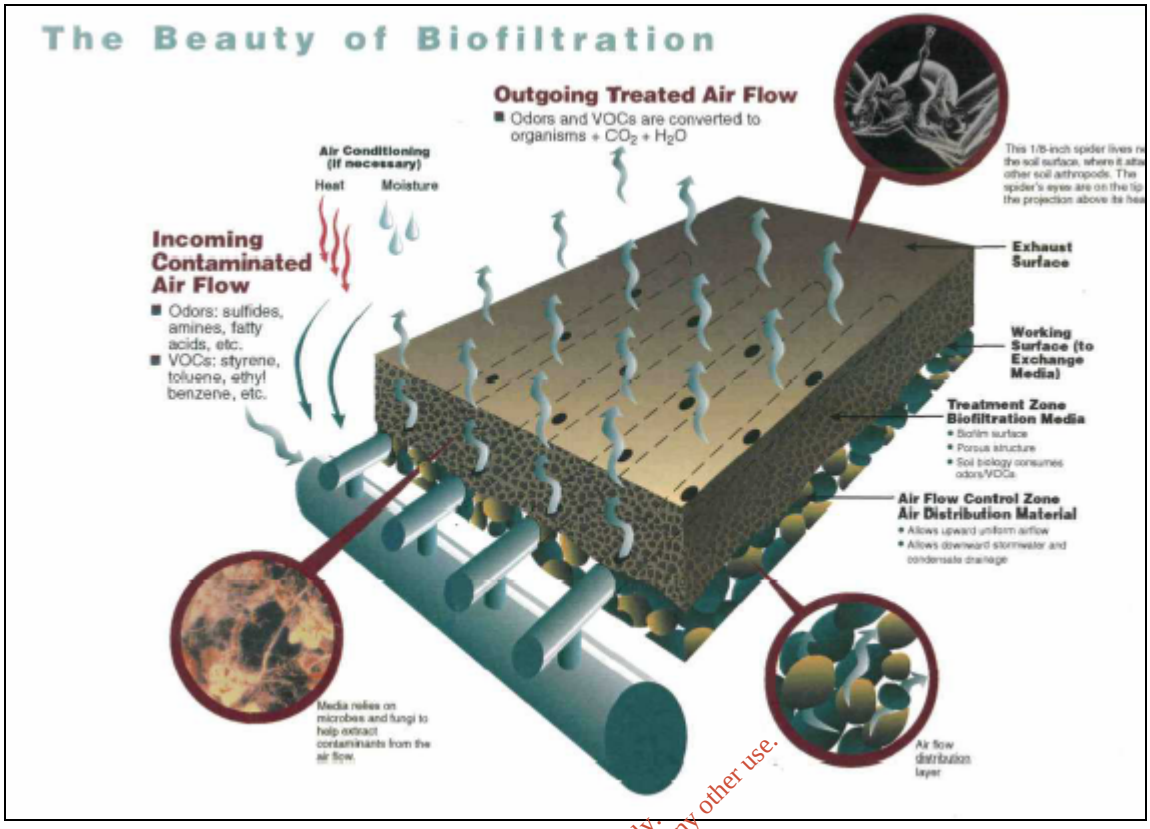


Plate 2.6 Conceptual Model of Biofiler (Source: CH2M Hill, Inc.)

Consent of copyright owner required for any other use. For inspection purposes only.

Biofiltration has been accepted in the U.S. and Europe as the "best available technology" (BAT) for odour treatment at composting facilities. When operated alone and maintained properly, they are 90-95% effective in removing odorous compounds from the composting process air. The biofilters should be monitored on a weekly basis so they remain effective in treating odours. Specifically, the biofilter exhaust will be capable of an odour output of < 500 OU/m^3. At these concentrations, dilution to a threshold of 3 OU/m^3 should be possible within 250m of the biofilter.

2.3.2.2 Biostabilisation Plant Operation

2.3.2.2.1 Overview

The process to be employed begins with the receiving of feedstock materials within an enclosed tipping area. Here materials are blended together to attain the proper balance of nutrients, moisture and porosity (air space within the mix) in order to optimise aerobic (in the presence of oxygen) microbial decomposition resulting in the production of water vapour, carbon dioxide and a humus like compost product. This is opposed to anaerobic (in the absence of oxygen) microbial decomposition that commonly takes place deep within landfills and leads to the generation of methane

EPA Export 26-07-2013:03:29:06

and foul odours. Once blended, the feedstock materials are loaded into fully enclosed concrete tunnels. Aeration within the tunnels is controlled by computer to attain and maintain temperatures of 60-70°C. These temperatures kill all potentially harmful plant pathogens and animal diseases in accordance with the European and Irish Animal By-Products Regulations to protect human health and Ireland's robust livestock industry. After 10-14 days of in-vessel processing, the materials are unloaded from the tunnels and taken into a fully enclosed curing building where the materials are stabilised under aerobic conditions for another 6-8 weeks. After this curing period, the materials are screened to harvest the soil amendment compost product while the oversized un-decomposed materials are returned to the beginning of the process and used as a bulking material in new batches of feedstocks.

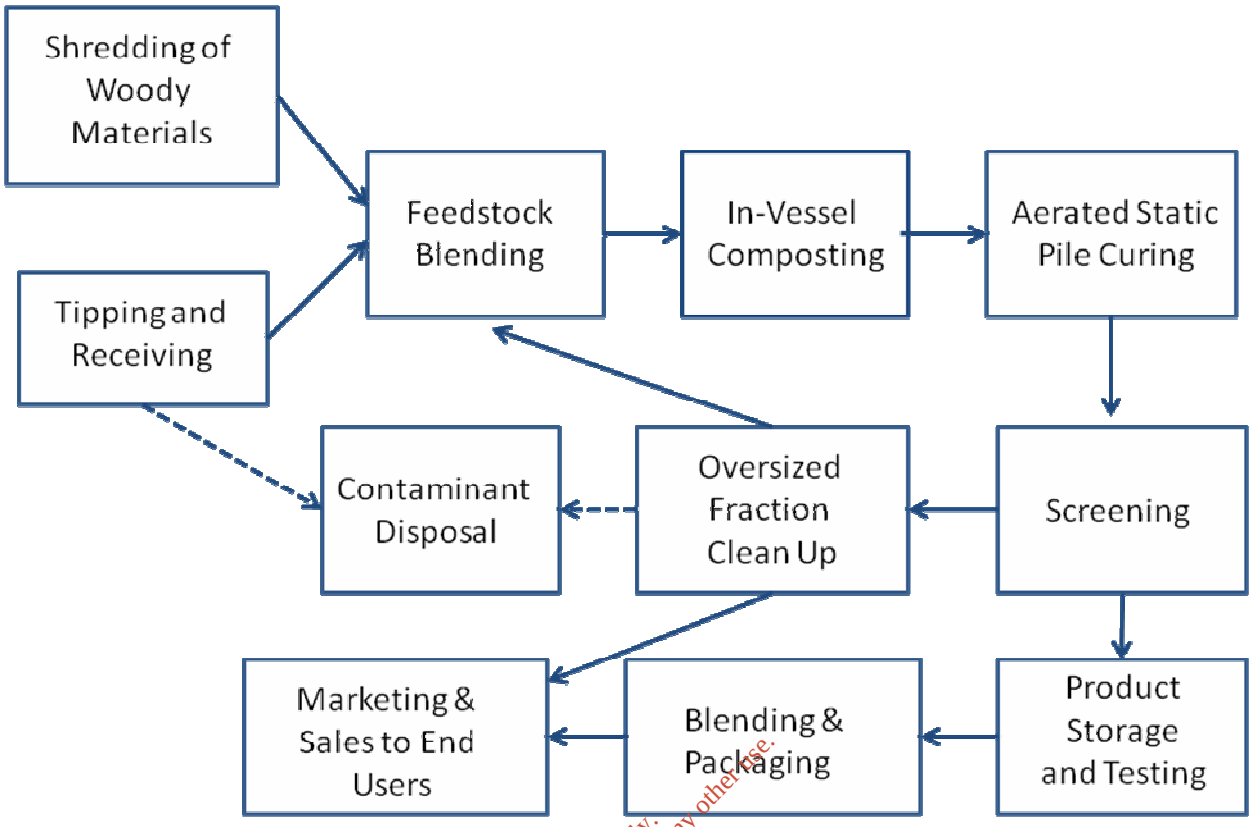
As the facility is totally enclosed, potential environmental impacts can be managed and controlled so that there will be negligible impact on the environment and nuisances can be minimised for surrounding neighbours and the community at large. All process and building air will be collected and treated to eliminate offensive odours and dust from migrating off site. Similarly any liquids generated in the tipping area or within the tunnels or curing areas will be collected and reused in the process. This eliminates any potential pollution of ground water or surface water sources under, on or near the facility. Noise is also limited as all activities will take place indoors. Finally, the enclosed nature of the facility restricts access to pests such as rodents, birds or insects so pest control measures within the facility can be effective in eliminating pest infestations or problems.

Consent of copyright owner required for any other use. For inspection purposes only.

2.3.2.2.2 Process description and process flow diagram (summary of steps)

The process flow diagram below illustrates the processing steps and material flow through the proposed bio-stabilisation and pasteurisation treatment facility. In this section, a description of the steps will be summarised, and a process schematic is included overleaf and also in Attachment 4.

EPA Export 26-07-2013:03:29:06



Summary of Processing Steps:

Consent of copyright owner required for any other use. For inspection purposes only.

(i) Shredding of Woody Materials

This step involves the shredding of woody materials, including clean timber and drop-off garden and landscape material, so that it can be used as a bulking material in the composting process. This will take place in the enclosed wood shredding area adjacent to the proposed bio- stabilisation and pasteurisation treatment plant. These materials are needed to provide porosity in the feedstock blend so that air can be easily pushed or pulled through the composting mass in the in-vessel tunnel system and in the enclosed aerated static pile curing building. After shredding, materials would be placed into a bunker within the tipping and receiving building and be ready for mixing with other feedstock materials.

(ii) Tipping and Receiving

The tipping and receiving of materials would take place within an enclosed building. All loads coming in open trucks or trailers would be inspected at the weighbridge prior to tipping to make sure that they comply with licence conditions as to the type of materials allowed for processing and to make sure that they comply with facility acceptance criteria. Once vehicles are inspected and approved for tipping, the driver is directed to the appropriate tipping bay where he can unload his collection or transfer vehicle from outside of the building through a bay door and into a submerged bunker

EPA Export 26-07-2013:03:29:06

within the tipping building. After biowaste or drop-off garden materials are tipped, a front end loader can spread materials out onto the tipping building floor so they can be quickly inspected and large contaminants such as full sacks of rubbish, large metal objects or bulky items can be removed by hand and placed into a wheelie bin or skip. After inspection and removal of large contaminants, a front-end loader is used to place materials directly into the mixer or push them back into the bunker until they can be prepared for composting.

The outside of the tipping building would contain seven curbed tipping bays along one side of the building that would allow materials to be dumped through the bay doors and into a feedstock storage bunkers below. The six bunkers would hold the following individual materials:

- Biosolids from waste water treatment plants and sludges from food processing facilities.
- Structural bulking materials: shredded wood and brushy landscape materials
- Moisture absorbing bulking materials, such as: leaves, sawdust, wheat chafe, shredded paper
- Biowaste from brown bin kerbside collection routes
- Biowaste from brown bin collection or other source separated feedstock materials, such as drop-off garden and landscape materials
- Two bunkers for mixed waste

Consent of copyright owner required for any other use.
For inspection purposes only.

The two bulking material bunkers will always be partially or completely full so that the facility will always have adequate and readily available bulking materials on hand to blend with the wetter and high nitrogen feedstocks when they arrive on site. This allows the operator to create the proper recipes for composting, balancing ingredients to obtain the right blend of nutrients, moisture and porosity for the bio-stabilisation and pasteurisation treatment process.

(iii) Feedstock Blending

Once high moisture and high nitrogen feedstocks are tipped within the building, an operator can begin to blend feedstock materials together using a dedicated mixer for this purpose. Depending on the materials to be processed, the operator will use a mixing recipe to blend the specific feedstock materials together in order to obtain the proper balance of nutrients, moisture and porosity for aerobic composting. After mixing, the blended feedstock is discharged over a wall and into a bunker where it sits temporarily until it can be loaded into the appropriate fully enclosed concrete tunnels with the use of a front end loader.

EPA Export 26-07-2013:03:29:06

(iv) In-Vessel Composting

Blended feedstock materials are then loaded into the fully enclosed concrete tunnels to the height of 2-3m high. Temperature probes are inserted into the mass to control aeration rates and/or air flow direction by an automated computer and process control system. Materials are allowed to reach the required time and temperature regime to meet Animal By-Product requirements, either 60°C for 48 hours or 70°C for an hour, depending on the type of material to be processed. After 5-7 days, the materials would be removed from the end of the tunnel within the curing building with the use of a front-end loader and placed into another tunnel for another 5-7 days, again reaching the required time and temperature requirement.

(v) Aerated Static Pile Curing

After 10-14 days of in-vessel processing, the now pasteurised materials are taken out of the opposite end of the tunnel which opens into the curing building with the use of a clean front-end loader. The material is then placed into an aerated curing bunker for 2 weeks of continued composting and stabilisation. The material is then turned into a new bunker with the use of a front end loader and is then allowed to further stabilise for another 1-2 weeks. Depending on the type of material to be processed and its desired end use, the material could be turned once more and allowed to mature further for 2-4 weeks in an aerated aging bunker as shown on the facility plan. Below are the turning regimes for the low, medium and high quality products to be processed by the facility:

For inspection purposes only.
Consent of copyright owner required for any other use.

- *Mixed waste fines producing a low quality product*: placed in an aerated bunker for two weeks and turned once for another two weeks of processing into another aerated curing bunker. After 4 weeks of processing, two bunkers of mixed waste fines materials will be consolidated into one aerated aging bunker for 2-4 weeks of maturation. Total curing time will depend on the pending EPA standard for stability of biostabilised waste (6-8 weeks of total curing time).

- *Biosolids and sludges producing a medium quality product*: placed in an aerated bunker for two weeks. If the compost is used as an agricultural fertiliser, the material is turned once into another aerated bunker and allowed to compost for an additional one to two weeks (3-4 weeks of total curing time). If the compost is to be used for topsoil production, the material is placed into an aerated curing bunker for two weeks and turned into another aerated curing bunker for two weeks. After four weeks of processing, two bunkers of biosolids/sludges will be consolidated into one aerated aging bunker for another 2-4 weeks of maturation. (6-8 weeks of total curing time).

EPA Export 26-07-2013:03:29:06

- *Biowaste from brown bins and other source separated biodegradable materials producing a high quality product*: placed in a curing bunker for two weeks and turned into another curing bunker for two weeks. After four weeks of processing, two bunkers of biowaste will be consolidated into one aerated aging bunker for another 4 weeks of maturation. (8 weeks of total curing time).

(vi) Screening

Once materials are stabilised inside the enclosed aerated static pile curing building, they are ready for screening. Screening will take place within the enclosed curing building to harvest the compost product. The undersized material will be placed into one of three product storage bunkers outside the curing building: one for low quality compost, one for medium quality compost and another for high quality compost depending on the materials used to make the compost product: mixed waste fines, biosolids or source separated biodegradable materials respectively. The oversized materials will undergo some mechanical processing to remove physical contaminants, mainly film plastic and the cleaned up materials will then be placed into the structural bulking material bunker within the tipping and receiving building. If there is demand, the overs can be cleaned up further via screening using a 40-50mm screen and/or manual picking of contaminants to create a clean mulch product and sold.

Consent of copyright owner required for any other use. For inspection purposes only.

(vii) Product Storage and Testing

After screening, the undersized compost product is placed and accumulated into one of three final product storage bunkers within the curing building depending on its quality (low, medium or high). At this time and as required by the conditions within the EPA license for frequency of product sampling and laboratory analysis, a composite sample would be gathered from the product storage bunker and sent to an independent laboratory for analysis, testing the product for pathogens, stability, heavy metals and/or physical impurities. Given current EPA guidelines for frequency of testing, sampling would occur every 1,000 tonnes of compost product produced. With the proposed facility processing 10,000-15,000 tonnes per year and assuming a 50% reduction in weight, Clean (Ireland) Refuse and Recycling Ltd. would produce 5,000-8,000 tonnes per year of product. Therefore, testing would occur every 6-10 weeks depending on the throughput of the facility and the season of the year.

(viii) Blending and Packaging

Depending on the quality of the compost and its intended use, the compost product could be immediately moved off site to end users or it could be blended with other materials to make topsoil, potting mixes or organic fertiliser. Depending on what is

EPA Export 26-07-2013:03:29:06

being produced, a mixer, trommel screen or front-end loader could be used to blend ingredients together to create value-added compost-based products. These could be stored outside in bunkers or piles and in the wetter winter season could be covered with tarpaulins to keep materials from getting too wet. Any and all products could be packaged in small paper or plastic bags for retail distribution or sale from public or privately operated civic amenity sites. Other composting facilities in Ireland have had great success with loading compost-based products into 1-2 cubic meter plastic mesh bags that then can be delivered to landscaping jobs or construction sites (these are the same bags that Clean (Ireland) Refuse and Recycling Ltd. uses to collect various waste materials from contractors, landscapers or anyone needing disposal services for quantities that are more than what wheelie bins would hold and less than the capacity of a skip).

(ix) Marketing & Sale to End Users

Clean (Ireland) Refuse and Recycling Ltd. can produce a variety of different compost-based products including soil amendments or improvers, mulches, topdressings, topsoils or growing medium. As a marketing driven organisation, Clean (Ireland) Refuse and Recycling Ltd. will work with potential local users to produce products that they want to buy. So that means that the facility will create products that meet local customer's needs and specifications. Therefore, marketing and sales activities and demand from customers will drive the types of products made by the facility. As various products are sold, Clean (Ireland) Refuse and Recycling Ltd. will gather ingredients from its inventory to fill market demand. These orders will be tracked and weighed before the load leaves the facility whether the customer comes and picks them up from the Clean (Ireland) Refuse and Recycling Ltd. site or whether Clean (Ireland) Refuse and Recycling Ltd. uses one of its vehicles to deliver the product to the customer.

Consent of copyright owner required for any other use. For inspection purposes only.

(x) Oversized Fraction Clean Up

Backing up a bit on the flow chart at the screening stage, oversized materials (overs) are generated during screening. These consist of mainly undecomposed wood chips (structural bulking material) and contaminants, mainly plastic film. As a way to clean up the overs so they can be reused in the beginning of the process as a structural bulking material and inoculant, an air classifier can be attached to the overs discharge belt to suck or blow plastic film from the overs stream and collected in a skip or meshed cage. If the overs are to be sold as a mulch or fuel, they would require further cleaning to remove heavier contaminants. This can be accomplished by using a 40-50mm screen and/or a manual picking station on the discharge conveyor to remove such things as metal cans and plastic bottles.

EPA Export 26-07-2013:03:29:06

(xi) Contaminant Disposal

The contaminants removed from the tipping area and from the cleaning up the overs would then be accumulated with other residual waste from the entire Clean (Ireland) Refuse and Recycling Ltd. site and loaded into a transfer trailer for transport to a licensed landfill disposal facility.

Standard operating procedures SOP CIR20-128 is included in Attachment 9 for the operation of the Biostabilisation Plant.

2.3.2.2.3 Proposed Waste Streams: Types and Quantities of Materials

The goal of the facility is to produce as much high-quality products as possible given the variety of feedstocks to be accepted. The facility could potentially create three different outputs: one from mixed waste fines producing a low-quality product, a second from predominantly biosolids producing a medium-quality product, and a third from clean source separated biodegradable materials producing a high-quality product. In all cases, there are certain materials that will **not** be accepted by the bio-stabilisation and pasteurisation treatment facility and include the following general categories of feedstocks.:

For inspection purposes only.
Consent of copyright owner required for any other use.

- non-biodegradable waste such as metal, glass, plastic, rocks, drywall, vinyl, carpets, etc.
- mixed biodegradable and non-biodegradable products/packaging such as nappies, tetrapak packaging, toys, toiletries, textiles, or shoes.
- Category 1 or 2 animal by-products
- hazardous waste, including pharmaceutical waste or sludges
- sludges or biosolids with high concentrations of heavy metal or toxic chemicals
- painted or treated wood

The three main categories of materials to be composted by the proposed facility consist of mixed waste "fines," biosolids from acceptable sources, and source-separated or sorted biodegradable waste materials and include waste types and codes as defined by the European Waste Catalogue (EWC) as adopted by the European Commission in 2001. A list of these wastes in detailed in Attachment 5.

Certain items in this list in Attachment 5 may never be collected and processed by Clean (Ireland) Refuse and Recycling Ltd. However, a comprehensive list of materials has been submitted to provide Clean (Ireland) Refuse and Recycling Ltd. the flexibility to fill the facility to capacity with potentially available feedstocks for

EPA Export 26-07-2013:03:29:06

economic reasons. If Clean (Ireland) Refuse and Recycling Ltd. builds a plant for 15,000 tonnes per year and does not use this capacity, then the operation will not be economically sustainable. The types and mix of materials to be composted may evolve over time and throughout the year, for example, the amount of garden, fruit and vegetable waste varies according to the season. New sources of biodegradable materials may arise that are compatible with the process and the types of materials being processed by the facility. In order to guarantee a successful composting system and a good quality end-product, a waste acceptance procedure to control incoming biodegradable material will be employed at the facility and is described in another section within this document. In all cases, the facility will store adequate bulking material to blend with high nitrogen and/or high moisture materials such as catering waste, biowaste and biosolids as they come in for processing. These bulking materials include the following materials:

Drop-Off Green Waste from Local Authority Civic Amenity Sites

Garden and landscape materials can be used as a structural material in the composting process and provide energy to the mix in winter time when brown bins are mostly filled with food. This material consists of shrub trimmings, tree prunings, leaves, grass, weeds and tree bark which will be shredded as needed prior to mixing with other clean feedstock materials in the feedstock preparation stage.

Consent of copyright owner required for any other use. For inspection purposes only.

Clean Wood Waste

Shredded pallets, chipped timber, sawdust and bark are also good bulking materials as well as a good structural material. These may be sourced from local saw mills; furniture, window and door manufacturers; or from Clean (Ireland) Refuse and Recycling Ltd.'s existing C & D or commercial waste recovery operations.

Paper

Paper of all sorts makes a good bulking material, especially to absorb moisture and provide readily available carbon to the composting mix. To be used effectively in composting, the paper needs to be shredded. Non-recyclable paper such as tissue paper, non-coated paper plates and cups and mixed waste paper are good sources of bulking materials and can help increase diversion of these materials from landfill disposal.

Straw or Hay

Old straw or hay harvested from nearby farms can be used if necessary to provide a suitable bulking material when other bulking materials from the waste stream cannot be sourced or are not available.

EPA Export 26-07-2013:03:29:07

2.3.2.2 Extension of existing Processing Buildings

The area at the south-west of the processing buildings is currently used for C&D waste storage and C&D waste processing. C&D waste is sorted using a picking line and separation of metals. The C&D waste is passed through a trommel and the fines are collected and transported to landfill for disposal. There is currently no cover over the C&D waste storage area.

The area at the south-east of the processing buildings is used for the shredding of wood products, which is currently taking place at the facility. The wood waste is sourced from existing waste streams that enter the site and the shredding activity is additional to the processing of this waste stream where the final product is wood chip. The activity currently takes place on a dedicated hardstanding area. Any contamination is removed from the wood loads using mechanical sorting. Steel is removed with a steel magnet.

The area of the proposed building for C&D storage and timber shredding is 2,297m^2 Site Layout Plan Ref C(IRL)WL-02 in Attachment 3. The building fabric will be a two metre concrete wall completed to roof height with metal cladding as with the existing processing buildings

Consent of copyright owner required for any other use. For inspection purposes only.

The south west side will be used for C&D waste storage. The apex height of the building at the south west side will be 10.23m which will be inline with the existing roof height of the adjacent processing building on the west. The housing of C&D waste will eliminate contact between rainwater and the stockpiled inert C& D waste while in storage at the facility.

The south east side will be used for timber shredding activity. The height of the building at the south east side will be 10.3m which will be inline with the existing roof height of the adjacent processing building on the east. All of the processes associated with timber shredding including storage and sorting, loading hopper, conveyor belt, shredding and storage of shredded timber (wood chip) will be enclosed in the structure. The enclosure of this process will eliminate contact between rainwater and the waste wood products during processing and storage at the facility. By erecting a building to enclose the timber shredder, the noise from the process will be reduced significantly.

2.3.2.3 Relocation of glass bunkers

EPA Export 26-07-2013:03:29:07

The existing development consists of three glass bunkers located at the west side (south end) of the Clean Ireland Refuse & Recycling Ltd. site. Roofing over stored waste glass eliminates surface water runoff from the waste glass during rainfall. The existing glass bunker area (172m^2) is indicated on Site Layout Plan Ref C(IRL)WL-02 in Attachment 3. There is currently no dedicated bin wash area on the site. In order to provide surface area for the development of the Biostabilisation Plant, these glass bunkers will be relocated to the skip storage area as indicated on Drawing C(IRL)WL-02 in Attachment 3.

2.3.2.4 Provision of End of Life Vehicle Unit

A structure will be introduced at the western section of the facility for the purpose of processing End of Life Vehicle Unit and located as indicated on Drawing C(IRL)WL-02 in Attachment 3. This process will involved depolluting the vehicle prior to disassembling the body of the vehicle. All parts will be recycled by incorporating the material into the existing segregation at the facility. Independent bunding will be put in place for the storage of engine oils, lead acid batteries and engine parts retaining grease or other hydrocarbons. Scrap metals will be removed to designated scrap metal area at the facility.

Consent of copyright owner required for any other use. For inspection purposes only.

2.3.2.5 Provision of Fuel/Oil Bunded Storage Unit

The existing fuel storage area will be replaced by a portable 60,000 litre fuel storage portable container will a bund capacity of 110%. All hydrocarbons currently stored in the existing fuel storage will be relocated to this unit. It is proposed to locate all fuel storage to this area as shown in Drawing C(IRL)WL-02 in Attachment 3. The fabric will be plastic and the tanks will be covered and the unit is portable.

2.3.2.5 Wheelie Bin/Truck Wash

There is a two phase plan for this activity. Firstly, a proposed area for a wheelie bin, truck and wheel wash area will include a leachate holding tank and will located at the east perimeter to the front of the north face of the waste processing buildings relatively close to the weighbridge as shown on Site Layout Plan Ref C(IRL)WL-02 in Attachment 3. A contained area for wheelie bin and truck wash activities will minimise the interaction with the hardstanded area across the site and reduce the leachate production and the potential for entering the surface water drains. There water supply for the washing activities may be sourced from the rainwater harvested on site which will in turn reduce the volume of surface water diverted from the site. There will be no abstraction from surface waters.

EPA Export 26-07-2013:03:29:07

It is estimated that the volume of leachate generated per week from wheelie bin washing would be 2.5m^3 (based on power washing a maximum of 100 wheelie bins per day using 4-5 litres of water per bin). As there is no public sewer servicing on the site, all washings will be contained in a sump and pumped to an over ground leachate holding tank with a capacity of c.6m^3. It is proposed to relocate the truck washing activity to this central location and washings will be collected and managed as per the wheelie bin washing process. Leachate will be collected and then removed from the facility by a tanker and disposed of appropriately by an approved waste contractor.

Secondly, on completion of the Biostabilisation Plant, all wheelie bin washing will take place in the tipping building, where washings can be recycled into the compostable waste and the activity will no longer take place at the north of the site as described above. The water supply will be taken three 30m^3 rain harvesters at the southwest of the facility collecting roof water from the Biostabilisation Plant. This is part of the leachate management program for the facility.

2.3.2.6 Wheel Wash

The facility is proposing to install a Speedwash Automatic Underbody & Wheel Wash. This will include 1 No. Single Boom Underbody & Wheel Wash System comprising of Stainless Steel underfloor boom with 12 no. Spray jets fitted at strategic positions to wash underbody and wheels of trucks as they pass over it. 2 No. Side booms each with 3 spray jets to wash outside of wheels and chassis. The main boom and both side booms are rotated through an angle of 90° by a geared motor to give better cleaning effect. The booms are mounted on a heavy duty mild steel frame, galvanised dipped complete with sealed bearings, swivel, control linkage and associated fittings. All of the above equipment is located in an underfloor duct on washbay with heavy duty galvanised gratings on top.

Consent of copyright owner required for any other use.
For inspection purposes only.

Pump Set

1 No. Grundfos CR32-9 Multistage Pump with 18.5kw close coupled motor, 3 phase 380 volts complete with BSP pump flanges, stainless steel ballvalve, solenoid valve, water filter, stainless steel pipework and fittings. The Pump will deliver up to 600 litres per minute at 150 P.S.I.

Water Supply Tank

1 No. 5000L Polyproplene Water Supply Tank complete with lid, 2" stainless steel ball valve, 2" ballcock & float, low level switch and associated fittings.

EPA Export 26-07-2013:03:29:07

Electrical Control Panel

1 No. Electrical Control Panel comprising of contactors, overload, MCB, panel isolator, transformer, relay, timer, loop sensor control unit, start/stop buttons, run & trip lights all housed in an IP65 enclosure.

Automatic Operation

The machine is controlled by under-floor loop sensors located at entrance to the wash, which sends signals to control panel to give ignition. When the truck leaves the washbay the system times out and shuts down.

2.3.2.7 Biomass Recovery Plant

In order to meet the energy demands of the facility, Clean (Irl) Refuse & Recycling is proposing to generate their own renewable energy to meet the site's need. The proposed improvement invests considerable capital into a small on-site biomass renewable energy generation system to produce all or part of the electricity and heat needed to operate the expanded Clean Ireland facility. The gasification system takes super clean and dry wood that the site is currently producing and coverts it into a Hydrogen rich "syngas" that fuels an engine/generator. It simply substitutes a carbon neutral renewable energy system for the non-renewable diesel one currently being used on site.

For inspection purposes only.
Consent of copyright owner required for any other use.

Although specific system vendors for the Biostabilisation Plant or biomass renewable energy system have not been chosen at this stage, Clean Ireland has taken considerable time and effort to choose the most appropriate technologies for the scale of its operation and size/location of its site. In fact, the company hired an independent engineering company to develop the conceptual design for the fully enclosed Biostabilisation Plant based on its decision to install a batch, concrete tunnel in-vessel system followed by indoor aerated curing. Although the engineer was tasked to size components properly, the design or size of facility components may change slightly after a vendor is chosen and a final design is developed. Likewise, the size and shape of the gasification system may change depending on the size of the system installed and how much the company can afford to invest. A small 250kW system could take up to 200 square meters but a 1MW system could be 500-700 square meters in size. Therefore, the final designs for both will be submitted as a part of a Specified Engineering Works proposal for final approval by relevant planning and licensing authorities prior to construction.

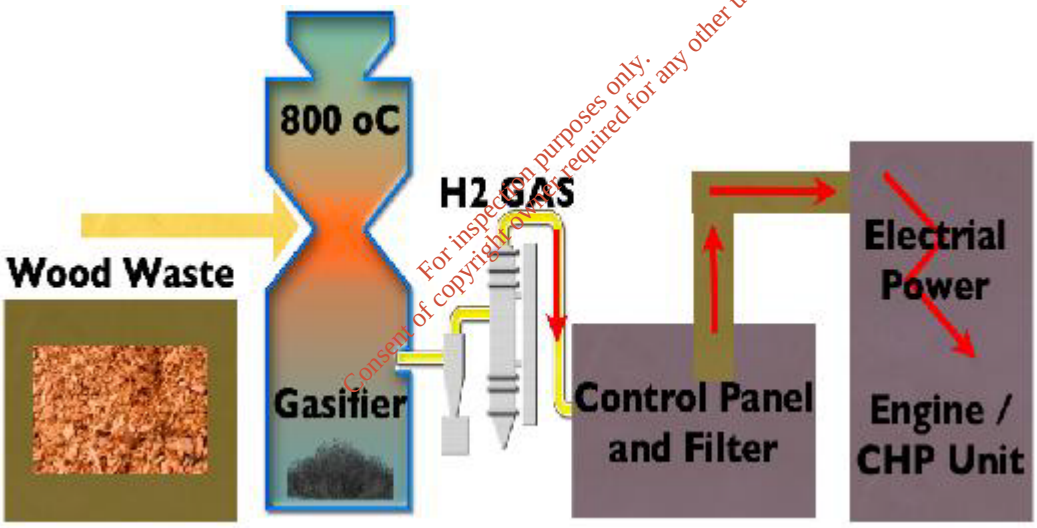
Overall Description of the Renewable Energy Biomass System

EPA Export 26-07-2013:03:29:07

Gasification is not a new process or technology and was even used in the early 1900's to power automobiles. The process is quite simple. Carbonaceous materials (coal, wood, paper, etc.) are heated up within an enclosed system under controlled conditions to produce carbon monoxide and hydrogen. This "syngas" is then burned in an engine attached to a generator to produce electricity, heat, carbon dioxide and water. A carbon rich char or charcoal by-product is also produced which can be used as a fertiliser or soil amendment. This process is shown below:

Gasification Process

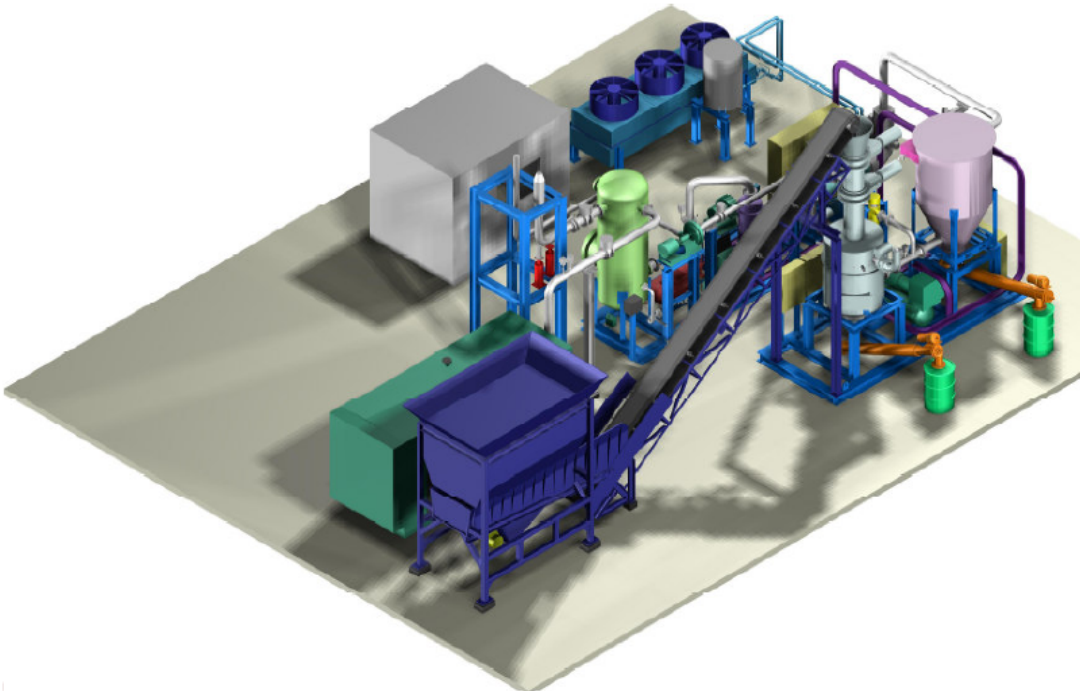
- Wood is preheated to reduce its moisture content.
- The wood feedstock is fed into a chamber and gasified with oxygen at a high temperature.
- This process creates syngas as well as a charcoal by-product.
- The syngas is then pumped through a filtration system into an engine that produces electricity.



For inspection purposes only.
Consent of copyright owner required for any other use.

A gasification plant comprises of a gasification chamber, synthetic gas filter and combined heat and power or CHP plants. A typical layout of one of these plants is shown below:

EPA Export 26-07-2013:03:29:07



This small 250kW unit fits within a 200 square meter area. What follows is an actual photograph of a small 270kW system in Germany.

Consent of copyright owner required for any other use.
For inspection purposes only.

Depending on the amount of feedstock needed, space and cost, Clean Ireland is looking to install a system to generate between 250kW and 1MW.

EPA Export 26-07-2013:03:29:07

The Biomass Recovery Plant will be located at the south(east) of the facility as shown in site layout plan C(IRL)WL-02 in Attachment 3. The area of the proposed plant will be 500m^2. An example of the design of the system is contained in Attachment 7.

2.3.2.8 Hardstanding skip storage area

Currently, an area at the north side of the roadway is not enclosed on the main processing site as it is located in the field opposite to Clean Ireland Refuse & Recycling Ltd. facility, where the employee car park is situated. The proposed area as shown Site Layout Plan Ref C(IRL)WL-02 in Attachment 3 has not had any previous development or use other than agricultural. The adjacent Clean Ireland Refuse & Recycling Ltd. car park has a capacity for 15 cars for Clean Ireland Refuse & Recycling Ltd. employees. The car park is gravel surfaced. Surface water drains through this surface and into a silt oil interceptor to the outfall.

The proposed area covers an area of c.0.4ha directly north of this car park. It is intended to hardstand the proposed storage area in two phases, Phase 1 (1,302 m^2) and Phase 2 (2,968 m^2).
Access to the storage area will be through the southern entrance of the car park. The car park entrance will be upgraded and widened. An entrance will be constructed to the storage area at the north perimeter of the car park which will result in the loss of two car parking spaces. The entrance sight lines will be the same as the existing car park sightlines. The storage area will be primarily used to store empty skips and will be hardstanded in the two phases as described above. It is estimated that the area will be able to store up to 50 skips. Skip trucks entering the storage area will be infrequent and this traffic is estimated at approx. 20 skip truck movements per week; these numbers are already accounted for in the traffic movements of the facility.

Consent of copyright owner required for any other use. For inspection purposes only.

Screening will be put in place on the boundary of the skip storage area in the form of earthen berms c.2m high which will be planted with natural vegetation. This screening will eliminate any visual impact from the skips that will be stored in this area (heights vary from 1.2m to 2.4m). Additionally, the earthen berms will also screen the main facility from the parallel roadway that runs to the north from Cree to Doonbeg. The proposed storage area will be made secure with a lock and gate when the Clean Ireland Refuse & Recycling Ltd. facility is closed. Skip movements would take place during proposed operational hours only. Surface runoff will be directed to the facility surface water drainage channel, prior to the silt/oil interceptor, and discharged to the field which is current practice under Waste Permit 00207/WPT/CL and Licence to Discharge W.P.162. The capacity of the bypass separator (Model NSB 8) is 72l/sec (62,208l/day). Based on 30-year rainfall averages, the greatest

EPA Export 26-07-2013:03:29:07

daily rainfall for the entire storage area including Phase 1 and Phase 2 during the wettest months, could be up be 215m^3/day. The capacity of the existing bypass separator is sufficient to handle these volumes. However, the drainage will be addressed as part of phase 2 and a second silt interceptor may be installed to serve the hardstanding area, which will be sloped in a northerly direction.

2.3.3 Construction Phase - General

The site development works and construction sequence for the proposed development will, in general, comprise the following main steps. In turn, such phases will generate construction traffic on a temporary basis:

- Stripping of field and overlaying with hardcore
- Construction of earthen berms skip storage area
- Hardstanding Phase 1 of skip storage area
- Construction of extensions to processing buildings
- Construction of glass bunkers
- Construction of End of Life Vehicle Unit
- Installation of wheel/truck/bin wash and leachate holding tank
- Excavation to accommodate installation of underground leachate holding tanks
- Construction of Biostabilisation Plant and Biofilter
- Construction of Biomass Recovery Plant
- Hardstanding Phase 2 of skip storage area
- Ongoing hardstanding of the hardcore areas

For inspection purposes only.
Consent of copyright owner required for any other use.

(i) ***Time of Year, Duration & Phasing of Operations***

The development of the site will take place during the five years following granting planning permission, should it be granted. A planning application to the local authority will be made subsequent to the completion of the EIS and submission of a Waste Licence Application. It is envisaged that, due to the different aspects of the development, construction will take place at the site during approximately five phases. The time of year that the construction phases will be carried out has not been decided, however all efforts will be made as to not create a significant increase in traffic movements on the local road networks and avoid disturbance for local residents. Hours of work for all parts of the construction phase of the development will conform to the Health and Safety at Work Regulations. The haul routes of the construction materials will be defined by Clean (Irl) Refuse & Recycling Ltd. in agreement with the sub-contractors or suppliers.

EPA Export 26-07-2013:03:29:07

(ii) *Construction Techniques*

Buildings to be constructed in the development of the site will be prefabricated in sections and will arrive to site where they are assembled insitu. All floors within the buildings will be hardstanded over existing hardcore with concrete and designed such that gradients will direct the flow of any water into the leachate management system.

It will be necessary to cut back into the earthen berm at the south end of the site to make available some of the footprint. Any area exposed will be overlaid with hardcore (1-2ft) and where areas surrounding the perimeter of the buildings will incorporated into the existing earthen berms.

The skip storage area, which was previously a Greenfield site, will be firstly prepared with hardcore (1-2ft). A final impervious layer of concrete will be applied to the area firstly in Phase 1 and then Phase 2. The gradient will be designed such that the surface water from will flow in the direction of the existing silt/oil interceptor located at the north end of the site. A hardstanded area plan C(IRL)WL-23 is included in Attachment 3.

For inspection purposes only.
Consent of copyright owner required for any other use.

(iii) ***Construction Traffic & Access***

Construction material which will have to be transported to the site (i.e. the construction of processing buildings, glass bunker/bin wash, installation of leachate recycling tanks, and concrete will involve the following plant and vehicles:

- HGV for transport of prefabricated frames
- Cranes and hoists
- Concrete trucks
- HGV or lorry for transport of tanks
- HGV for transport of Biostabilisation (invessel tunnels all built on site)

The Clean (Ireland) Refuse & Recycling Ltd. site can be accessed via two possible roadways as detailed above. However, it is likely that the construction traffic will come from the contractors or builder providers in the east and will access the site either via the Kilrush to Cree Road R483, or from Ennis on the N68 via the Kilmihill Road (R484). Any soil, hardcore or bedrock that will be excavated during the construction will be relocated around the site to build up berming at the boundaries. The number of workers and the number of HGV's accessing the site will vary throughout the construction period. It is anticipated that no more than 5 contractors will be

EPA Export 26-07-2013:03:29:07

present on site during the construction phase of the development t any given time. HGV's will arrive solely and infrequently during the construction period.

(iv) ***Noise, Vibration & Dust***

Noise and Vibration

During the various phases of construction, noise may be generated due to the use of construction equipment. Construction activities will be limited to normal day time working hours 08.00 to 1700 on Monday to Friday and 800 to 1300 on Satudays. These activities will include:

- Heavy goods vehicles delivering materials.
- Earth moving plant, such as excavators, bulldozers and dump trucks.
- Concrete plant including mixers.
- Lifting equipment, such as cranes and hoists.
- Miscellaneous equipment, including compressors, hand tools and generators.

For inspection purposes only.
Consent of copyright owner required for any other use.

Dust

Dust emissions arising from the site during the construction phase are likely to result from the following activities:

- Site excavations (removal of spoil, site stripping and earthworks)
- Movement of construction traffic
- Concreting operations

To minimise the potential for dust nuisance from the construction on the site and from construction traffic using public roads, good site practices will be adopted as follows:

- On site speed restrictions (<10 kmph) will be implemented in order to prevent the unnecessary generation of fugitive dust emissions.
- Wetting of internal roads and made surfaces as required (during periods of dry weather)
- Wheel washing facilities for vehicles leaving the site in order to prevent transportation of dust from the construction site.

EPA Export 26-07-2013:03:29:07

2.3.4 Operation – General

(i) ***Employment***

The existing work force will be increased as a result of the proposed development of the site by two permanent employees.

(ii) ***Landscaping***

The existing landscaping at the boundaries will be maintained. Landscaping will be applied to the earthen berms at the skip storage area and the southern boundary

(iii) ***Water Discharge/Effluent Control Measures***

Wastewaters generated at the site can be divided into the following categories:

- Domestic Wastewater
- Storm Water (surface water run-off from hardstanding areas following a rainfall event)

For inspection purposes only.
Consent of copyright owner required for any other use.

Domestic Wastewater

The existing onsite Puraflo and mini platinum wastewater treatment system with a P.E. 19 will be sufficient to support the site development, during construction and operation phase.

Storm Water

There will be no alteration to the existing surface water management plan for the site. Further surface water management will be included to accommodate storm water flows from the skip storage area: phase 1 will be incorporated into the existing drainage for the north of the site and for employee carpark. Phase two is a larger area and may have a second interceptor installed if deemed necessary. The proposed surface water drainage plan drawing C(IRL)WL-19 is included in Attachment 3.

(iv) ***Water Requirement & Supply***

The proposed development does not require large volumes of water during waste processing operations.However, water is required for to carry out the flowing activities on site:

- Biostabilisation Plant
- Biomass Recovery Plant
- Domestic·services
- Wheelie bin/truck washing

EPA Export 26-07-2013:03:29:07

- Wheel wash in Biostabilisation Plant
- Wheel wash
- Dust spraying during dry periods
- Fire fighting

Fire Hydrant

There is no fire hydrant at the facility or mains water. Clean firewater is retained in a firetruck for the facility with a capacity of 800 litres.

Drinking Water

Drinking water is supplied from either the on-site bored well, which is passed through a filtration system. Alternatively water is sourced from the Drumehilly-Cree group water scheme.

Rainwater Harvesting

Rain harvesting is currently in practice from roof runoff into a tanker at the west face of the processing building. This water provides flushing water for the toilets. Also a $30m^3$ tank is designated for firefighting water. Three $30m^3$ tanks will collect roof rain from the Biostabilisation Plant for composting and wheelie bin activities.

Consent of copyright owner required for any other use. For inspection purposes only.

(v) ***Atmospheric Emissions***

The principal pollutants associated with emissions from traffic and the biomass gasification plant includes the following:

- Sulphur Dioxide (SO_2)
- Nitrogen Dioxide (NO_2)
- Carbon Monoxide (CO)
- Volatile Organic Compounds (BTEX)
- PM_{10}
- Lead

(vi) ***Noise Creation***

There are several sources of noise generation on site. The movement of waste vehicles around the facility cannot be avoided, and due care will be given to avoid unnecessary revving of the engines. Operation of the. C&D trommel and timber shredder will be intermittent. Tipping of glass in the skip storage area will be infrequent. All the proposed activities will be enclosed as part of the improvements to the facility.

(vii) ***Telecommunication and Electricity Supply***

EPA Export 26-07-2013:03:29:07

Telecommunication is already in place. ESB substation when completed will have an import·capacity·of·420·kva. The energy produced from the Biomass Recovery Plant will meet the majority of the site electricity requirements.

(viii) ***Waste Production, Waste Disposal & Litter Control Measures***

General domestic waste arising from administration offices will be incorporated to the waste segregation and recycling processes on site. Existing yard activities procedure CIR20-100 in Attachment 9 in place to deal with litter on site and on local road roads.

(ix) ***Health and Safety Procedures/Protocols***

Health & Safety procedures/protocols will be followed as detailed in yard activities procedure CIR20-100 in Attachment 9.

(x) ***Maintenance***

Maintenance of on site processing equipment will be carried out to ensure it is working efficiently. Maintenance will be scheduled at regular intervals. In particular, the in-vessel biostabilisation plant will be regularly maintained to ensure the process is controlled. Buildings will be subjected to normal maintenance and upkeep on the site.

For inspection purposes only.
Consent of copyright owner required for any other use.

(xi) ***Fencing/Site Boundary***

The existing fencing on the main part of the site will remain as is, and the dwelling wall and entrance way will be enclosed with a boundary inline with that of the existing boundary.

(xii) ***Accident and Emergency Plans***

The existing emergency response procedure in place defines the appropriate actions to be taken in response to potential emergency situations (e.g. fire) occurring at the site and including environmental accidents and or emergencies. These measures will be designed to:

- Ensure maximum protection for on-site personnel
- Ensure that a significant hazard to the general public is prevented
- Minimise impact on the receiving environment
- Reduce impact on site operations
- Implementation of emergency procedures will involve appropriate staff training. The emergency procedures are followed by all personnel (including visitors) on site

EPA Export 26-07-2013:03:29:07